EVALUATING AND IMPROVING LIFE IN THE THIRD AGE

CORNELIA RADA
VALENTINA MARINESCU
(Coordinators)

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EDITURA UNIVERSITARĂ
Bucureşti

Colecţia PSIHOLOGIE

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Editură recunoscută de Consiliul Naţional al Cercetării Ştiinţifice (C.N.C.S.) şi inclusă de Consiliul Naţional de Atestare a Titlurilor, Diplomelor şi Certificatelor Universitare (C.N.A.T.D.C.U.) în categoria editurilor de prestigiu recunoscut.

Descrierea CIP a Bibliotecii Naţionale a României
Evaluating and improving life in the third age / coord.:
Cornelia Rada, Valentina Marinescu. - Bucureşti : Editura Universitară, 2021
Conţine bibliografie
ISBN 978-606-28-1344-4

I. Rada, Cornelia (coord.)
II. Marinescu, Valentina (coord.)

159.9

DOI: (Digital Object Identifier): 10.5682/9786062813444

Editura Universitară
Editor: Vasile Muscalu
B-dul. N. Bălcescu nr. 27-33, Sector 1, Bucureşti
Tel.: 021.315.32.47
www.editurauniversitara.ro
e-mail: redactia@editurauniversitara.ro

Distribuţie: tel.: 021.315.32.47 / 0745 200 718/ 0745 200 357
comenzi@editurauniversitara.ro
www.editurauniversitara.ro

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FOREWORD

Dedicating a volume to the elderly people and contributing to target the know how on the topic of increasing life expectancy, as well as the quality of life of older adults, is a compliment to life and to its survivors. Because the seniors are the ones who have demonstrated that they master the art of living and that they have understood the survival lesson.

According to the World Health Organization, the number of people aged 60 and over in 2000 was 605 million worldwide; it is expected to grow to about 2 billion by 2050 (WHO, Aging and life course).

In Romania, starting with January 1st, 2000, the elderly population outnumbered the young population and the phenomenon gradually increased so that on January 1st, 2012, the share of the elderly population (65 and over) exceeded the share of the young population (0-14 years) (National Council of the Elderly, 2014). The average life expectancy increased from 70.53 years in 2000 to 74.26 years (70.72 years for men 77.86 years for women) in 2012 (National Institute of Statistics, 2014).

Life expectancy at birth in 2014 in EU-28 member countries was 83.6 years for men and 78.1 for women. In Romania it was by 4.9 years lower for women and by 6.7 years lower for men. Out of the life expectancy of 18.02 years for 65-year-old women, 5.7 years are expected to be lived in good health; as for the 65-year-old men, out of 14.68 years of life expectancy, 5.9 years are expected to be lived in good health (National Institute of Statistics, 2016).

As the proportion of the elderly increases throughout the world and at the same time the life expectancy increases, the question arises as to how the aging can be accompanied by a long period of health, a social employment, a prolonged productivity and a feeling of well-being. In these circumstances, the multidisciplinary study of the elderly population in Romania appears to be useful.

Three components characterize successful aging: 1. the absence of disease and disability, 2. high cognitive and physical functioning, and 3. social and productive involvement (Strawbridge, Wallhagen & Cohen, 2002).

In the last 20 years, psychogerontological evaluation and psychotherapy in the elderly have increased also in Romania.

The issues of prolonging life expectancy and increasing the quality of life of the elderly, as well as the aging prophylaxis, have become topics of urgent practical relevance and great scientific interest. An exceptional situation, such as the health crisis generated by the COVID-19 pandemic, which has profoundly affected life and lifestyle worldwide, highlighted even more, one of the promoted ideas of this book: the fact that the older adultsare “a very important resource, still little valued at both macrosocial and microsocial level” (Mitrache & Tüdös in the chapter of the book).

The phenomenon of aging is hypercomplex and multidimensional. Among the most important elements we mention the fact that it occurs as an effect of aging, through the progressive accumulation of changes in the body, which are responsible for the increasing susceptibility to develop a disease.There is a highlight on the phenomenon of multimorbidity, associated with the phenomenon of aging, which consists in the simultaneous installation of two or more chronic diseases. “Each historical era has its pathology. If 100 years ago most people would die of tuberculosis, today they are dying of cardiovascular disease, metabolic diseases and cancer. Thus, diseases with a well-known causality, such as microbial factors, have been replaced by diseases with a lesser known causality, such as mental illness, metabolic diseases, cancer and cardiovascular diseases” (Restian, 2010, pp. 65).

Also, aging is manifested by the functional decline of different organ systems, a phenomenon that is reflected in the progressive decrease of the person's bio-psycho-social capacities and performances. That means physical, mental and social aging.

At macrosocial level, the issues of increasing life expectancy, successful aging, increasing the quality of life of the elderly, as well as the prophylaxis of aging are areas of great economic, political and social interest. Thus, “the level of economic and social development of a country is also reflected by demographic indicators that express the average life expectancy of a person (indicator: life expectancy at birth) or the number of years that people can enjoy, without limitations caused by diseases or disabilities (indicator: healthy life expectancy)” (Mitrache & Tüdös in the chapter of the book).

In the last years, with regard to the integration and participation of the elderly in the society, a number of measures have been taken to promote successful aging and intergenerational relations based on cooperation. Thus, the United Nations launched in Madrid (2002) the invitation to “build a society for all ages”, initiated an Action Plan (The Madrid International Plan of Action on Ageing) and signed a Political Declaration (The Political

Declaration adopted at the Second World Assembly on Ageing) (United Nations, 2002).

"In 2017, health spending accounted for 9.6% of GDP in the EU as a whole, up from 8.8% in 2008. Population ageing means not only that health care needs will increase in the future, but also that there will be increasing demand for long-term care. Indeed, spending on long-term care is expected to grow faster than spending on health care" (OECD/European Union, 2018, p.3).

"Over the past two decades, <active aging> has emerged in Europe as the foremost policy response to the challenges of population aging" (Foster & Walker, 2015, p. 83).

In the literature, there are many terms circumscribed to the issue of "aging well". "These include successful aging, active aging, healthy aging, positive aging, productive aging, and competent aging. Each one of these concepts implies a (sometimes subtly) divergent approach to the gains and potential of aging" (Barrett & McGoldrick, 2013). The most prevalent terms employed over recent decades have been successful aging in the United States and active aging in Europe (Constança, Ribeiro, & Teixeira, 2012), (Foster & Walker, 2015, p. 84).

But these topics are also of great interest on a personal level, because the phenomenon of aging is strongly individualized.

The quality of life at an old age reflects the whole personal history of the individual, of the adopted lifestyle, of the way he managed the resources and capitalized on the opportunities and chances. For example, researches on twins (Baird, Osmond & Bowe, 1998) in the United States, Denmark, Finland, and Asia has shown that about 25% of a person's aging is genetically determined, and about 75% is related to the lifestyle, to the decisions and choices he makes" (Mitrache & Tüdös, in the chapter of the book).

Currently, the role of psychological factors, of the personality, in the process of successful aging, is more and more emphasized. For this paper, the psychological wellbeing is also of interest, as a factor that can improve the negative mental health of the elderly, while they are experiencing the aging process (Berceanu, in the chapter of the book).

Taking into account the continuous increase in life expectancy of the elderly population, the specific needs and manifestations, the increased risk of suicide and associated diseases, it is necessary to identify depression, its risk factors and explore the family environment as having health implications on the physical and mental health of the elderly. With retirement, the contact with former colleagues decreases, the socialization decreases, and the quality of the marital relationship becomes more

important. It is clear that the quality of life decreases with age and that these age-related inconveniences are better faced by married people who have good communication and satisfaction within the family.

In Romania, between July 1977 and March 2001, the retirement age limit was set at 62 years for men and 57 for women (Marea Adunare Națională, 1977). Then, the retirement age gradually increased. According to the latest law, Law 263/2010, the standard retirement age is 63 years for women and 65 years for men. For men, the extension was performed gradually, by January 2015. For women, the extension will be performed gradually, by January 2030 (Annex 5). For example, a woman born in August 1957 will retire in June 2018 at the age of 60 years and 10 months (Casa Naţională de Pensii Publice, 2010). It is still under debate whether, starting January 2035, women will retire, such as men, at the age of 65. Certain job categories retire earlier, and others may extend their activity later.

The opinions of people regarding the extension of their activity after the retirement age are pros and cons, depending on the retirement amount of money they receive, their economic and financial situation, their physical and emotional availability to get involved in raising, caring for grandchildren, and on health as well.

The approach of retirement, when professional, social and family requirements decrease, comes withan almost unlimited free time, without restrictions. However, age-related physical and psychiatric disorders may occur in the elderly who restrict the range of their leisure activities.At any age, especially when it comes to older adults, the family has an essential role in their emotional state; cooperation between extended family members, vertically andhorizontally, and spending free time together helps to maintain a good spirit and optimism (Rada, 2014).

Of course, satisfaction with their past life has a positive impact on the way people live their old age.For the most part, when one retires, life is arranged, the professional, social, family goals have been reached, and as a result, all the seniors should do is enjoy the freedom of so much free time.It is not too late to decide to spend their free time in a healthy way, to do things they wanted to do when they were younger, to allow themselves to experience passions, hobbies (Rada 2017, 2018).

Forms of depression in the elderly may go unnoticed because they may be confused with symptoms of age-related problems, other illnesses, medications. For these reasons, many elderly people with depression do not receive adequate treatment. Adaptation to physiological, psychological and social decline, part of the aging process, depends on individual coping strategies. Not all seniors are depressed. Rada C (in the chapter of the book)

found for the Romanian sample investigated that the extent of depressive symptoms increases slightly with age. At the same time, the quantitative and qualitative results obtained through the interview showed that there is a correlation between depression and physical health and between depression and family climate as well. They seem to potentiate each other.

The lifestyle adopted by each person is one of the factors underlying the individualization of the phenomenon of aging and is multi-determined. "The lifestyle of each individual depends on many genetic factors, type of personality of that individual, culture of the individual and the society he lives in, traditions and rules of the society, degree of education of the individual, religion, socio-economic conditions at its disposal and religion of the individual. The lifestyle depends on resources, housing, profession, social position, transport conditions, hygiene conditions in the community" (Restian, 2010, p. 67).

The book brings together informations and offers a series of solutions to adopt a lifestyle organized on scientific criteria, creating premises for the physical, mental and spiritual well-being of the person, for developing and maintaining his ability to keep on having a socially and economically productive life, for as long as possible.

It is especially important for the person to conceive and adopt a scientifically organized lifestyle. "Anti-aging medicine aims at the prevention and prophylaxis of aging, starting form the adolescence period, aiming at controlling and combating the causes that determine normal aging and those that transform normal aging into pathological aging" (Mitrache & Tüdös in the chapter of the book). If, when adolescent, young or adult, the person has adopted a healthy lifestyle, this creates the premises for improving the quality of life later on. Each time that this beneficial change occurs in the person's life, the positive effects will appear, both physically and mentally.

Stressors usually act in an integrated manner: if somebody has an unhealthy lifestyle, the negative effect of stressors is amplified and affects the whole life of the person. In order to counteract their aggression and to reduce their harmful potential, it is necessary to conceive an integrative, systemic, holistic approach on the person, taken as a whole system, tackling physical, mental, spiritual and social aspects. The "system of regulation lines" proposed by Mitrache G & Tüdös in one of the chapters of this book is conceived as a general model of intervention for the aging prophylaxis. It consists of 7 modules, each intended for a "regulation line", ranked in a system of action, which starts from the integration in the natural-cosmic environment, to the integration in the socio-cultural environment (school, professional, etc). The systemic approach of these "regulation lines" draws

attention to the informational and energetic connections between them.The beneficial effects of the intervention are based on the synergic action of the elements. Through them, the complex intervention is pursued both at the somatic level, as well as motor and psychomotor, sensory, logical, intellectual, spiritual, psychosocial, etc. in order to educate a system of sanogenetic behaviors that potentiate their beneficial effects on the person.

In promoting educational programs for a healthy lifestyle (nutrition, physical movement), messages should be individualized according to socio-demographic characteristics and specific motivations throughout family life cycles. As for the elderly, it should be stressed that regular physical activity may be an important potentially protective factor against cognitive decline and cardiovascular diseases.

Cho, Martin & Poon (2014) highlighted "significant direct effects of physical health impairment and social resources on positive aspects of subjective well-being among oldest-old adults". Also, the cited authors highlighted "significant indirect effects of cognitive functioning and education on positive affect among oldest-old adults "(Cho, Martin & Poon, 2014, p.132).

In the last decades of the 21st century, the importance of the internet has increased considerably, its development changing organization and functioning in almost all fields. During the pandemic period due to the SARS-CoV-2 virus (in Romania the first case was confirmed on February 26, 2020) (Digi24), internet and mobile technology became urgently needed for teaching school lessons, learning, working at home, medical consultation, prescription and more.

Most studies on internet use are conducted on young people and are focusedrather on the negative effects of its excessive, uncontrolled use (Anique, Scheerder, Alexander, van Deursen & Jan van Dijk, 2019). Fewer studies are written about the benefits associated with online activities for older adults. Compared to young people, the elderly have a certain specificity regarding the purpose of using the Internet. Sun and co-workers (2020) concluded, after studying a sample of 669 Chinese people over the age of 60, that nearly three-quarters of them use the Internet for online dating and a slightly lower percentage for diet information. Marinescu V (in the chapter of the book), using the in-depth interview with people aged 65 and over in Romania, is concerned with the relationship between the use of the Internet by the elderly for health information and interpersonal communication with their doctors on medical issues and health treatments.

The supportive intervention of patients with Alzheimer disease must be based on scientific facts. The different forms of Alzheimer dementia (vascular, frontotemporal, related to the abusive consumption of alcohol,

with Lewy bodies etc.) are characterized by a progressive decline of mental functions. Memory, language, intellect, social skills, emotional reactions, behavior are affected. As the disease progresses, the person's ability to perform daily activities is reduced. Early diagnosis and treatment allow the disease evolution to slow down. The initial stage is often ignored and interpreted by the specialist, family and friends as a "senility" or as a normal aging phenomenon. As the disease progresses, the disorders become more obvious and embarrassing. In an advanced stage, the patient degrades mentally (does not recognize people, may have inappropriate public behavior etc.) becomes addicted (cannot feed, dress, move etc.). In these circumstances, the patient's family, the specialists, the staff of the medical center who care for these patients must do so to ensure a routine that facilitates the patient's life, to help the patient maintain his dignity, to avoid conflicts, to avoid insistently showing him the mistakes he makes, to give him as much as possible a sense of security etc. (Romanian Alzheimer's Society). World Alzheimer's Day was launched in 1994 under the umbrella of the International Federation of Alzheimer's Disease International, which includes 100 Alzheimer's disease support associations around the world under the auspices of the World Health Organization. In Romania, it is not yet recognized that dementia represents a public health issue, as no national strategy for this condition has been developed. This is problematic, considering that 3-4 persons are involved in the life of a person with dementia (World Alzheimer's Day - 21 September 2019).

The lifelong learning, the continuous efforts that the person makes for personal development, which is the main integrative core of a healthy lifestyle, organized on scientific criteria, have the effect of amplifying the cognitive reserve. It has been discovered that in patients with neurocognitive disorders, the therapeutic approach that integrates the theory of cognitive reserve can lead to improved quality of life, but also to a significant reduction in care costs that affect both family and community and society as a whole (Moglan, Boscaiu & Tudose in the chapter of the book). The authors cited above show that, for these patients, the clinical symptoms of the disease appeared earlier in people with a lower level of education and later in those with a high level of education, which led to the conclusion that the cognitive reserve may have acted as a moderator of the relationship between changes in the brain and the clinical profile of neurodegenerative pathology. The authors of this chapter confirmed the hypothesis of cognitive reserve - the fact that cognitive reserve allows certain people to cope better with the pathology and to remain clinically intact for longer periods of time.

The pain assessment, the emotional approach in patients with neurovegetative disorders is a challenge due to the progressive deterioration

of their ability to understand and communicate, which leads to its underdiagnosis.

The person suffering from pain manifests himself verbally and nonverbally. In the elderly, a problem is that they have a decrease in sensitivity to weak pain and an increase in vulnerability to persistent pain (Tudor, 2013).

The assessment of behavioral and psychiatric symptoms of dementia through scales and observation can provide relevant data based on which to identify the prevalence and pain management in people with dementia. This is even more important in the case of people with dementia, hospitalized or in nursing homes. The depressed mood in some patients with dementia may be an indicator of pain. Sampson et al. (2015) stated that improving mood in hospitals can improve pain management. The relationship between impaired emotional decoding abilities and the severity of dementia is not clearly highlighted by studies, but a light in this regard can be seen through analyzingthe aggressive behaviors and theagitation caused by pain and the connections between them (Stan V. in the chapter of the book).

Age-related societal stereotypes continue to perpetuate themselves affecting the lives of the elderly. In a review of the literature, Dionigi (2015) shows that both implicit (subtle / subconscious) and explicit (conscious) negative age stereotypes can have negative effects on older people when they perform physical and mental tasks.

Studying 126 children aged 3 to 6 years testifying about the old age, as well as the opinions of parents about the elderly, Flamion, Missotten, Jennotte Hody & Adam (2020) discovered that the opinions of children were not correlated with those of their parents: children's responses were more personal and emotional, while parents tended to adopt global stereotypes. Preschoolers had positive opinions when asked to evoke grandparents or think of a known person. It is a fact that demonstrates the importance of children's relationship with their elderly relatives, an aspect that must be taken into account in education, in order to value the elderly from the perspective of their potential.

Concerned about the impact of stereotypes and prejudices on mental health among the elderly, Berceanu D. uses four evaluation tools on a sample from Romania, namely: Ageism scale (Palmore (2001), Scale for Generalized Anxiety Disorder (GAD-7) (Spitzer, Williams, & Kroenke, 2006), Scale Depression (CES-D) (Radloff, 1977; Stevens, Constantinescu, Uscătescu, Ion, Butucescu, 2011) and Scale for Psychological Well-Being (Riff et al, 2006). After getting good internal consistencies of the questionnaires, the author applies them and identifies through statistical analysis in her chapter of this book that ageism can significantly predict

increased levels or a higher number of depressive and anxious symptoms, on the one hand, and a lower level of psychological well-being in the elderly on the other hand. The International Day of Older Persons, October the 1st, is a good opportunity to raise awareness of stereotypes and aging-related prejudices.

This book, written by a group of authors with various specializations (sociology, medicine, clinical psychology and psychotherapy, sports psychology, educational psychology and vocational counseling etc.), which operates in prestigious research institutes and universities from Romania, promotes an integrative, systemic and holistic approach of the person and the access to a higher level of knowledge through a multi-, inter- and transdisciplinary methodology.

The book is addressed to both specialists and the general public, all those who want to gather information and solutions on improving the quality of life and life satisfactionof the old people, reducing their anxiety, depression and pain, and on prophylaxis of aging.

PhD Tatjana PAVLICA, Faculty for Sciences
Department for Biology and Ecology, Novi Sad, Serbia

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Chapter 1

Risk factors for depression, cohesion, flexibility, communication, marital satisfaction among the elderly in Romania: a quantitative and qualitative study

Cornelia RADA[1]

Abstract
The current study explores the depression and its risk factors among the elderly in a family environment. A cross-sectional study was performed between 2016 and 2017 on 601 patients aged 55-93 years and 14 face-to-face interviews were carried out from 2015 to 2017. The Geriatric Depression Scale, the Family Adaptability and Cohesion Scale IV (FACES IV), the Family Communication and Satisfaction scales, Pearson's chi-square test (χ^2) and the Kruskal-Wallis test (K-W) have been used. Over 50% of participants had mild and severe depression, with higher percentages among participants over 75 years of age (χ^2, p=.003) and among subjects with low income (χ^2, p= .014). The prevalence of depression was higher in rural participants (K-W, p=.044) and in those without a partner (K-W, p=.0044). According to the FACES IV, more than 50% of the sample belonged to the mid-range and unbalanced family categories. Low income levels have been associated with higher levels on all four unbalanced scales of the FACES IV. Severe depression was higher within families belonging to the unbalanced category (χ^2, p =.019), on very low satisfaction and communication (χ^2, p=.000).There is a correlation between depression and physical health as well as between depression and family climate. These correlations seem to be mutually reinforcing.

Keywords: elderly, depression, FACES IV, Family Communication Scale, Family Satisfaction Scale
Risk factors are characteristics, diseases and behaviors that are involved in triggering diseases or problem such as: body mass index, sedentary lifestyle, alcohol consumption, smoking. hypertension, hypercholesterolemia, diabetes, depression, age, gender, income, environmental pollution, social isolation, etc.
FACES IV- Family Adaptability and Cohesion Evaluation Scale 4th version measures the dimension of family cohesion with three scales: balanced family cohesion, disengaged and enmeshment. The dimension of family flexibility (adaptability) is measured with three scales: balanced family flexibility, rigid and chaotic.

[1] Correspondence address: Biomedical Department, Francisc I. Rainer Anthropology Institute of the Romanian Academy, Academy House, 13 September Avenue, No.13, 5th District, Bucharest, Romania, Zip Code 050711, tel. +40728824852; fax +4021.3175072; E-mail: corneliarada@yahoo.com

Family Communication Scale - contains 10 items and measures different aspects of family members such as: family members are good listeners, express affection to each others, calmly discuss problems with each others, express true feelings to each others, etc.
Family Satisfaction Scale - contains 10 items and measures different abilities of family such as:
to resolve conflicts, to be flexible, to cope with stress, etc.

Background

In 2015, 12% of the world population was aged 60 years and more, and this population continued to increase. The most common mental and neurological disorders among people over age 60 were dementia and depression, which affected approximately 5% and 7% of the world's older adult population, respectively (WHO, 2017a).

The prevalence of depression (% of the population) in Europe in 2015 was higher in Ukraine (6.3), Estonia (5.9), Greece, Portugal (5.7), Finland, Belarus, and Lithuania (5.6) and lowest in Tajikistan (3.8), Iceland, Kyrgyzstan (4.1), Turkmenistan, and Uzbekistan (4.2). In Romania, the percentage of depression was 5%, similar to Armenia, Denmark, Georgia, Luxemburg, Serbia, Switzerland, and the Republic of Macedonia (WHO, 2017b).

Depression in the elderly is recognized as a public health problem (McDougall et al. 2007).

Some of the major symptoms of depressive disorders (major, persistent, due to another medical condition) include diminished interest in almost all daily activities, psychomotor sluggishness, fatigue, lack of energy, lower concentration, indecision, and decreased self-care (American Psychiatric Association, 2016).

For the elderly, the negative consequences are worse because most people, especially in the second part of the third or fourth age, suffer from other health issues, such as hypertension, hypercholesterolemia, and arthrosis. First, as a result of depression, they no longer adhere to their treatments, or they do not go to the doctor for these conditions or for other possible illnesses. Because the diagnosis of such diseases occurs late in life, the costs to healthcare systems tend to increase. Second, for the elderly, depressive symptoms are often unnoticed and untreated because they coexist with other health issues. Thus, the costs become higher for the healthcare system, on one hand because the treatment of depression is delayed, and on the other hand,because it is possible that, when this depressive background is not considered, the response to the treatment of a chronic illness may not occur as expected.

The signs of depression in the elderly may be unnoticed because they tend to be confused with symptoms of age-related issues, other diseases, or medication. The differential diagnosis between depression and dementia raises certain problems in the elderly because they have some common symptoms (Centers for Disease Control and Prevention, 2017).

For example, both in depression and in Alzheimer's disease (especially in the early and middle stages), cognitive, affective, hearing, speech, behavioral problems occur (Rotomskis, et al., 2015).

Moreover, the differentiation between depression and apathy should be made (Serby & Yu, 2003). The risk of mistaking major depressive episode for normal sadness and mourning following the death of the someone is higher in the elderly because they are more likely to face such situations. For this reason, many older people with depression do not receive adequate treatment.

Diabetes, coronary heart disease, sensory impairment (vision loss or hearing loss), and conditions associated with pain (such as arthritis)have been associated with depression (Biddulph et al. 2014; Scott et al. 2007).

Research also highlights a correlation between depression on the one hand and cognitive impairment after falls among elderly people on the other hand (Papazacharias & Nardini, 2012; Davoodi, Etemad, Tanjani & Khodakarim, 2016).

Patients with major depression have a cognitive deficit, especially in the language domain, in comparison with non-depressive patients (Irfan & Khalid, 2011).

More people over 65 years of age commit suicide than people of any other age group do, and most of these older adults who commit suicide have major depression (Rodda, Walker & Carter, 2011).

Stressful life events, loss of social roles, changes in health and decreased physical and cognitive abilities are factors that trigger depression in the elderly. In their case, drug-induced depressive disorder and depressive disorder due to another medical condition are more common because they generally have a chronic pathology (Fiske, Wetherell & Gatz, 2009; American Psychiatric Association, 2016).

Adaptation to physiological, psychological and social decline, which are specific to aging and natural in the elderly, depends on individual coping strategies and adaptation mechanisms. Not all older people are depressed. Cognitive behavioral therapy affirms the importance of thinking styles in developing and maintaining depression as well as other conditions such as anxiety. Most often the focus on the shortcomings, on their exaggeration could trigger and maintain depression. The cognitions that cause depression are: dysfunctional automatic thoughts (such as catastrophic thinking,

reducing the importance of positive actions) maladaptive beliefs (e.g. if I have a problem for a long time that means I cannot change, I should not be depressed) negative self image (Leahy & Holland, 2012).

At any age, especially for the elderly, family plays a major role in one's emotional state, including cooperation among the members of the family of origin and among the members of the family of procreation, i.e., vertically and horizontally, respectively. Additionally, spending leisure time together generate positive mood and optimism (Rada, 2013; Rada, 2014).

Taking into account the continuous increase in life expectancy, the different needs of the elderly compared to those of the young, the specific symptoms, and the higher risk of suicide and associated diseases, it is necessary to identify depression, its risk factors, and its treatment for the elderly. At the same time, it is useful to explore the family environment as a factor with implications for the physical and mental health of the elderly, which is a less researched topic. The current study identifies these issues.

Methods

Design and sampling

This article is based on a quantitative cross-sectional study performed between 2016 and 2017 when 601 patients aged 55-93 years were treated at the Ana Aslan National Institute of Gerontology and Geriatrics. Table 1 shows the basic socio-demographic variables of the sample population.

Table 1
Socio-Demographic and Family Characteristics of the Participants

Socio-demographic data	N	%
Gender		
Female	492	81.9
Male	109	18.1
Age groups (years)		
55-64	224	37.3
65-74	272	45.3
75-79	70	11.6
80+	35	5.8
Place of residence		
Urban	445	74.0

Socio-demographic data	N	%
Rural	156	26.0
Marital status		
Married	318	52.9
Widowed	202	33.6
Divorced	55	9.2
Consensual union over 1 year	19	3.2
Unmarried (single)	7	1.2
Monthly Income*		
Less or equal to 215EUR	224	37.3
216-429	289	48.1
430-644	57	9.5
645-858	13	2.2
Over858 EUR	18	3.0

*Conversion of RON into EUR according to the National Bank of Romania exchange rate on 5 April 2018.

Data collection

Depending on the doctor's recommendation and diagnosis, up to 15 blood tests were performed (usual clinical parameters) on the patients. Several questionnaires were administered, including personality, memory, quality of life, and an omnibus-type questionnaire, with 36 items that collected socio-demographic data, data on behaviors harmful for health, and opinions and attitudes relevant to the elderly's health. For this study, the 30-item Geriatric Depression Scale (GDS) (Yesavageet al. 1982) and the FACES IV Package were used, which contains eight scales: six scales from the Family Adaptability and Cohesion Scale IV (FACES IV) with 42 items and the Family Communication and Family Satisfaction scales, each with10 items (Olson, 2010). FACES IV were validated on the Romanian population (Rada, 2017; Rada, 2019).

The questionnaires were completed during face-to-face interviews with each patient. These interviews were conducted by a psychologist. The response rate was 100%.

In addition, between 2015-2017, face-to-face interviews with 50 subjects were organized on 4 themes: cohesion, adaptability, commu-

nication, and satisfaction within the family and the affective state. Non-cooperative people and individuals with strong auditory or visual sensory deficits, severe cognitive deficits or disorders accompanied by psychotic elements with serious somatic pathology were excluded from the interviews.

Informed written consent was obtained from each participant at the time of recruitment. The study was approved by the Ethics Commission of the Francisc I. Rainer Anthropology Institute of the Romanian Academy (no. 153/01-03-2016).

Data analysis

GDS categories were calculated as follows: normal 0-9, mild depressive 10-19, and severe depressive 20-30 (Yesavageet al. 1982).

The FACES IV measures the dimension of family cohesion with three scales: balanced family cohesion, disengaged and enmeshment. The dimension of family flexibility (adaptability) was measured with three scales: balanced family flexibility, rigid and chaotic. Their calculations, as well as that of the Family Communication and Family Satisfaction scales, were in compliance with the manual and the recommendations of the author who created this instrument, so that the total raw score was converted into a percentage score using the Percentile Conversion Chart (Olson, 2011).

Pearson's chi-square test (χ^2) and the nonparametric Kruskal-Wallistest (K-W) were performed using the SPSS statistical program (IBM Corp, 2011).

As some assumptions required by parametric statistical tests have not been fulfilled, nonparametric tests, such as K-W, have been used because they are based on fewer assumptions. The cost of fewer assumptions is that nonparametric tests are generally less powerful than their parametric counterparts are.

The demographic variables used in the statistical analyses were gender (male or female), age group (55-64, 65-74, 75-79 and 80 and more), place of residence (urban or rural), marital status (married, widowed, divorced, consensual union over 1 year, and unmarried-single) and income.

The current study aims to identify the following: 1) the prevalence of depression; 2) the cohesion, flexibility, communication and satisfaction within the family; 3) the impact of the socio-demographic variables on the previously mentioned variables; and 4) the possible correlations between these elements. This study also explores five fragments of the interviews concerning the above mentioned aspects.

Results

The prevalence of depression and the impact of socio-demographic variables

According to the Geriatric Depression Scale, the sample was structured as follows: 48.3% (N =290) without depression, 40.4% (N=243) with mild depression, and 11.3% (N=68) with severe depression.

There were statistically significant differences in geriatric depression categories by age group and income. Mild depression prevailed in individuals over 75 years old. The highest share of participants with severe depression was registered in the case of people who were over 80 years old (Pearson chi-square=19.508, df=6, p=.003). In subjects with incomes below 429 EUR, the prevalence of mild depression and severe depression was higher (55.1%) than among those with higher incomes (29.8%) (χ^2 =19.214, df=8, p=.014) (Table 2).

Table 2
Distribution of Geriatric Depression Scale Categories According to theAge Groups and Income

Socio-demographic variables	Categories – Geriatric Depression Scale		
	Normal	Mild depression	Severe depression
Age groups (years)			
55-64	50.4	40.2	9.4
65-74	52.9	36.8	10.3
75-79	34.3	51.4	14.3
80+	25.7	48.6	25.7
Monthly income			
≤ 215 EUR	42.9	45.5	11.6
216-29	46.7	41.5	11.8
430-644	64.9	22.8	12.3
645-858	84.6	15.4	0
Over 858 EUR	61.1	33.3	5.6

The χ^2 statistic did not show statistically significant differences in Geriatric Depression Scale categories based on the following socio-demographic variables: gender, place of residence and marital status. However, the following differences were observed. The percentage of those with mild depression and severe depression was higher in women (52.5%) than in males (48.6%), higher in rural areas (57%) compared to urban areas

(49.9%) and higher in subjects without a partner (65.26%) in comparison with people with a partner (47.85%).

However, using the K-W, statistically significant differences were identified in the GDS scores on the one hand and in the residence environment and civil status on the other hand. Mean rank values were lower in urban subjects than in rural subjects ($\chi 2(1)=4.058$, p=.044),as well as in married subjects (with and without official documents) than in divorced, widowed, or unmarried subjects ($\chi 2(1) =8.445$, p=.004) (Table 3).

Table 3
GDS Mean Rank Scores by Place of Residence and Marital Status

Demographic variables	Mean Rank
Place of residence	
Urban	292.56
Rural	325.07
Marital status	
Married (with or without official documents)	282.80
Divorced, widowed, unmarried	324.23

There were no statistically significant differences in gender or through the Kruskal-Wallis test of GDS scores.

Cohesion and flexibility within the family and the impact of socio-demographic variables

According to the FACES IV, the categories to which families were assigned were balanced (43.1%; N=259), mid-range (34.4%; N=207) and unbalanced (22.5%; N=135).

The $\chi^2$and K-Wtests did not show statistically significant differences in these family categories based on gender, age group, marital status and income socio-demographic variables.

At the same time, the χ^2 for the scales of the FACES IV Package did not show statistically significant differences, depending on the socio-demographic variables included in the analysis (p=.051).

With regard to income level, the K-W indicated significant differences on the disengaged level ($\chi 2(4)=0.504$, p=.033), enmeshed level ($\chi 2(4)=15.708$, p=.003), rigid level ($\chi 2(4)=13.103$, p=.011 and chaotic level (($\chi 2(4)=16.116$, p=.003). On all these scales, the mean rank was the highest in the subjects with low income.

For both the disengaged level and the enmeshed level, the mean rank was the highest for the 75- to 79-year-old group and for those in rural places of residence. The K-Wtest indicated significant differences on the following variables: the disengaged level ($\chi 2(3)=8.825$, $p=.032$) and the enmeshed level ($\chi 2(3)=9.754$, $p=.021$), as well as the place of residence on the disengaged level ($\chi 2(1)=5.519$, $p=.019$) and enmeshed level ($\chi 2(1)=4.569$, $p=.033$) (Table 4).

Table 4
Unbalanced Scales Mean Rank Scores by Demographic Characteristics

Scale FACES IV	Monthly Income	Mean Rank	Age Groups	Mean Rank	Place of Residence	Mean Rank
Disengaged Level	≤ 215 EUR	321.01	55-64	285.59	Urban	291.35
	216 -429	295.99	65-74	297.33		
	430-644	291.48	75-79	350.23	Rural	328.53
	645-858	227.77	80+	329.69		
	Over 858 EUR	215.36	-	-	-	-
Enmeshed Level	≤ 215 EUR	332.76	55-64	290.03	Urban	292.22
	216-429	286.94	65-74	301.38		
	430-644	285.11	75-79	354.44	Rural	326.04
	645-858	212.69	80+	261.34		
	> 858 EUR	245.61	-	-	-	-
Rigid Level	≤ 215 EUR	324.33	-	-	-	-
	216-429	293.05	-	-	-	-
	430-644	283.59	-	-	-	-
	645-858	305.54	-	-	-	-
	> 858 EUR	190.22	-	-	-	-
Chaotic Level	≤ 215 EUR	333.00	-	-	-	-
	216-429	289.87	-	-	-	-
	430-644	266.40	-	-	-	-
	645-858	222.00	-	-	-	-
	> 858 EUR	248.11	-	-	-	-

By both the χ^2 and K-Wstatistics, there were no statistically significant gender differences in the 8 scales of the FACES IV Package.

GDS and FACES IV Package

The distribution of the scores on Geriatric Depression Scale with regard to the family categories registered statistically significant differences, and severe depression was higher within families in the unbalanced category (χ^2=11.746; df=4; p=0.019) (Table 5).

Table 5
The Distribution of the Family Categories According to Geriatric Depression Scale Categories

Family Categories	Depression Scale Categories		
	Normal	Mild depression	Severe depression
Balanced	45.9	43.2	10.8
Mid-Range	54.6	36.7	8.7
Unbalanced	43.0	40.7	16.3

The distribution of the categories according to Geriatric Depression Scale, taking into account the scale of the FACES IV Package, registered statistically significant differences (p=.000). Those with severe depression were highest on the disengaged scale (χ^2=56.223) and on very low satisfaction (χ^2=51.522). Those with severe and mild depression were higher on the rigid (χ^2=46.706) scale and on very low communication (χ^2=43.793) (Table 6).

Table 6
The Distribution of Cohesion, Flexibility, Communication and Satisfaction According to Geriatric Depression Scale Categories

Scales of FACES IV Package	Categories according to the Geriatric Depression Scale		
	Normal	Mild depression	Severe depression
Cohesion			
Disengaged	30.8	45.0	24.2
Somewhat Connected	38.2	52.8	8.9
Connected	56.0	31.9	12.1
Very Connected	50.4	41.5	8.1
Enmeshed	66.4	30.3	3.4
Flexibility			
Rigid	29.7	46.6	23.7

Scales of FACES IV Package	Categories according to the Geriatric Depression Scale		
	Normal	Mild depression	Severe depression
Somewhat Flexible	45.9	42.6	11.5
Flexible	48.3	40.0	11.7
Very Flexible	52.1	38.8	9.1
Chaotic	65.0	34.2	0.8
Communication			
Very Low	28.8	48.3	22.9
Low	42.1	47.1	10.7
Medium	53.1	35.4	11.5
High	56.5	35.9	7.6
Very High	62.1	33.6	4.3
Satisfaction			
Very Low	29.3	44.8	25.9
Low	48.4	40.3	11.3
Medium	42.7	47.6	9.7
High	58.5	35.0	6.5
Very High	62.3	34.2	3.5

Quotes from interviews

Below are five excerpts from the 14 interviews carried out from 2015-2017, which are suggestive of affective state and for cohesion, flexibility, communication and satisfaction within the family.

I. R.A.O, male, 66 years old, employee, higher education, urban residence; balanced cohesion - connected type, balanced flexibility - flexible type, high family communication and family satisfaction; score on GDS in the normal category.

> "The most important thing and the greatest satisfaction now at my age are to be with someone. There is someone who waits for you, and you wait for somebody at home. Our communication was good, clear and precise. She said, 'do this, don't do this,' and I tried to meet the demands. My wife understood that men have thoughts and ideas in some drawers and that we do not want them open at the same time because we simply do not understand. In our case, cohesion has meant the fact that we think, we feel, we express ourselves the same way concerning the most important

things. Peace and tranquility in our home give me hope that we can age together nicely."

II. M.G., female, 65 years old, employee. Balanced cohesion - somewhat connected type, unbalanced flexibility - rigid type, low family communication and very low family satisfaction; score on GDS in the mild depressive category.

> "We remained together as a duty; we tolerated each other and nothing more. Our main occupation was to tell the child what to do and what not to do. The way we went forward was with overwork and other external activities. This unsatisfactory relationship with my husband darkens my future, especially now in old age."

III.G.I., female, 66 years old, retired, secondary education, rural residence. Unbalanced cohesion - disengaged type, unbalanced flexibility – rigid type, very low family communication and low family satisfaction; score on GDS in the mild depressive category.

> "It is desirable that family should be the place where love and understanding are found, where the forces can be refreshed and the batteries recharged, especially in difficult times generated by the outside world. This was not my case. My husband was verbally and physically aggressive with me and the child. He used to get angry over nothing and to tell me terrible insulting words. I did not have the power to divorce; my salary was low, I thought about my child, and my parents did not encourage me at all. Now there are fewer conflicts and scandals... I think he no longer has power. I was treated twice for depression. Now I have nothing else to do. Maybe I was born more sensitive... and now what else can I do at my old age?"

IV. R.C., female, 61 years old, retired, higher education, urban residence. Unbalanced cohesion- disengaged type, unbalanced flexibility - rigid type, very low family communication and satisfaction; score on GDS in the severe depressive category.

> "Retirement was a crucial moment that unbalanced us financially and emotionally. The incomes halved at the same time with the gradual increase in health expenditure. It was the toughest time for me, and I still cannot fully recover from it. As long as I went to work, I somehow managed to cope with the cold, with the lack of communication. It was a demanding job that I was often complaining about. Then, I realized that it was my air bubble where I could talk and get

> rid of my mute husband – the iceberg at home. Now we are obviously two strangers; he is in a room with his TV set, I am in another room with my TV set and my concerns. When I come out of depression, I have the power to tell him that love and affection are not proven by taking out the garbage, by cooking, or by bringing money into the house. My husband has always said that I was difficult and demanding, with requirements too subtle and refined for him."

V. P.I., male, 75 years old, retired, secondary education, rural residence. Unbalanced cohesion – disengaged type, unbalanced flexibility – rigid type, very low family communication and mediumfamily satisfaction; score on GDS in the mild depressive category.

> "If I had not fallen ill with diabetes, things would have been worked. I realize that I have become unbearable and moody, and that's why my wife avoids me. I became nervous because of the disease and, in order to avoid quarreling, I prefer to do things alone or to go and talk to my brother. Now that I have to eat at certain hours, we have to be even more organized and respect the rules. I'm sad because there is so much silence between us. When my daughter visits us, tears fill my eyes when I see how helpless I have become."

Discussion

The prevalence of depression and the impact of socio-demographic variables

As a result of the unbalanced sample with regard to gender, age group, place of residence, marital status and income, it was difficult to identify correlations and differences with strong statistical significance on these socio-demographic variables concerning the prevalence of depression, the family categories (balanced, mid-range, unbalanced), and the eight scales of the FACES IV (balanced family cohesion, disengaged and enmeshment, balanced family flexibility, rigid and chaotic.) When the χ^2 statistic did not identify significant differences, the K-W test was applied, but the latter test has lower power.

The gender structure of the sample reflects the "feminization" of the elderly population. The distribution for place of residence, with the larger share of participants from urban environments, reflects the fact that the urban population has easier access to hospitalization and that people in rural areas tend to have less demand for medical services.

Compared with other previous research conducted at Ana Aslan National Institute of Gerontology and Geriatrics (Bălăceanu-Stolnici, 1998; Şerbănescu, 2007; Răducanu, Fulga & Ionescu, 2012), the current study included a higher number of patients diagnosed with depression.

The research – carried out in 2009-2010 on 199 patients age 65 years and more, who were hospitalized at Ana Aslan National Institute of Gerontology and Geriatrics – determined that depression was associated with the female sex, older age, and the loss of a partner (Răducanu, Fulga & Ionescu, 2012).

The current study identified similar correlations, but not as strong, of a gender difference, and the parametric and nonparametric tests did not indicate that these differences were statistically significant. However, the interviews revealed that rumination was higher in women than in men. This finding shows, similar to other research, that the relationship between depression and gender is mediated by rumination (Trives, Bravo, Postigo, Segura & Watkins, 2016).

The literature review of 85 empirical studies from every continent except for Antarctica shows that gender differences regarding depression also remain the same over 60 years of age (Girgus, Yang & Ferri, 2017).

This result is similar to those of the current study, which identified that depression was higher among women, with a 3.9% higher prevalence.

In the Romanian sample under investigation in this study, a significant correlation was first established between depression according to age groups and income. Those with mild depression were primarily over 75 years old, and those with severe depression were mostly 80 years old and more. The magnitude of depressive symptoms increases slightly with age. Thus, after 75 years of age, the prevalence of mild depression is 1.3 times higher than in the 55-74 age group. Starting with the 55-64 age group, the number of people with severe depression gradually increases, so that at the age of 80, this number is over 2.7 times higher than that of the 55-64 age group.

In the United States, from 2007 to 2010, according to the National Health and Nutrition Examination Survey, the highest rates of depression were registered in the 40-59 years age group and the lowest in the 12-17 age group and the ≥60 age group (Centers for Disease Control and Prevention, 2012).

Blanchflower & Oswald (2008) suggested a U-shape of the well-being curve; subjective happiness is higher among young people and at the third age and is at its minimum at the second age.

The World Health Organization showed that the global prevalence of depressive disorders by age in 2015 was the lowest between 15 and 19 years

of age and over 80 years of age,and it was the highest between 60 and 79 years of age (WHO, 2017b).

Thus, the prevalence of depression decreases towards the fourth age, but it is higher even in the third age. In the Romanian sample, the prevalence of depression did not decrease in the fourth age.

In the present study, the prevalence of depression was 25.3% higher among people with low income. This result is similar to those of other studies that have shown that poor older adults have a higher risk of depression (Kim, Richardson, Park & Park, 2013; Runcan, 2013).

Below are specifications regarding retirement age, salaries and pensions in Romania, compared with those in the European Union.

In Romania, between July 1977 and March 2001, the retirement age limit was 62 years for men and 57 for women (Marea Adunare Naţională, 1977).

According to the latest law, Law 263/2010, the standard retirement age is 63 years for women and 65 years for men. For men, the extension was performed gradually, by January 2015. For women, the extension will be performed gradually, by January 2030 (Annex 5) (Casa Naţională de Pensii Publice, 2017).

People in certain job categories retire earlier, and others may extend their activity for longer periods of time.For example, the retirement age for research and development staff is 65 years for both women and men (Monitorul Oficial nr. 245, 2018).

The average salary in 2017 in the EU was 1,520 EUR, with 14 countries below the average – the last two being Romania and Bulgaria. For example, the average salary in Romania was 515 EUR, four times less than in Germany or France, more than 3 times less than in Italy or Spain, approximately 1.8 times less than in Estonia, approximately 1.6 times less than in the Czech Republic, and approximately 1.4 times less than in Poland, Croatia or Slovakia (Sanatos Voios, 2017).

In 2016, the average standard pension resulting from all years in service was 220 EUR in Romania, among the lowest in the European Union. For example, the average pension in Romania was five times less than in France or Italy, four times less than in Spain or Germany, 1.98 times less than in Poland, 1.77 times less in the Czech Republic, and 1.4 times less than in Croatia (Consilier Juridic Germano-Roman, 2016).

Secondly, there was a higher prevalence of depression among rural subjects (7.1% higher than among those in urban areas) and among those without a partner (17.41% higher than among those with a partner).

Depression in urban areas was expected to be higher than in rural areas as a result of daily stress. At the same time, this result seems

surprising given that in rural areas, the practice of religious rituals is higher and that people in rural areas declare themselves to be more faithful (Rada, 2013).

Research has shown that women who attend church more often have a lower risk of mortality and depression and a higher degree of optimism and social support (Li, Okereke, Chang, Kawachi & Vander Weele, 2016; Li, Stampfer, Williams & VanderWeele, 2016).

Despite this fact, in this Romanian sample, the prevalence of depression was higher in the rural environment, which could also be interpreted in terms of lower incomes, quality of life, and access to medical services than in the urban areas (Doltu, 2011).

Other research has also reported lower quality of physical and mental health in rural areas, especially among the elderly (Baernholdt, Yan, Hinton, Rose & Mattos, 2012).

This study has identified that unmarried older people have a greater risk of depression because they experience loneliness and have less social support. In a meta-analysis of 32 studies among individuals aged ≥ 55 years, Yan et al. revealed that an important risk factor of depression in the elderly is being unmarried (Yan, Huang, Huang, Wu & Qin, 2011).

Cohesion and flexibility within the family and the impact of socio-demographic variables

A very high cohesion, an over implication within the family, known as enmeshment, is defined by a low individualization of the family members who cannot live independently without feeling anxiety, anger or other emotional distress. Usually, when the baby is very small and requires care, this is normal. Later, the persistence of such parental behavior is unhealthy because it does not allow the child to become an independent and self-reliant adult. This symbiotic relationship at the level of adult couples has proven to be unhealthy (Berne, 2006). At the opposite pole are the families in which its members are very little involved called disengaged. Flexibility (Adaptability) is defined as the quality and expression of leadership and organization, role relationships, and rules and negotiation within relationships. Rigid and chaotic are the two unbalanced scales for flexibility.

In this Romanian sample, a rural residence was associated with two unbalanced scales, the disengaged and enmeshed scales of the FACES IV. This finding indicates a significantly lower level of balanced functioning of family cohesion.

The two unbalanced scales of the FACES IV, disengaged and enmeshed, were associated with the second part of the third age (75-79

years), which shows that in this age range (before the fourth age of 80+ years), there is a critical moment for the balanced functioning of the family system.

Low income levels have been associated with higher levels on all four unbalanced scales of the FACES IV: disengaged, enmeshed, rigid and chaotic. This finding also shows that the healthy functioning of the family system is affected by low incomes.

The flexibility dimension was affected only by the income levels through rigid (low scores in flexibility) or chaotic (high scores in flexibility) manifestations. In general, disengagement, engagement, excessive attachment– both voluntary (as a symbol of a symbiotic attachment) and involuntary (as a result of disabilities) – and chaos increase as the level of income decreases.

This unbalanced levels of cohesion and flexibility are associated with more problematic family functioning.

Further research is needed to identify why people in rural areas, those at the end of the third age (75-79 years), and those with low incomes have unbalanced levels in the cohesion dimension, both by disengagement (very low cohesion scores) and by excessive attachment (very high cohesion scores). There seem to be two different, contradictory coping mechanisms. With regard to the very high cohesion, the following explanation may be given. After many years of marriage, at an old age when health problems occur and require more mutual care, and when the number of years of life decreases, this excessive attachment might be understood as a coping mechanism. More research is needed to determine whether the unbalanced concept that Olson gives to this cohesive scale called enmeshment is also valid for elderly couples (Olson, 2011).

GDS and FACES IV Package

Severe depression has been associated with families in the unbalanced category (low cohesion and flexibility, respectively, disengaged and rigid families) and with very low communication and marital satisfaction.

In the disengaged family, the connection between the family members is low, “home” is just a place to sleep and eat, and the family members rarely spend their time together. It is natural that these situations have a negative impact on the emotional state of the family members, especially as they become chronic. Among the elderly, this situation is more serious because in European cultures, elderly couples most often live alone, while children and grandchildren live with their own families. Encouraging

and maintaining genuine contacts with the members of the family of origin – those who are still alive – and with the members of the family of procreation – their own children – and all forms of intergenerational support offer a state of well-being to elderly families (Rada, 2018).

The results of this study are consistent with those obtained by an American study on 11,065 individuals aged 50 and older who participated in the Health and Retirement Survey between 2004 and 2010, which revealed that those who had social contact with their children, other families and friends every couple of months or less were more likely to have clinical depressive symptoms than those who had more or less frequent contact (once or twice per month or per week); telephone, written, or e-mail contact did not decrease the likelihood of depressive symptoms. At the same time, it was stressed that in the prevention of depressive symptoms, contact with friends is more important among those between 50 and 60 years of age, and contact with children and family members is more important among those aged 70 and more (Teo et al., 2015).

Families with low flexibility are incapable of adapting to internal changes within the family or the outside environment. These families are characterized by authoritarian leadership, strict discipline, rare changes in roles, and too little change (Olson, 2011).

The association between rigid families and depression identified in elderly couples in the current study can be explained as follows. People with rigid thinking and behavior believe that things should be as they say and that only they are right, and such behaviore stranges the spouse, other members of the family, friends or other people with whom they interact. Rigid people are less agreeable; thus, the risks of loneliness and, consequently, of depression increase. Research has shown that flexibility is a resilience factor, a predictor of successful aging (Fontes & Neri, 2015) and that low psychological resilience is associated with depression, anxiety and low energy (Šmitas & Gustainienė, 2016).

Research shows the importance of the marital context for well-being after retirement (Szinovacz & Davey, 2004).

The association between depression and poor communication within the family in the case of older participants in this study can be commented upon as follows. In the case of couples with chronically low communication, after retirement, the deficit of communication may become more acute because the amount of time spent together increases. The time once dedicated to working at home or at the office can no longer be used as a sophisticated way of avoiding one another. The dynamics of couple relationships change when one of the spouses retires. Partners must face a

large amount of free time, and if they are not able to spend it using harmonious communication, they risk suffering from depression.

To a large extent, the individual is assessed, and he/she is conferred a status in connection with the job and with the idea of being an employee. Losing this status through retirement may increase one's risk of depression. Retirement restricts social relationships and can induce loneliness. Under these circumstances, communication with the family members becomes essential in preventing depression.

In the current sample, low marital satisfaction was associated with depression, a result that was also suggested by an Australian study using separate semi-structured interviews with both partners of 40 older couples, which revealed that the depressive symptoms of one member of the couple were associated with low marital satisfaction (Walker, Isherwood, Burton, Kitwe-Magambo & Luszcz, 2013).

Most of the papers showed that depression was more common in women than men. Biological, psychological and sociocultural explanations show why depression is approximately twice as common in women than in men (Kuehner, 2017; Burton, 2017).

In this Romanian sample, the only variable that did not statistically influence the latent elements in the analysis was gender. However, similar to other articles, this study revealed that the prevalence is higher in women than in men, but the gender differences are much lower (3.6%). More research is needed to clarify this issue, although it may be a specific pattern of patients requiring hospitalization and treatment to Ana Aslan National Institute of Gerontology and Geriatrics.

Investigating gender differences, communication and marital satisfaction in depression is important in order to design different intervention patterns for counseling and psychotherapy (Gabriel, Beach & Bodenmann, 2010).

Analysis of interviews

The interviews reveal that risk factors for depression in elderly people are as follows: chronic change in financial circumstances, change in role and loss of social status, disease, difficulty in adapting to illness, history of depression, and social isolation. These risk factors are similar to those from other research (Colasanti, Marianetti, Micacchi, Amabile & Mina, 2010).

Similar to the findings of other papers, the interviews identified that depression was correlated with a chronic deficit of communication between partners (Uebelacker, Courtnage & Whisman, 2003).

Women have a greater need for dialogue, while men tend to withdraw from this requirement. As it can be seen below, the interviews reflect that low communication and low marital satisfaction within the couple were associated with depression.

R.A.O. describes a successful couple relationship with his wife that illuminates an image of the future, emphasizing the importance of safe attachment and clear communication.

For M.G., the coping mechanism for low communication and marital satisfaction was avoidance, which deepened the lack of real, genuine contacts with her husband. At the same time, her sad, gloomy face with the downward look toward the ground supported the diagnosis of depression identified by GDS.

G.I. he expressed his permanent disappointment with her past and present life with an aggressive husband, and this situation is an obstacle to see the future with optimism. The depressive state of the past, for which she had taken medication, and the one identified in the study were reflected in her crooked body and deeply wrinkled white face.

R.C. related her chronically unbalanced couple relationship, an unsatisfactory relationship that darkened the future perspective with a husband she feels is cold and with whom she has no common interests. Her stiff, tense body and face, and careless appearance betrayed severe depression.

P.I. expressed his dissatisfaction about himself and the emotional ambivalence as a result of the medical condition; the behavioral, emotional and attitudinal changes have caused deterioration of the relationship with his wife. He had a depressive disorder due to the diagnosis of diabetes, which was also reflected by his very sad face.

The analysis of the interview also shows that where the interviewee had been diagnosed with depression, there was a family deterioration first at the level of cohesion, as expressed by disengaged and enmeshment, and second, at the level of flexibility, as expressed by rigid and chaotic. From the aforementioned accounts, it appears that family dysfunctions have contributed to participants' depressive states.

Conclusions

The decrease in professional and social interactions, together with the biological regression and fragility of elderly people, influence their family climate and psychological state. Psychological well-being influences the quality of the relationship between elderly couples, and the quality of these couple relationships influences psychological well-being.

The quantitative and qualitative results obtained through interviews show that there is a correlation between depression and physical health as well as between depression and family climate. These variables seem to be mutually reinforcing.

It has been determined that depression can contribute to dysfunctions within the relationship of a couple and family. This finding is especially painful as the depressed individual realizes that there is a link between his depressive state and his own family.

In the case of the elderly adults in this Romanian sample, the strongest variable to which both depression and the unbalanced functioning of the family were related was income level, followed by residence in a rural area. In the EU, approximately 80% of health spending is allocated toward chronic diseases, and the most affected population is over 65 years of age (Consiliul Național al Persoanelor Vârstnice, 2016).

Recovery, as well as tolerance to other disorders, increases when the patient is not depressed and has a positive psychological state. Therefore, the treatment of depression is especially important in the case of elderly individuals who have at least one diagnosis of coronary disease, such as hypertension, lipid metabolism, diabetes, coronary heart disease, cancer, chronic obstructive pulmonary disease, heart failure, stroke, chronic kidney disease, and osteoporosis.

There is never enough money for health policies to cover all needs. A solution would be to tailor these policies to vulnerable populations; in this case, elderly individuals predisposed to depression are those with low income, those living in rural areas, and those with imbalances at the level of cohesion, flexibility, communication and marital satisfaction.

The merits of this study are that it uses quantitative and qualitative data, that it identifies the socio-demographic risk factors of depression in the elderly, that it shows that dysfunctions within couples can lead to depression and that depression is detrimental to the couple relationship. This is the first time that the revised Circumplex Model (cohesion and flexibility dimensions) and the communication and marital satisfaction dimensions, as defined by Olson, have been used in the evaluation of elderly couples.

The main limitation is the small sample size that was unbalanced in structure. It is likely that because of this limitation, there has been no identification of statistically significant gender differences in depression and decreased depression toward the end of the third and fourth age, as has been found in other research.

List of abbreviations

GDS: Geriatric Depression Scale
FACES IV: Family Adaptability and Cohesion Scale IV
FACES IV Package: Family Adaptability and Cohesion Scale IV, Family Communication and Family Satisfaction scales.
Pearson's chi-squared test: χ^2
Kruskal Wallis test: K-W

Acknowledgements

The quantitative data of this study were based on the project "Quantitative and qualitative study on successful aging: A psycho-socio-medical approach on third age" made by"Francisc I. Rainer" Anthropology Institute of the Romanian Academy (No. 691/12.08.2015) and "Ana Aslan" National Institute of Gerontology and Geriatrics (No. 10413/01.09.2015) from Bucharest. The topic was approved by the Scientific Council of the "Francisc I. Rainer" Anthropology Institute of the Romanian Academy (No. 1021 / 04.11.2015). Project managers: Rada C. and Drăghici R. Participants: Ispas A.T., Baciu A.B., Prada G.I., Pena C., Vârtan I., Stan P., and Lazăr C.

The manuscript was edited for proper English language, grammar, punctuation, spelling, and overall style by one or more of the highly qualified native English speaking editors at American Journal Experts.

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Chapter 2

"We are no longer that active, but we do our best" – Perspectives on the Internet and health in the lives of Romanian seniors

Valentina MARINESCU[1]

Abstract

Previous research shows that seniors respond differently to mediated communication compared to young people. This chapter argues that Romanian seniors still consider online health-related information to be less reliable than interpersonal communication with their family doctor. At the same time, both young and elderly Romanians feel overwhelmed by the large amount of information available on the Internet, but seniors tend to remedy the problem by checking this information with medical staff. Whereas young people rely on the Internet as their main source of medical information, for seniors it is one of many possible sources. Additionally, unlike young people, seniors are less interested in managing their health issues on their own and are heavily dependent upon interpersonal communication with family doctors, pharmacists and friends.

Keywords: medical communication, Internet, social media, health, seniors, source of information, mobile telephony, youth.

Medical communication: interpersonal and mass communication that serves to convey health information.
Internet: an interconnected system of networks that transmit information in various formats (radio, television, mobile telephony).
Social media: online platforms used by people to enter into social relationships with each other.
Health: a state of physical, mental and social well-being characterized by the absence of illness and infirmity
Seniors: people who are over 65 years old, who no longer work for pay and who are retired.

[1] Faculty of Sociology and Social Work – University of Bucharest
Correspondence address: Valentina Marinescu, Faculty of Sociology and Social Work – University of Bucharest, Schitu Măgureanu, 9, 5th District, Bucharest, Romania, Zip Code 050711, Ph.: + (4021) 311.21.68; Fax: + (4021) 315.83.91; E-mail: vmarinescu9@yahoo.com

Source of information: a person, thing, or place where information is available or from where it is obtained.
Mobile telephony: a type of telephony that operates through portable devices with which users can make and receive calls by means of radio frequencies.
Youth: people aged between 10 and 24, between childhood and maturity.

Introduction

In today's interconnected, multimedial, and Internet-reliant world, all data points to a steady consolidation and increase in the use of mobile and Internet technologies: at the start of 2019, 56% of the world's population was connected, with 67% mobile phone users, 57% Internet users and 45% social media users (Pew Internet, 2018). Most of these individuals are teenagers and young adults; in fact, it is estimated that in the U.S., 95% of the youth have a mobile phone and 45% of them are almost constantly online (Pew Internet, 2018). In Europe the state of affairs is similar, Eurostat data from 2016 showing that most mobile phone users with Internet access (91%) are young people aged between 16 and 24, and this trend has been increasing in recent years (Eurostat, 2019). In Romania, official data from 2018 showed that there were no students over 16 who had never accessed the Internet, and 99% had accessed it in the last three months (National Institute of Statistics, 2018). At the same time, only 13% of older adults knew how to use the Internet, while in the European Union, the percentage was 45% (Eurostat, 2019).

Despite the widespread European preoccupation with aging, it is apparent that in Romania, there is little interest for studying the subject (Dascălu, Rodideal & Popa, 2018). The paucity of research devoted to it is compounded with the absence of statistical data on the situation of the elderly and a dearth of public policies targeting this age group (Bodogai & Cutler, 2014).

The rate of adoption of new communication technologies by the elderly in Romania remains very low. In 2017, only 68.6% of Romanians had access to the Internet at home, 64.3% in urban areas (National Institute of Statistics, 2017a). According to the same data report, various factors (not only in Romania, but also worldwide) have influenced the likelihood of having digital devices and Internet access, notably occupation and household income (90.9% of employed citizens had access to the Internet, compared to 42.2% of retirees) (National Institute of Statistics, 2017b). Furthermore, seniors living with younger relatives were more likely to use the Internet than those living alone. Finally, Romanians' use of new information and communication technologies decreases as they age (National Institute of Statistics, 2017c).

A study conducted by the National Council of the Elderly (2016) shows that Romanian adults aged between 20 and 60 consider that the elderly are plagued by problems such as limited access to medical units or medical treatment (21% of respondents), social and psychological vulnerability (31%), social isolation and loneliness (31%), age-based discrimination (39%) and low awareness of their rights (65%). When asked about their perception of seniors, respondents of the aforementioned study identified them with retirement pension (62.9%), inability to travel (54.8%), life experience (51.6%), illness (50%), loneliness (33.8%), dependence (29%), poverty (29%) and "being a burden to others" (19.3%). It is thus clear that for the most part, public opinion tends to be overrun by negative stereotypes where older people are concerned as a subject of public debate.

From the perspective of communication studies, Bol et al. (2014) show that older adults are often portrayed in the media as eternally young, active and rich, an image that stands in stark contrast to statistical and qualitative data about this demographic category. In addition to media representations of the elderly, much research has focused on the relationship between Internet use and seniors. As past research points out (Loos, 2012), seniors are eager to embrace new forms of media for their communication, including the Internet. However, seniors are also interested in using new social networks, such as Facebook among others (idem).

Analyses conducted so far reveal that seniors respond differently to mediated communication compared to young people (McMillan & Macias, 2008). Firstly, seniors engage in fewer online activities and have lower levels of digital literacy, including online health literacy (Campbell, 2009; McMillan & Macias, 2008). In addition, current studies indicate that there are major differences between the ways in which older and younger people use the Internet in particular and the benefits they associate with this invention, especially as a form of computer-mediated communication. (McMellon & Schiffman, 2002; Shapira, Barak & Gal, 2007; Gatto & Tak, 2008; Mellor, Firth & Moore, 2008; Karavidas, Lim & Katsikas, 2005).

The studies by McMillan and Macias (2008) and Campbell (2009) highlight some of the main characteristics of the online behavior of seniors. According to the former, people over the age of 65 use the Internet to send e-mails to friends and family (to socialize), to read (the Internet is an invaluable repository of text that is coming to replace libraries), or to prepare for a trip to the doctor. Among the factors that influence the way seniors use the Internet, research on this subject has identified superior socio-economic status, a high level of education (tertiary and post-tertiary) and belonging to the category of so-called "young seniors" (i.e. 65-70 years

old) rather than “old seniors” (over 85 years) (McMillan & Macias, 2008; Campbell, 2009).

Compared to the profusion of research on the risks and benefits immanent in the use of the Internet by children and young people, corresponding research on seniors is sparse. The list of the benefits of Internet use for the elderly, put together by McConatha et al. (2003), includes an increased level of satisfaction with life, improved mental welfare, a higher number of daily activities, and a lower level of depression. Other studies on this subject have identified benefits such as a feeling of belonging to the online world (Shapira, Barak & Gal, 2007), easier disclosure of emotions and feelings (McMellon & Schiffman, 2002), enhanced self-esteem (Gatto & Tak, 2008), the opportunity to multiply one’s personal contacts (Mellor, Firth & Moore, 2008), and to maintain social networks (Karavidas, Lim & Katsikas, 2005). In addition to the positive effects of new media on older people, research has, however, also drawn attention to several negative effects: decreased quality of life (Shiovitz-Ezra et al., 2009), reduced self-reported level of satisfaction with life (Consedine et al., 2013) and well-being (Chen & Feeley, 2014), and general health problems, of both the somatic and the mental variety (Cacioppo et al., 2002).

In recent years, increasing reliance on the Internet for health-related information has led to new challenges for the elderly. First of all, health-related information found on the Internet frequently employs terms unfamiliar to non-specialists and medical websites use scientific language much more extensively than traditional media. Additionally, many search engines fail to properly assess the accuracy and relevance of the information they display, which means that the information seniors are exposed to is of varying quality. A case in point would be online commercials for dietary supplements or even medications, as a specific form of direct-to-consumer advertising. As studies on this subject show (Marinescu, 2019), this type of communication, unregulated in Romania, has a series of negative effects, such as overmedication, discontinuation of treatments or even rejection of treatments prescribed by doctors. It is also worth noting that few computers are equipped with new features (touch screen, voice activation system etc.) that would enable seniors to use them more easily. Another disadvantage identified by Sommerhalder et al. (2009) is the information overload that the elderly now face due to the proliferation of online health-related information. On the other hand, in his study, Wicks (2004) notes that despite the increasing availability of online medical and health-related information, the elderly tend to resort primarily to interpersonal communication (with

GPs, family members, pharmacists, friends etc.) to resolve their medical queries.

Among the obstacles that the elderly encounter when using the Internet, Lambert and Loiselle (2007) have identified the limited access to online information on old computers, cheaper but slower Internet connections, limited access to new technologies and fewer technological skills, difficulties in using some computer features due to illness (for example, arthritis has an obvious impact on a person's ability to use a computer mouse), and difficulties in reading online information on a computer (Lambert & Loiselle, 2007).

Drawing on the existing literature (Campbell & Nolfi, 2005; Frederikson and Bull, 1995), we based the study laid out in this chapter on the following general assumptions (GA):

> GA1: The elderly use the Internet as a starting point for general health-related information, but when it comes to making informed decisions about their health, they adhere to the traditional model where the doctor has a central role.
> GA2: Patients who find online information about illnesses and treatments will refer to them in their conversations with family GPs or specialist doctors.

Material and methods

The main research method used in this study were in-depth interviews which took place between January 2017 and June 2018; the data was thus collected via face-to-face interactions. The interview guide contained thirty-one questions pertaining to the relationship between the Internet and health. All interviews were recorded and subsequently transcribed. The samples of participants were constituted by means of purposeful sampling (Patton, 1990), which favors the selection of individuals who can provide relevant and detailed information (Atkinson & Flint, 2001). The interviews were conducted as free, relatively open discussions, where, depending on the course of the conversation, there was room for additional explanations and questions alongside those planned in the interview guide. These discussions can be said to have been of an exploratory nature. In other words, we sought to acquaint ourselves with the phenomenon under study and to gain new perspectives on it.

The research sample of seniors consisted of 12 respondents (7 women and 5 men), aged 65 or over, who used the Internet not only to obtain daily information and to socialize with friends, but also to look for

health-related information. The first condition for being included in the study was having an age of 65 years or more. This chronological threshold was motived by several factors. First, we deem 65 to be the average age of retirement in the European Union, although there is admittedly variation between individual countries in addition to gender disparities (Finnish Center for Pensions, 2019). Secondly, according to the World Health Organization (2002), the chronological age of 65 is widely accepted as the onset of old age in developed countries, though not necessarily elsewhere (for example, in African countries). Thirdly, as Gonyea (2005) points out, in contemporary society we can no longer speak of a single category of elderly people, at least three distinct subgroups being relevant: "young old" (aged 65-74), "old" (aged 74-84) and "oldest old" (aged over 85). The second criterion for selecting respondents was their using the Internet at least weekly to search for information about their health and the healthcare system.

Table 1
Structure of the sample

Gender	Female	Male
Age	65-70, 71-75	65-70, 71-75
Number of people	7	5
Occupation before retirement	Teacher Technician Teacher Technician Doctor Accountant Economist	Engineer Technician Lawyer Teacher Teacher
Education	University High school	University High school
Place where the interviews were conducted	Bucharest	

The present chapter lays out the results of the thematic analysis of the data (Strauss & Corbin, 1990), starting with the open and axial coding of the interviews (Pandit, 1996). From a methodological point of view, open coding refers "to that part of analysis that deals with the labelling and categorising of phenomena as indicated by the data. The product of labelling and categorising are concepts – the basic building blocks in grounded theory construction" (for the latter concept, cf. also Strauss & Corbin, 1990). Closely following Pandit (1996), the data were initially analysed in terms of

questions such as “what”, “where”, “how”, “when”, “how much” etc. Subsequently, they were compared and similar information was grouped together under the same conceptual label. In the next stage, the primary concepts were subsumed under categories. Categories are distinguished by a greater degree of abstraction than their component concepts (Strauss & Corbin, 1990). While open coding segments data into concepts and categories, axial coding recomposes them; more precisely, it makes new connections between a category and its subcategories (idem). As a result, new categories emerge which stand in orderly, systematic relationships with the various concepts identified through open coding.

Results

As reported by Romanian seniors, one of the advantages of having access to the Internet is the diversification of information and services related to health that one can access. In the interviews conducted, most respondents stated that they sometimes looked for health-related information on the Internet, the most cited reasons being an upcoming medical appointment, the desire to better understand a procedure that their doctor had failed to explain during a medical consultation, or to learn more about products they had seen in television commercials. As for the way in which the elderly tended to search for health-related information online, they mostly used search engines (such as Google) and avoided specialized medical sites and blogs, as the following testimonies show (in order to preserve the respondents’ anonymity they have been designated with the letter "S" (senior) followed by an Arabic numeral (e.g. S1,"S2 etc.)):

> S1: In general, Google springs to my mind and that’s what I use, so when I search for health information, I google them [...] I find them on Google by chance or I come across medical information when I’m searching for something else. On the Internet, they pop up as ads on various sites. Google also has a simple system: if you type in a word, it will start giving you information all the time about similar sites or similar information based on what you've searched for before.
> S3: Google is the easiest to use. Whenever I’m curious about something or need information, Google is the perfect help. In general, I look up things and words on Google; I really like to surf the Internet and gather information from different sources.

The respondents’ main reasons for favoring online searches was that they are the easiest way to obtain information, that the Internet is easily accessible, and that it does not require special skills:

S5: I can’t explain it ... it's okay, it's more convenient, more usual.
S9: It’s more convenient and I feel comfortable with it.

They reported searching for new treatments for various diseases and a few of them also wanted to find information about hospitals, the medical system, and doctors in general.

S3: I mainly look for information about medications and diseases, but I’m especially interested in medications. Let's see… I look for natural ones, but I don't know if they’re any good.
S7: I look up diseases and medications, not hospitals... and not always for myself. Basically because I need to know more about these subjects.
S10: I look for information about medications, about doctors, and the effects that different treatments have on different people. I do this because I’m interested and I think it helps me to gain a deeper understanding of different diseases.

The analysis of the data shows that the subject least discussed by seniors in a regular medical consultation with their family doctor is precisely health-related information found online. Silence on this subject has led the elderly patients to continue searching for additional information online. On the other hand, the same silence has posed a potential danger, as seniors have ended up having no one to discuss the online information with, no specialist or medical authority to help them filter and better understand the information and make prudent decisions.

S6: As I was telling you earlier, most of the time my family doctor seems tired and bored. Whenever I’ve tried to talk to him about health information I’d found online, he wouldn't even let me speak. So I stopped asking, I stopped trying to get my doctor's opinion.
S11: No, I’ve never discussed health information with my family doctor. I wouldn't dare. I see information I find online as something for strictly personal use; my doctor doesn’t need to know.

It thus emerges that most patients simply do not dare to bring information found online into discussions they have with their doctors. Since the attitude of GPs in Romania is one of omniscience, seniors do not venture to present to them information from the Internet for fear of offending them, as can be seen from the testimony reproduced below:

S12: No, I’ve never discussed the information I’d found online with my family doctor. I wouldn't dare. I usually let him tell me what to do. No, no, I'm worried that he might see it as a lack of respect or mistrust in his knowledge, so I don’t even mention the fact that I look for health information online.

As for the respective values attributed by the elderly to information found online and face-to-face consultations with their doctors, the respondents in this study stated that whenever they had had a discussion with their doctors, they took his or her opinion into account, regardless of whether they had spoken to their family doctor or a specialist, and considered it to be the most reliable. Meanwhile, they had less trust in information found on the Internet and expressed doubts regarding it. This skepticism, as they stated in the interviews, is due to the “unscientific” nature of online information. Therefore, the respondents continued, when they encounter such information, they feel the need to turn to experts, i.e. to doctors. They also stressed that only the opinions and knowledge of doctors satisfy the criterion of scientific validity, their main argument being that doctors are not only medical experts, but are furthermore superior to an ordinary person in all respects.

S1: Yes, we had a discussion and the doctor reacted calmly and gently. He encouraged me to follow doctors' advice and not information I’ve found on the Internet. I believe that doctors are Gods on earth in a way. Doctors exist for the good of people.
S7: I mentioned some drugs and the doctor told me they weren’t good. He told me I just had to take what he gave me, not whatever I wanted. I think that’s a very fair reaction, because we seniors think about certain things the wrong way and it's not right. Clearly he’s [the doctor] the one that’s right.

While appreciating the utility of health-related information on the Internet, seniors rated its accuracy as inferior to that of information provided by doctors in face-to-face discussions with patients:

S4: Clearly, I don’t rely on the Internet and I don’t rely on information ... I mean, not only on the information I find on the Internet. The Internet is like a small room in a house, which is sometimes occupied, but sometimes it can be an empty room. Yes, it’s useful, but it’s not the only information available. You can

always find a doctor to discuss serious issues with directly and openly, instead of going on a wild goose chase on some blog or site.
S11: Yes, the information on the Internet can be reliable, but not completely. From where I stand, information from a doctor is the most reliable.

Nevertheless, several Romanian seniors admitted that they sometimes go through with medical treatments which they have found on the Internet. In such cases, as they stated, the treatments are entirely natural, not belonging to allopathic medicine, a scientific field which their doctors are versed in and in which they have full confidence:

S10: I asked for strictly natural remedies that I found on the Internet after talking to a pharmacist, for example liver medication such as Bilidren.

Another way that Romanian seniors use the Internet is to communicate with their family doctor or a specialist, for example via e-mail or Skype. Only three of the seniors interviewed reported doing so, and only under exceptional circumstances, since they otherwise call their doctors on the phone to avoid face-to-face interaction:

S8: I once tried to communicate with an ophthalmologist by e-mail and I did send an e-mail but I didn't receive an answer, not then and not later, even though I was insistent and tried to be as clear as possible about the problem that I had. So I went to see him and talked to him in person.
S10: I always talk to my doctor over the phone. I don't use Skype at all and I prefer talking over the phone in general. It feels more personal.
S11: No, I give him a call so he can book me in. I mean we talk over the phone or I go straight to his office.

In light of the fact that Romanian seniors mainly rely on face-to-face communication with their doctors and at the same time highly value their advice and the treatments they provide them and their families, it is unsurprising that they have minimal online contact with the healthcare system. Out of all the seniors interviewed, only one respondent stated that he had evaluated online the medical service he had received, only because he was particularly satisfied with it:

S3: I once wrote an online review for the clinic where I'd had cataract surgery. I was very pleased and gave them a high rating.
S9: No. I don't like broadcasting private discussions with my doctor and I don't think it's fair to disparage doctors and say nasty things about them.

Discussions

New technologies and information systems have the potential to empower patients, making them feel that they are in control of their destiny (Robinson, 2013). Furthermore, they render doctor-patient communication and the work of medical staff more efficient (Sullivan and Wyatt, 2005a, 2005b). However, despite technological progress, face-to-face communication between doctors and patients remains crucial for patients' health, and people who ask questions about treatment options or voice their preferences for alternative treatments are often healthier on the whole (Riley, 2015).

The data analysis showed that in Romania, there is no meaningful difference between young seniors (67-70 years old) and old seniors (over 85 years old) in terms of socioeconomic status as a determining factor in the use of the Internet to search for health-related information (Levy, Janke, & Langa, 2015). In fact, there was no indication whatsoever that sociodemographic variables such as age or level of education influenced the use of the Internet by Romanian seniors (Campbell, 2009; Macias & McMillan, 2008).

The thematic analysis of the interviews (Strauss and Corbin, 1990), in turn, led to the identification of four axial categories, as shown below:

Table 2
Open and axial coding of the interviews

Open coding	Axial coding
- Doctors know everything; - Information from doctors is reliable; - Face-to-face communication only; - Treatments prescribed by doctors only.	Only information from doctors is reliable and only the treatments they prescribe should be followed.
- Search for information on Google; - Information about natural remedies and treatments only; - Online information is not to be discussed with doctors.	The online health-related information consulted mostly concerns natural treatments and is not to be discussed with doctors.

The two axial codes led to the refutation of both general assumptions (GA1 and GA2) of our research, formulated at the beginning of the chapter. More precisely, the interviews revealed that Romanian seniors always browse the Internet and search for online health-related information directly through Google, and it is only by accident that they sometimes find themselves reading specialized medical sites. Despite their obvious interest in online health-related information, they are clearly loath to discuss this information with their family doctors. Thus, the data shows that Romanian seniors use the Internet as a starting point for general health-related information, but when it comes to making informed decisions about their health, they follow the doctor-centered model. As many as half of the respondents (six Romanian seniors) do not want to mention online health-related information to their doctor at all, their main reasons being the superior status that they ascribe to doctors and the feeling that such topics are not appropriate in doctor-patient interaction.

As the literature shows (Hinote, 2007; Milte et al., 2015; Pudrovska, 2015; Reitzel et al., 2013), an important determinant in health self-assessment is an internal health locus of control. The health locus of control refers to the extent to which individuals believe that their own behavior and lifestyle influence their health (Hinote, 2007; Wallston, 2013), the concept having received special attention in research on health promotion programs (He, 2014; Reitzel et al., 2013). Regarding the relationship between Internet use and the health locus of control, Campbell's (2004) study shows that older women who used the Internet to find health-related information had an internal locus of health control. On the other hand, in the study conducted by Campbell and Nolfi (2005), in which seniors of both sexes were taught to access health-related information on the Internet, there was no statistically significant correlation between an internal health locus of control and reliance on medical authority figures such as doctors or medical staff. However, in the present study, the results confirm Caress' (1997) hypothesis that the elderly have an external health locus of control, which means that they assume that their health is controlled by external factors and agents including more powerful individuals such as doctors. This was evident in respondents' claims that doctor's advice is much more reliable than online health-related information. In the same vein, the results of the present study confirm the assumption made by Breemhaar, Visser and Kleijnen (1990) that older patients are more willing to let doctors make decisions about their treatment.

According to our respondents, family doctors avoid discussing information from the Internet and also eschew explaining why they do so, which makes senior patients feel confused, disappointed and alone.

Moreover, by refusing to discuss online information with patients, family doctors in Romania are disregarding one of the greatest opportunities offered by the digital age, which would facilitate collaboration between doctor and patient, and fail to help patients understand the options available to them and become co-participants in their own treatment.

On the other hand, as said before, when Romanian seniors find information on the Internet about their illness and the necessary treatment, they are unwilling to ask their doctor about it. In this respect, the interviews failed to corroborate the argument presented by Mullen, Mains and Velez (1992) that there is a direct connection between the amount of online health-related information patients are acquainted with and the amount of information they request from their doctor. On the contrary, in Romania, the more seniors learn about their illness, the less likely they are to ask their doctor questions. This raises concerns about the reliability of online health information. If the elderly regrettably omit to call it into question or discuss it with GPs, they can expose themselves to danger, for example by buying drugs regarding which they have informed themselves primarily online.

The data also clarified some tendencies in Romanian seniors' use of the Internet to search for health-related information. Most importantly, they do not consider that online health-related information is as credible as that obtained through direct communication with their doctors. Thus, although they had knowledge of a great amount of information available on the Internet, Romanian seniors tended to ignore it, concealing this information in their communication with medical staff (family doctors, specialists or nurses). Another important finding of our study is that the elderly display a lower interest in taking control of their own treatment and remain heavily dependent upon interpersonal communication with family doctors, pharmacists and friends.

Conclusions

Romania ranks last in the European Health Consumer Index, with a weaker medical system not only compared to Bulgaria, but also compared to Albania and former Yugoslav republics such as Macedonia or Montenegro. In fact, Romania ranks thirty-fourth out of as many European countries whose medical system was analyzed for the calculation of the aforementioned index for 2018 (Health Consumer Powerhouse, 2019). In addition, since 2007, when it joined the EU, Romania has lost over 45,000 doctors who have chosen to practice in Western Europe (Nistoroiu, 2019). Another shortcoming of the Romanian healthcare system is revealed by the fact that in 2018, 13.2% of Romanians (the highest proportion in the entire

European Union) stated in 2018 that they could not afford long-term hospitalization (Health Consumer Powerhouse, 2019).

Under these conditions, making more alternative medical consultation systems, especially e-Health, available to various social groups could be desirable. It is obvious that Romanian society is attracted by these options, the 2018 European Consumer Health Index report indicating a significant increase in the accessibility of online appointments for Romanian patients (from a score of 2,750 in 2017 to a score of 1,857 a year later, 1 meaning widely available online appointments and 3 meaning none or almost none) (Health Consumer Powerhouse, 2019).

Globally, the use of the Internet by seniors has only become a research topic in the last decade (Chen & Persson, 2002; Czaja & Lee, 2007; Doh et al., 2015), and there are relatively few studies that have highlighted individual differences in Internet use within this age category (Ivan & Fernández-Ardèvol, 2017a, 2017b). The existing studies on Romanian seniors show that they are not a homogeneous group with respect to their relationship with the Internet (Ivan et al., 2017). Moreover, seniors' anxiety regarding computer use does not directly correlate with worse digital performance and a lower ability to use new communication technologies. Although it has been recognized that the Internet has become a social necessity, which helps us better understand the daily habits and practices of the elderly population in Romania, attempts to better understand the significance and usefulness of various online activities for citizens aged over 65 have remained sparse and inconsistent (Ivan et al., 2017).

In a meta-analysis of research on the relationships between the elderly, the Internet and health, McMillan and Macias (2008) consider the Internet to be a precious resource for taking care of one's health. Using the Internet for health-related purposes has been acknowledged as being beneficial also by Chaudhuri et al. (2013). Recent studies show that being active online makes seniors feel more informed and better able to manage their daily lives (Kelly, Jenkinson & Ziebland, 2013; Xie et al., 2014). Moreover, Internet use can improve seniors' overall health and has a positive effect on the relationships between senior patients and their doctors (Andreassen et al., 2006; Iverson, Howard & Penney, 2008). Finally, being active online can lead seniors to feel more satisfied with their lives, reduce their depression (McConatha et al., 2003), and enhance their self-esteem (Gatto & Tak, 2008).

In the present study, the analysis of the interviews revealed that older people use the Internet as a starting point for general health-related information, but when it comes to making informed decisions about their health, they follow the doctor-centered model of care. On the other hand,

when Romanian senior patients find information on the Internet about their illness, they are unwilling to ask their doctor about it. Thus, in the attitudes of Romanian seniors towards healthcare, we are witnessing the perpetuation of a paternalistic medical model, very far removed from the contemporary ideal of patient-centered medicine, also favored by technological progress.

The main limitation of our study is evidently the qualitative nature of the data collected, which does not allow us to make generalizations based on the results obtained. Thus, it was impossible for us to identify factors that favor a certain way of using the Internet to manage one's health within specific subgroups of the respondents on the one hand, and the obstacles encountered by the elderly in their exposure to online medical information on the other (Loos, Nimrod & Fernández-Ardèvol, 2018).

Another limitation of our research is that the study was conducted only in urban areas (more precisely, in Bucharest), rural respondents being completely absent from the sample. This shortcoming is significant in light of the quantitative research conducted in 2016 in Romania by Ivan and Schiau (2018), for example, which led to the identification of considerable differences among the elderly with respect to their use of their Internet depending on the environment they live in (urban vs. rural) as well as their level of education (primary vs. tertiary). More precisely, the study revealed that more highly educated older adults living in an urban area are more exposed to the Internet, while their less educated rural counterparts areas do not have the same access to the online environment and therefore do not even develop the skills needed to operate Internet applications on mobile devices, for example.

The fact that the study was conducted only in Romania is a third limitation that we can acknowledge. Indeed, transnational studies conducted on samples composed of seniors (Gallistl & Nimrod, 2019; Miller, 2019; Nimrod, 2019) show differences between media consumption in Northern and Southern Europe (Nimrod, 2019) and point out that older people have sociocultural needs and ways of using media that are shaped by the specific cultural context in which they lead their daily lives (Gallistl & Nimrod, 2019; Nimrod, 2019).

Despite all the inherent limitations, the present study may inspire some promising lines of inquiry regarding the relationship between the Internet and health in the case of Romania. Given that 424 localities in Romania have no family doctor and 1,098 localities have an insufficient number (Neagu, 2019), further research could strive to identify the sources of the introduction and the development of telemedicine and mobile health (mHealth) in areas with a disadvantaged population, e.g. elderly or economically struggling. A second avenue of research could be the way in

which Romanian seniors use specific mobile applications to manage their health. In this regard, it would be important to find out to what extent mobile health-related applications comply with the requirements of current gerontechnology and medicine (Pouliakis, 2019). Finally, a third direction for future research would be the possibility of integrating the elderly into the very process of producing online health-related content on the one hand, and even mobile health-related applications on the other (Hussaini et al., 2019).

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Chapter 3

Psychological solutions for the aging prophylaxis

Georgeta MITRACHE, Ștefan TÜDÖS[1]

Abstract

The psychological intervention with the purpose of aging prophylaxis is based on an integrating, systemic, and holistic approach of the individual, and accessing a superior level of knowledge by means of a multi, inter and trans-disciplinary methodology. The individual is analyzed from the perspective of its entire psycho-somatic, spiritual, energetic, and informational ensemble, and in constant interaction with the natural and social-cultural macro-system of his environment. The quality of life at the old age reflects the entire personal history of an individual; individuals have their own capacity of building and maintaining a high level of quality of life, determined by the manner in which they manage resources, and turn chances and opportunities to their advantage. As in the case of muscles, the brain can be trained, as well. The strategies aiming at stress management, adopting a healthier lifestyle, personal development etc. are based on learned behaviours, elaborated in ontogenesis, and, as such, behaviours that can be perfected throughout life, each day offering the chance of exercising and training said behaviours.

Key words: aging, lifestyle, eustress, distress, vulnerability to stress, resilience, immune-genic personality traits, coping strategies, optimization, optimization of performance capacity

Aging - phenomenon characterized by the functional decline of various organ systems, accompanied by a reduction of performances and bio-psycho-social capacities of a person, as an effect of getting older.
Eustress - a type of stress that solicits the body from a tonic perspective, having favorable effects such as: stimulating adaptive mechanisms, enriching the individual's variety of behavioral answers, replacing certain inappropriate behaviours with efficient ones.
Distress - "negative" stress, with toxic potential for the body, and which induces adaptation disorders.

[1] National University of Physical Education and Sports in Bucharest, 140 Constantin Noica Street, Bucharest, Romania
Correspondence adress: National University of Physical Education and Sports, 140 Constantin Noica Street, 6th District, Bucharest, Romania, Zip Code 060057, Ph.: +(4021) 316.41.07, +(4021) 316.41.08; Fax: + (4021) 312.04.00; Email: georgetamitrache@gmail.com

Resilience - represents the individual's capacity of facing hardships and adapting efficiently, even in troublesome, difficult, stressful times.
Immunogenic personality traits - an intricate personality trait system: cognitive, attitudinal, with a role in generating resistance to stress (and which is correlated with the positive tone of the immune system).
Coping strategies – these imply the active processes and the mechanisms used by an individual to dominate stress (to reduce negative tensions, and to regain "wellness", psychological comfort) or to avoid stress settling in.
Optimization - improvement (generally refers to maximization, however, there are cases when it refers to minimization, for example, minimization of toxic effects of stress). It is, in essence, a scientific undertaking (optimal projection, reasoning, calculation etc.). Optimization implies elaboration of several solutions, the selection of an optimal solution, and applying it. Personal development aims at personal optimization.
Lifestyle - the manner in which an individual chooses to live, expression of the emergence of the personality system, of individuality, uniqueness, and originality.

Introduction

"Third and fourth age" individuals (seniors) represent a significantly important resource, still very poorly valorized and developed, both at macro-social level, as well as at micro-social level.

A country's level of economic and social development is also reflected by means of the demographic indicators that express the mean life expectancy of a person (indicator: life expectancy at birth) or the number of years a person may enjoy, without limitations imposed by diseases or disabilities (Indicator: healthy life expectancy).

Life expectancy at birth "measures the average number of years that a person can expect to live based on current mortality rates (age-specific death rates)" (OECD/EU, 2018, p. 83). This is a very important indicator in appreciating the population's health condition, reflecting "rather accurately, the cumulated effect of medical care throughout several generations, depending on a complex of factors pertaining to economic development, standard of living, cultural traditions, with regards to medical care" (Voicu, 2002). Life expectancy at birth is one of the demographic indicators that characterizes the level of economic and social development of a country, as "the level reached by this indicator at a certain moment in time is the cumulated result of the economic and social factors, of the factors which influence the population's health, and of those factors that act on mortality at different intensities" (Institutul Naţional de Statistică, 2016, p. 8).

There is talk of a **multi-morbidity associated to the aging phenomenon** (the concurrent association of two or more chronic pathologies in the same person), there being a greater risk of multi-morbidity at senescence. "Chronic illnesses, infirmity, psychological diseases, and physical disabilities tend to become prevalent upon getting

older, determining the decrease in the quality of life of those affected" (Institutul Național de Statistică, 2016, p. 32), however, a series of diseases (which, in turn, may favor aging, as they determine the decrease of a person's performance capacity) may occur even during childhood or youth (such as arteriosclerosis). "Due to the disease, the patients must permanently adapt to the restrictive medical prescriptions, the limitation of effort capacity, or they must cope with chronic pain. These requirements generate stress, exhaust adaptive resources, and affect the feeling of personal value, as well as the auto-control capacity" (Holdevici & Neacșu, 2006, p. 218).

Healthy aging refers to maintaining the state of physical and psychological health, a person's performance capacity and their functional capacity, up to a greater age (Institutul Național de Statistică, 2016, p. 32). The **Healthy life years** indicator, "defined as the number of years spent free of long-term activity limitation (this is equivalent to disability-free life expectancy)" (OECD/EU, 2018, p. 86), aside from offering a general image upon the population's health condition, draws attention to the quality of life, as it reflects the qualitative side of years already lived. The increase of these indicators falls on the line of efforts made to increase a country's economic and social development level.

Anti-aging medicine aims at the prevention and prophylaxis of aging, even from adolescence, aiming at controlling and fighting against causes that determine normal aging and those that turn normal aging into pathological aging.

An aspect that is extremely important when aiming at increasing life expectancy, as well as increasing healthy life expectancy, is **education**. The statistical data indicate that **a high education level is correlated with a longer life.** As such, for example, in 2013, looking at the values of the life expectancy at birth indicator by education level recorded in 14 of EU's 28 member states, it is certained that "**persons with the highest level of education have a greater life expectancy than those with the lowest level of education.** For example, in Estonia, persons with higher education live approximatively 14 years longer than those with primary education, while in Bulgaria and Slovakia, they live 10 years longer. In 2013, the smallest differences between the life expectancy of persons with higher education and that of those with primary education were seen in Croatia (3.2 years), Italy (4.0 years), and Portugal (4.0 years)" (Institutul Naţional de Statistică, 2016, p. 13).

Throughout life, in order to face the aging phenomenon, people make constant efforts of developing performance capacity, personal development, permanent education and learning. The performance capacity "is the result of a process of perfecting the individual's executing

systems of which the biological and psychological systems are part, which, in turn, are constituted of sub-systems: morphological, functional (biomotor, cardiorespiratory, biochemical etc.), informational, decisional, psycho-regulating etc." (Epuran, 2001, p. 70).

The psyche has a central role in performance capacity. At the level of the human being, the psyche is the one that holds the fundamental role in the regulatory, communication, and control processes (in this respect, Romilă, 2004, considers that the psyche subordinates the neurological and metabolic), it is the one that "guides" human activity: it triggers it, supports it throughout its execution, and regulates it, aiming at the survival and adaptation of the human being, as well as achieving a state of physical and psychological comfort (as a subjective "feeling" of the result of the adaptive process). A well-adapted body is characterized by a general state of wellbeing, health, and total comfort (physical, mental, and social).

The psychological capacity represents "a system of particularities, states, and processes that guarantee the efficiency of the individual's activity. It presents itself as a specific individual, original synthesis, mainly conditioned by aptitudes, attitudes, and learning. The psychological capacity is the simultaneous efficiency of informational processes, of interpretative processes, and/or regulatory processes" (Epuran, 2001, p. 70). Synthesizing the different conceptual mentions that exist in specialized literature, we can characterize the psychological capacity by means of the following defining elements: it offers a person originality, individuality, uniqueness (Epuran, 1976; 2001); it is in direct relation with action, efficiency of the action, performance (Pieron, 1968; Epuran, 2001); it is in direct relation with competency, it is considered a possibility of competency (Prevost, 2007); aptitudes are considered to be a sub-layer of capacity (Prevost, 2007); "the maximum quantity of information that a cognitive system, either attentional or mnestic, can process or preserve" (Le Ny, 2006, p. 171); it can be emphasized through assessment, the test method being especially mentioned as a method of knowledge (Sillamy, 1998), however, certain authors believe that it can also be directly ascertained in an educational and/or professional context; it is developed under the influence of educational factors, and can be optimized.

The intervention at psychological level has ample effects, both at the level of the psychological capacity, as well as the level of the person's performance capacity, in general.

The purpose of this study is to elaborate a general model, based on psychological intervention means, with the purpose of aging prophylaxis, and prolonging healthy life years.

Material and methods

The complexity of the issue of aging prophylaxis implies an inter and trans-disciplinary methodology.

The creation of the psychological intervention program implies (Tüdös & Mitrache 2011, 2019) **the holistic, systemic, and integrated approach of the individual, at: biological level** (neuro-endocrine-metabolic), **motor, psychological (informational-energetic:** cognitive, motivational, affective, volition, psychomotor, personality**), spiritual** (philosophical, artistic, religious experiences etc.), and **psycho-social** level (which should aim at socializing, social integration, organizational integration, family integration, social support).

Approaching the psyche as a cybernetic system offers a series of benefits from a methodological standpoint, as it draws attention to its informational-energetic nature, the communication, command, and control functions it fulfills, the connections between its elements, the system's regulating, and self-regulating capacity (Popescu-Neveanu, 1978; Zlate, 2000; Golu, 1975; 2000). The systemic approach of the psyche also emphasizes certain characteristics of the psyche, such as: hierarchical organization and anti-entropic tendency, emergence and synergy. The principle of integration is defining for the system's activity: humans may be regarded, as such, as a cybernetic system, evolving, integrated within the physical, biological, and social-cultural macro-systems, and which aims at permanent adaptation and optimization of the behaviour by means of regulating-self-regulating acts (Golu, 2000; Zlate, 2000; Aniţei, 2010).

The present study is based on the method of scientific documentation, and on bibliographic study, as a theoretical scientific substantiation for the elaboration of the "System of regulating lines" (adapted from Tüdös, 2000; Tüdös & Mitrache, 2011), a general psychological model with the purpose of aging prophylaxis.

Theoretical framework

The aging phenomenon is defined as the functional decline (gradual and differential) of different organ systems, accompanied by a decrease in the person's performances and bio-psycho-social capacities, as an effect of aging. "Most evolutionary biologists define aging as an age-dependent or age-progressive decline in intrinsic physiological function, leading to an increase in age-specific mortality rate (i.e., a decrease in survival rate) and a decrease in age-specific reproductive rate (e.g., Medawar, 1955; Williams, 1957; Rose, 1991; Partridge & Barton, 1996; Tatar, 2001; Promislow &

Bronikowski, 2006; Flatt & Schmidt, 2009; Bronikowski & Flatt, 2010; Fabian & Flatt, 2011)" (Flatt, 2012, p. 148).

There is a series of theories on aging, such as: The rate of living theory of aging (Raymond Pearl, 1928), Hayflick's limit theory/Teoria limitei lui Hayflick, (1961), The Telomeres theory of aging, Neuroendocrine Theory and Endocrine (hormone) Theory (elaborated by Vladimir Dilman at the end of the last century), The Immunological Theory of aging, "Wear and tear theory" (elaborated by August Weismann, 1882), Free radicals theory (was first introduced by Dr. Gerschman in 1954, but was developed by Dr. Denham Harman, 1955; 1956).

The rate of living theory of aging (Pearl, 1928) states that the life expectancy of an organism depends on the exhaustion of a fixed quantity of vital substance (in a proportional rhythm with the metabolic rate); initially, it was believed that living organisms have a finite number of heartbeats, a finite number of breaths etc. Subsequent research on this theory demonstrates that "the theory rests on a weak theoretical basis and even on a series of highly nonplausible assumptions and that, furthermore, the evidence experimentally accumulated is, with a few odd exceptions, not in favor of the theory" (Lints, 1989, p. 36). The modern version of this theory admits that the number of heartbeats or the number of breaths does not determine the life expectancy of an individual, however, researches have focused upon the speed with which an organism processes oxygen. As such, species that metabolize oxygen more rapidly have a shorter lifespan compared to species that metabolize oxygen at a slower pace.

The theory of Leonard Hayflick on aging or the Hayflick limit theory (1961) states that normal human fibroblasts have a limit to the number of divisions: 40 - 60 divisions, after which, the cells die. The Hayflick limit proved to be in correlation with the telomere length (Burnett, 1974; Shay & Wright, 2000).

The Telomeres theory of aging refers to the fact that the cells of the human body are continuously renewed, however, as a person grows older and the cells divide, the telomeres become shorter and their integrity becomes weaker, and as such, the length of telomeres is used a means of predicting the future life of cells (Blackburn, 2000). Blackburn, Greider and Szostak, (2006) demonstrate that telomeres can be maintained due to telomerase, an enzyme that reestablishes lost repetitive sequences (beyond a certain life limit, however, neither the telomeres, nor the telomerase continue to be functional). "If the telomeres are shortened, cells age. Conversely, if telomerase activity is high, telomere length is maintained, and cellular senescence is delayed" (NobelPrize.org, 2009).

Research carried out by Elizabeth Blackburn demonstrates the fact that “individuals who have reached the age of 75 years have the chance of reaching (and, of course, exceeding) 80-90 years of age, as the telomeres in their cells no long shorten after this age” (Blackburn as cited in Constantin-Dulcan, 2019, p. 338).

The neuroendocrine and Endocrine (hormone) Theory (elaborated by Vladimir Dilman) considers that the nervous system (Brody, 1980) and the hormonal system are subject to wear in time, determining the occurrence of various diseases. Therefore, Dilman (1992) considers that it is possible that aging might be determined by the fact that the endocrine glands, while aging, secrete less and less hormones, while the circadian rhythm of hormones in the bloodstream becomes more and more chaotic.

Pierpaoli and Regelson (1994) emphasize the role of the pineal gland and of melatonin in increasing life expectancy, and in aging prophylaxis.

The Immunological Theory of aging (and "inflammaging") refers to the fact that the immune system is programmed to decrease with aging, thus determining the decrease of the body’s defense ability. “The theory holds that this increased diversification or cell mutation in old age may eventually lead to a failure of cell recognition and the breakdown of certain physiological systems, which ultimately triggers autoimmune-like reactions like chronic inflammation” (Stibich, 2019). It is believed that, around the age of 60 years, only about 5% remains out of the entire volume of the thymus on which our immunity depends (Constantin-Dulcan, 2019, p. 331). This leads to increased vulnerability in the face of infectious diseases, chronic illnesses, degenerative diseases, diseases with an inflammatory component, determining aging. “Many data in humans support the notion that age-associated immune dysfunction may, at least in part, explain the aging process. Explanatory power may be enhanced by combination with other theories such as the free radical theory“ (Fulop, Witkowski, Pawelec, Alan & Larbi, 2014).

The “Wear and tear theory”, elaborated by August Weismann (1882) considers that the cells, and, implicitly, the body, are affected by overload (Vijg & Kennedy, 2016).

The Free radicals theory (was first introduced by Gerschman in 1954, but was developed by Harman, 1955; Harman, 1956) “proposes that superoxide and other free radicals cause damage to the macromolecular components of the cell, giving rise to accumulated damage causing cells, and eventually organs, to stop functioning” (Kunlin, 2010). Free radicals are oxygen molecules that have lost an electron on the outer orbit of an atom, which makes them unstable. They will capture the missing electron from other proteins, lipids, DNA molecules, pathologically modifying their

functionality. Aging is considered a disease determined by the level of oxidant deterioration caused by free radicals that accumulated in the cells. When oxidant deterioration reaches a certain level, the cells can no longer survive (Stadtman & Levine, 2000).

According to the second law of thermodynamics (entropy law), in the Universe, there is a constant movement going from order towards disorder, the evolution of time rendering everything disorganized, and making everything self-deteriorate (Moldovan, 2014). Molecules of living beings dissipate energy, and, in time, they lose structural integrity and functional capacity, this process being perceived as aging by living organisms. Hildegard Meyer-Ortmanns (2014) believes that aging is a physical process, and not a biological one, and that it is governed by thermodynamics.

Living organisms have, however, an immense capacity of repairing errors and dysfunctionalities, up to a "critical mass" (Moldovan, 2014).

Although each species has a maximum lifespan (Leonard Hayflick), there are organisms that have been discovered to have survived millions of years. Anatoli Brouchkov and his collaborators succeeded in isolating bacterial strains from the ancient permafrost sediment (Neogene), which had been frozen for 3.5 million years. "Mechanisms of survival and growth capacities of microorganisms trapped in permafrost are still under discussion, but the very fact of their existence for thousands of years is evidence of their phenomenal viability" (Brouchkov et al., 2017, p. 541). One of these bacteria (non-pathogenic), identified as Bacillus cereus strain BF, and discovered in Yakutia, "was capable of enhancing longevity and immunity in Drosophila and mice, and showed probiotic activity on the mice Salmonella enterica model" (Brouchkov et al., 2017, p. 541). As a result of research carried out on animals, Anatoli Brouchkov and his collaborators believe that **there is a possibility that this bacteria could significantly enhance longevity in humans**, as well as offer information regarding the key of maintaining life over millions of years, in frozen form (Brouchkov et al., 2016).

When referring to the "genetic programming", we can state that each species has a maximum lifespan, and in the case of humans, **maximum life expectancy** is of **approximatively 120 years**, according to Colin Blakemore. And yet, within the limit of these 120 years, the manner in which a person ages, their health condition, and the level of their quality of life are decisively determined by **lifestyle.** For example, research carried out on twins (Baird, Osmond & Bowe, 1998) in the United States, Denmark, Finland, and Asia, has shown that almost 25% of the manner in which a

person ages if genetically determined, and the rest of approximatively 75% is determined by lifestyle, the choices and decisions one makes.

Psychological and spiritual harmony and wellbeing are the basis of physical and psychological health.

Often, however, a person's activities throughout life imply uncertainty, lack of safety, at times risk or threat, and in the context in which a person is involved in performance activities, we can imply a lack of time, space, results etc. All of these generate psychological tensions most often experienced as **stress.** "There is talk of **stress as a threat**, with an effect of telomere shortening, and **stress as a challenge**, without the shortening of telomeres" (Constantin-Dulcan, 2019, p. 344).

The specialized literature (Rosenman & Friedman, 1974; Rosenman & Friedman, 1977; Temoshok, 1987; Temoshok, 1990) mentions the link between a person's vulnerability to stress, and the risk of developing and maintaining highly severe illnesses, such as ischemic heart disease, cerebral-vascular diseases, or cancer.

As such, according to Friedman and Rosenman (1974), Rosenman (1990), there is a correlation between **vulnerability to stress and the risk of developing cardiovascular diseases** (ischemic heart disease, and cerebral-vascular diseases); in recent years, these diseases have been among the most aggressive - for example, in 2016, they held first place in the list of causes of death, respectively 79,401 cases among women (of 122,413 - the total number of death in the case of women), and 69,048 among men (out of the 134,063 - total number of death in the case of men), (Institutul Național de Statistică, 2017).

On the other hand, according to Temoshok (1987, 1990), an important link is that between **vulnerability to stress and the risk of developing cancer** (an illness also among the most aggressive ones; in 2016, for example, it held the second place in the list of death causes in Romania: with 21,084 cases among women (out of the total of 122,413 deaths), and 30,670 cases among men (out of the total of 134,063 deaths), (National Institute of Statistics, 2017, p. 90).

Under the aspect of vulnerability versus resistance to stress, there is a series of personality traits (such as resilience or immunogenic traits), or efficient coping mechanisms that characterize persons resistant to stress (Lazarus 1966; Lazarus & Launtier, 1978; Billings & Moos 1981; Lazarus & Folkman, 1984; McCrae 1984; Snyder 1999; Carver & Connor-Smith, 2010; Folkman & Moskowitz, 2004; Iamandescu Bradu & Sinescu, 2015)

Stress "concurrently designates aggressions exerted on the body (stressing agents), and the body's reaction to the aggressions. This reaction is non-specific, as it does not depend on the aggressor or the stressor"

(Dantzer, 2007, p. 750). Stress is perceived, from this point of view, as an imbalance with profound echoes both at body level and at psychological level, between requests and self-assessment of own capacities. "The holistic definition of stress points out that it is a very complex phenomenon affecting the whole person, not just the physical body, and that it involves a host of factors, some of which may not yet even be recognized by scholars and researchers" (Seaward, 2018, p. 6).

Stressors have a strong emotional, affective meaning. In dynamics, stressors may act successively, or they may interfere in their action, their effect being, however, additive, summative, cumulative (Tüdös & Mitrache, 2011, p. 62).

The psychological mechanisms intervene between the stressing factors and their effect upon the person, mechanisms elaborated during ontogenesis, by means of which the stressors' action upon the person is received and processed (the subjective assessment carried out by each individual).

Stress factors must find a certain **resonance** in the subject they are acting upon in order to "exploit" their stressing potential; that is why the stress level depends on a multitude of subjective factors, specific to each individual (Tüdös & Mitrache, 2011, p. 62). The specialized literature discusses a "**personal equation**" with regards to stress (Șchiopu, 1997).

Studying the implication of the psychological component in the case of ulcerative colitis (a disease that brings both physical and psychological pain, making patients predisposed to depression, and anxiety), Rada, Andrei, Ţieranu, Ispas, Diaconu and Baciu, (2017) believe that „the opinions regarding the causes and the evolution of IBD should not be polarized on the biological and genetic factors on the one hand and the psychological factors involved in pathogenesis on the other hand. For the benefit of the patients the opinions should be harmonized and all data, genetic, environmental, and psycho-emotional, should be integrated".

There are several characteristics of the stressing event that increase its toxic effect on an individual. A stressful situation is that when: demands are so many that they disturb information processing and, as such, determine a decrease in performance; the situation is perceived as dangerous, threatening etc. (sometimes, anticipating a threatening situation is more stressful than the situation in itself); the person is isolated; the situation is experienced as frustrating; social pressure induces a fear of failure, non-approval; it is correlated with situations/events that increase the body's vulnerability (Weitz, 1970).

The stressful event is even more harmful if the person lives alone, and it diminishes if that person can ask for help in moving past the stressful

event (from emotional or financial support, to professional help); the chances of finding a solution to the various problems increase when the person in question is habituated in consulting social networks (the person has a functional network of friends; knows how to access specialists that can be called upon for the resolution of various issues etc.).

Concurrently, the stressful event is more harmful if it generates internal conflicts (Kourilsky, 1963).

The stressful event is even more damaging the less it can be controlled by the person in question; **the level of control** that the subject has on the events, factors, stressful situations, and, especially, **the feeling of control** that the subject has with regards to the aforementioned, is reversely proportional to the level of the stress, as demonstrated by a series of scientific papers (Scand, 1998; Karasek, 1989; Legeron, 2003).

However, stress does not necessarily induce a pathological state. The occurrence of stress has its benefits as well: that of stimulating the adaptation mechanisms and those meant for coping with troubles, that of enriching and diversifying the subject's range of behavioral answers, and of replacing inappropriate behaviours with efficient ones. "The potential evolution towards a stress illness depends on the individual's coping and adapting abilities" (Gallo, 2006, p. 1184).

Depending on the positive or negative experience of the stressful event, and the intensity of the hormonal discharges, stress is differentiated as stress as a challenge, and stress as a threat.

Stress as a challenge is a type of positive stress (called eustress, term that tends to be replaced by "psychological well-being"), that solicits the body, having positive effects (positive tone). Eustress - represents the "state in which an individual perfectly controlling the situation finds himself/herself. Eustress is the opposite of helplessness, which refers to the negative reactions that appear when the situation is difficult to control (Dantzer, 2007, p. 750). This type of stress does not shorten telomeres. On the other hand, stress as a threat is a type of negative stress (called distress) with harmful potential for the body, that shortens telomeres, and induces adaptation disorders (Constantin-Dulcan, 2019).

Vulnerability to stress represents the characteristic trait of certain persons, that manifests itself through a sensitivity to a large range of stressors, and the predisposition of easily developing stress reactions (Hankin & Abela, 2005). Although it has the genetic determination as well, it is constituted throughout a person's personal history, depending on the psycho-emotional trauma suffered by a person, their experience in relation to stress factors that have had a major impact, the manner in which that respective person managed to cope with life situations, the personal

resources, personality structure, efficiency of coping strategies, the quality of social support etc. Iamandescu (1999) believes that psychological vulnerability to stress appears as an element that favors psychological diseases, or even the development of psycho-somatic diseases (when associated with an organic vulnerability), and is amplified by the conditions in which the person adopts a series of risk behaviours or associates with certain behavioral patterns (for example, type A behaviour).

It seems that certain personality traits correlate with stress vulnerability, such as: increased impulsivity, emotional liability, depressive tendencies, obsessive-phobic tendencies etc. (Iamandescu, 1999, 2002, 2015). Rada et al., (2017), while studying the intricacy of the psychological component in the case of a chronic illness (ulcerative colitis), underline the harmful effect of psycho-emotional stress in etiopathogenesis, and maintaining the inflammatory process (in the case of Inflammatory bowel disease, which comprises two main diseases: Ulcerative colitis and Crohn's disease). According to the same authors: „Anxiety and depressive disorders are more common in people with chronic diseases such as Inflammatory bowel disease and this fact may have a negative effect on the development of the disease" (Rada C., et al. 2017). Referring to the same disease (ulcerative colitis), the authors also show that the personality structure precedes the disease, the personality traits being subsequently exacerbated in the presence of symptoms; the patient often feels tense, and manifests "instability at the limit, tendency toward accentuation for emotivity and hyperthymia" (Rada C., et al. 2017).

Cardiovascular diseases represent the primary cause of mortality in Romania and in Europe. A series of authors (Rosenman & Friedman 1959, 1977; Booth-Kewley & Friedman, 1987) have underlined that there is a link between vulnerability to stress and the predisposition for cardiovascular diseases. They studied the relationship between personality, behavioral type, and cardiovascular diseases, suggesting that the type A behavioral pattern or "**the Type A behaviour**" represents one of the primary sources of predicting the development of a heart disease caused by stress. It was also called "type A personality", as the behavioral externalization is based on an ensemble of psychological traits, personality traits. These individuals are extremely ambitious and competitive, they get very involved professionally, they want to always be successful, they are hyperactive, simultaneously involved in several activities, they are in a constant battle against time, impatient, and have a low tolerance for waiting. They are characterized through restlessness and tension, which may create difficulties in life situations demanding a certain degree of relaxation, for example, when they have to resolve certain issues in a creative manner. They have a proclivity

for numbers, and a quantitative approach to phenomena. They also have an aggressiveness and hostility that are constantly kept in line (Bradu-Iamandescu, 2005; Pitariu, Miclea & Munteanu, 1987).

The **Type C behaviour** (emotional - inexpressive) was described by L. Temoshok (1987), based on the repression - vigilance dimension, and was correlated with a predisposition for cancer, which, according to the 2016 statistics, represents the second cause of death in our country. "A constellation of factors that appears to predispose some individuals to develop cancer more readily or to progress more quickly through its stages. These factors include (a) certain personality traits or coping styles, which were discussed under the rubric of "Type C"; (b) difficulty in expressing emotions; and (c) an attitude or tendency toward helplessness/ hopelessness" (Temoshok, 1987). The Type C behaviour is psychologically characterized by strong repression mechanisms; it has also been called "anger-in", due to the powerful repression of negative, hostile feelings (Popa-Velea, 1999). Usually, these persons are overweight, and have a poor diet (rich in sugars, fat, refined foods etc.). These are individuals who work overtime; who are subjected to severe stress, (to which they respond through denial and repression) to a chronic sufferance due to stress. They are calm, have a tendency of repressing their emotions, and can maintain harmonious interpersonal relationships despite the fact that, often, they have a feeling of lost hope.

As such, **the development of negative effects of stress and their gravity at the level of the individual differs from one person to another, depending on the individual particularities and the subjective experience.** Rahe & Arthur, quoted by Iamandescu (2002) emphasized the fact that there are three filters that diminish the harmful effects of stressor factors: 1) similar previous experience (as such, training has a significantly important role in increasing resistance to stress), personality traits, social support, and faith; 2) unconscious defense mechanisms, by means of which development of negative states such as frustration, anxiety, and stress can be diminished or avoided; 3) a person's conscious efforts (planning, organizing, information, relaxation techniques, recovery after effort etc.). According to Bruchon-Schneider and Danzer quoted by Iamandescu (1999), the primary factors that act as filters in stress development are "positive personal experience (training), positive immunogenic personality traits (hardiness, sense of coherence, optimism and sense of humor, locus of internal control), social support (including communication possibilities), demographic factors (young age, high social-professional status), minimal or absolute pathological psychological grounds" (Iamandescu, 1999, p. 56).

The concept of **coping** was imposed as a result of research carried out by Lasarus (1966), Lazarus and Launtier (1978), Lazarus and Folkman (1984), McCrae (1984) etc.; in the concept of the aforementioned authors, it designates the ensemble of mechanisms and behaviours that a person builds between him/her and the situation perceived as threatening, in order to control, diminish, or tolerate the harmful impact that the situation could have on his/her physical/psychological state of comfort.

Coping strategies (adaptation strategies), as opposed to defense mechanisms (defensive), are flexible, which indicates the decisive importance of an individual's education and the harmonious development of his/her personality in creating certain sanogenetic conducts.

A well-adapted body is characterized by a general state of wellbeing, health, and total comfort (physical, mental, and social). "The concept of adaptation has made it possible for researchers and practitioners to discuss more about the capacities, rather than the incapacities, about achievement, rather than failure, about health, rather than the state of disease. In many researches, adaptation has become the basis of a new orientations such as understanding and concern for health, treatment, and prevention of diseases" (Tudose, 2000).

Coping strategies imply the processes and the mechanisms used by an individual to dominate stress (to reduce negative tensions, and to regain "wellness", psychological comfort) or to avoid the development of harmful effects of stress. These are based on coping abilities; these are formed through repetition and learning, they can be efficient or inadequate, mature or immature, however, they can be perfected and new sanogenetic abilities may be formed as to replace those that are inadequate as a result of information, formation, learning, training.

Within specialized literature, coping is considered to be of a cognitive nature or of an emotional nature, both implying "centering" (a process of focusing and orienting all psychological energy towards another target): coping centered on the issue, and coping centered on emotion (Lazarus et al., 1984, Lazarus et al., 1987; Weiten & Lloyd, 2006). As a result, the defense strategies against stress involve acting directly upon the stressful situation (and indirectly upon emotions), and/or acting indirectly upon the emotion generated by stress. These may be achieved by various means (avoidance, vigilance, direct confrontation), such as: avoiding the stressful event or substituting said event with other types of activities that have a sanogenetic potential (physical and sports activities, games, relaxation etc.), assimilation and processing of the information through learning and training with the purpose of increasing a person's adaptation capacity, by modifying the subjective significance behind that event, by

orienting oneself towards positive thought content, optimistic attitude, by minimizing possible negative effects, through reasoning, finding a causal explanation, as well as the elaboration of action plans and certain active confrontation behaviours in relation to that particular stressful situation etc.

Type B behaviour is representative of a potentially healthy person. Individuals of this type are the exact opposite of Type A: relaxed individuals, calm, rarely rushed, who avoid becoming overwhelmed (overload), with a good tolerance of and a good adaptive capacity to aggressive environmental stimuli.

Resilience (the resilient process) represents the individual's capacity of facing hardships and adapting efficiently, even in difficult, stressful, unfavorable times (Luthar, 2003; Ionescu & Bouteyre, 2013). "The healthy brain has a considerable capacity for resilience, based upon its ability to respond to interventions designed to open "windows of plasticity" and redirect its function toward better health" (McEwen, 2016).

Locus of control (Rooter, 1966) is a generalized expectancy, that expresses the manner in which a person sees control upon the events of their life (the extent to which the person believes he/she can control their own destiny). Rooter, (1966) elaborates the internalization / externalization scale. As such, persons internalize when they consider themselves as having control over the events that are unfolding and externalize when they believe that others have control over what is happening to them. The "internals" see themselves (through what they do, what they are) as the "entity of control" over what is happening to them. The externals see it outside of themselves, in chance, destiny etc. The orientation of the internal control refers to a person's conviction that the results of his/her actions depend on what he/she does, and the orientation of external control refers to a person's conviction that the results of his/her action depends on the events that are beyond his/her personal control. There are no " completely internal" or "completely external" individuals; often, in certain situations, an individual may assume an internal control, and in others, an external control: for example, people often believe that personal success is due to the them, so they give it an internal position, and failure is given an external control position, considering it to be caused by others, by external conditions, by circumstance (Rooter, 1966).

Hardiness is considered a variable of personality (Maddi & Kobasa, 1984) associated to resistance to stress. "Hardy persons have a high sense of life and work commitment, a greater feeling of control, and are more open to change and challenges in life. They tend to interpret stressful and painful experiences as a normal aspect of existence part of life that is overall interesting and worthwhile" (Bartone, 1999, p. 73).

Immunogenic traits represent a group of cognitive-attitudinal traits that are correlated with the functional tone of the immune system, that "offers a biological support meant to ensure survival in extreme natural and social adverse conditions" (Iamandescu & Sinescu, 2015). These are: **self-efficiency and a sense of coherence** (Jungaberle & Grevenstein, 2013), **optimism, locus of control, psychological hardiness, self-esteem, humor** etc.

When the person adopts an unhealthy lifestyle, **risk factors do not usually act in an isolated manner upon the body, but in greater numbers, in a system, the harmful effect becoming worse within that lifestyle.** As such, not only does the person not avoid the risk factors with a potential of illness, but, most times, they promote said factors. "As shown by American epidemiologists, approximatively 30% of human pathology is determined by genetic factors, 30% by environmental factors, and 40% by lifestyle (...) Other researchers have shown that human pathology depends 20% on biological factors, 19% on environmental factors, 10% on the health care systems, and 51% on lifestyle" (Restian, 2010, p. 68).

Lifestyle represents "the personality unit organized based on a series of values that contribute to the cohesion of the self-image in the outside world" (Selosse, 2007, p. 745).

Stebbins, (2004, p. 65) defines lifestyle as "a set of behaviours that is determined by a coherent set of interests or social conditions, being explained and justified by a set of independent values, attitudes, and orientations, and which, under certain circumstances, becomes the basis of the shared social identity of those that execute it". Hankin, 2000, (as cited in Vasile, 2010) considers that lifestyle is a major factor in deciding of who lives or dies.

The efficient adaptation to the environment, the physical, psychological, and social well-being, the capacity of leading a socially and economically productive life, and of leading a meaningful life, are the effects of adopting a lifestyle that is organized on scientific criteria, one that is sanogenic, permanent education and learning playing a crucial role. There is an abundant amount of specialized literature regarding psycho-prophylactic measures that aim at shaping a healthy lifestyle.

Edward P Sarafino (1994) underlined a series of sanogenic behaviours such as "sleeping for 7 to 9 hours; eating breakfast regularly; no eating between meals; maintaining one's weight within normal limits; no smoking (active and passive); only occasional consumption of alcohol; exercising regularly" (Sarafino quoted by Iamandescu, 2005).

Iamandescu (2005) systematizes **7 categories of contemporary sanogenic conducts in the healthy adult:** 1) **Daily habits** (such as: oral

hygiene, breakfast, physical activities: gymnastics, walking, sufficient sleep); 2) **Diet**; 3) **Accident prevention behaviours** (such as: having a preventive behaviour against car accidents, for example: wearing a seatbelt, not speeding, not consuming alcohol); prolonged unprotected exposure to sun (between 10:00 - 16:00), avoiding contact in case of severely contagious diseases etc.; 4) **Avoiding excesses** (alcohol, medication, food excesses, sleepless nights); 5) **Regular medical exams**; 6) **Self-examinations**; 7) **Total prohibition** (tobacco, drugs, self-prescribed antibiotics or psychotropic drugs, use of another person's personal hygiene objects). (Iamandescu, 2005).

"The REALAge rejuvenation program. How to look younger and live longer" elaborated by Michael F. Roizen (2010), moves forward from the idea that the real age reflects in a more accurate manner how much the body has aged, compared to the calendar age. The author elaborated a calculation instrument for real age, and then indicated over 70 solutions for reducing said age, and for aging prophylaxis.

The **NEW START** program (Thorp, quoted by Iamandescu, 2002), comprises psycho-prophylactic recommendations that aim at educating a lifestyle by means of an integrative approach of the individual, as it acts both at physical level, and at psychological and spiritual level. The program's denomination is an acronym composed of the initials of eight important factors that condition health: **N = nutrition; E = exercise; W = water; S = sunshine; T = temperance A = air; R = rest; T = trust in God.**

Results

The present study takes form through the elaboration of a general model of psychological intervention with the purpose of aging prophylaxis, called: "**The system of regulating lines**". It is made up of seven modules (each being destined for a "regulating line"), classified under an action system moving forward from the integration within the natural-cosmic environment, to the integration within the social-cultural environment (educational, professional, etc.). By means of these modules, it aims at the complex, systemic intervention at both psychological (cognitive-sensory, logical, intellectual, emotional-affective, motivational, volitional, personality, spiritual) and psycho-social level, as well as at physical, motor, and psycho-motor level. The systemic approach of these "regulating lines" emphasizes the **connections between them**, the beneficial effects of the intervention, based on the elements' **synergic action.**

The general model of psychological intervention with the purpose of aging prophylaxis: The action system of the "Regulating lines" (adapted from Tüdös, 2000; Tüdös & Mitrache, 2011, 2019).

Scheme 1. General objective of the "Regulating lines" System

- Organizing life with the purpose of promoting personal values (meaningful life), educating the person's axiological system;
- Unconditional acceptance of oneself;
- Promotion of permanent education, self-education, permanent learning throughout life;
- Orientation towards practicing certain activities in which performance may be favored by life experience (gained as a result of growing older);
- Development of the motivational system that supports optimization of performance capacity;
- Development of self-awareness, becoming aware of one's strengths and weaknesses;
- Educating the rational thought style;
- Orientation towards positive thought contents;
- Development of imagination and creativity;
- Educating the assertive communication style;
- Development of resilience;
- Development of mature and efficient coping strategies;
- Consulting the specialists in the field (physician, nutritionist, kinetotherapist, specialist in physical education and sports, nature medicine specialists etc.) who will support adopting a lifestyle organized in scientific criteria; promotion of educating a lifestyle based on scientific criteria;
- Construction of a social support network (a network of friends and specialists);
- Developing the habit of systematically doing exercises;
- Systematically practicing hobbies;
- Developing routines (for example, pertaining to sleep optimization, nutrition, and hydration, exercising);
- Observing certain established hours (for example, the time at which one wakes up, and the time at which one goes to sleep; meal hours; exercise hours);
- Scientific organization of effort and recovery, as well as of the relation between them.

Scheme 2. Methods and means of the "Regulating lines" System

- Demonstration, explanation, persuasion, suggestion;
- Keeping a journal;
- Breathing techniques;
- Psycho-somatic relaxation techniques;
- Mindfulness exercises;
- Mental training;
- Meditation;
- Concentration techniques;
- Mental control techniques.

Scheme 3. General indications

- You can begin at any given time to change your unhealthy lifestyle and transform it into a lifestyle elaborated on scientific criteria, that will support your efforts of personal development, psychosomatic optimization, and aging prophylaxis!
- Any intervention at psychological level implies regulation and self-regulation!
- Use your strengths and try to improve your weaknesses!
- Establish and fulfill personal projects (which are achievable)!
- Every day is a training in order to optimize your lifestyle!
- Each person is unique and original, that is why you consult specialists so as to, on the one hand, obtain personalized programs adapted to you, and, on the other hand, so as to benefit from a personalized method of achieving these programs!

Module 1
"Regulation / self-regulation line by means of the adequate external use of natural environment factors"

The objectives and tasks of module 1 refer to: using elements from the external environment with a prophylactic and therapeutic purpose; orientation towards consulting specialists in the field with the purpose of practicing various complementary therapies, such as: hydrotherapy, crystal-therapy, heliotherapy, mountain therapy, thalassotherapy etc.; organizing daily schedule based on scientific criteria (the relationship between physical activity - intellectual activity - recovery/rest/quiescence); organizing one's schedule so as to respect the body' synchronizing rhythm with those of the natural environment; increasing recovery capacity over sleep (consult a sleep specialist); orientation towards consulting specialists as to organize the microclimate (personal living space, and the physical and technical

environment in which one carries out activities) based on scientific criteria, and based on ergonomic and ecological principles.

Comments:

Human beings are a living system that develops by integrating oneself into an immense ecosystem constituted by the cosmic environment and the natural terrestrial environment. The life of each person is a cosmic event, and each human being may be perceived as an informational-energetic system that is constantly communicating with the external environment. Throughout life, a person influences the natural environment in which it lives, and in turn, it receives a multitude of geophysical and cosmic influences. Terra, the life sustainer, is, too, alive.

The quality of the surrounding environment and the quality of a person's integration in said environment influences the person's quality of life and health in an absolute manner.

Using natural environment factors in a prophylactic manner and in order to optimize performance capacity, harmonize life schedule (lifestyle) with the action of cosmic - telluric factors, aids in better managing the bio-psychological resources, given their fundamental determinism in a person's development and evolution.

Eco-psychology (founded by Roszak, 1992), which appeared as an intellectual movement that studies the relationship between man and the world, "adds value to the human nature by including it into the universal harmony, renews the contact with Terra and with life, with the purpose of achieving better self-awareness" (Radu-Tomșa, 2000, p. 16).

Substantiations:

Natural environment factors used both with a prophylactic, therapeutic purpose, and for the development of performance capacity, may represent exceptionally efficient solutions if used scientifically and adapted for the person in question.

Climatotherapy (Iețcu, 1987) is a method that uses natural environment factors (cosmic factors, telluric factors, meteorological factors, biological factors), such as climate, for prophylactic and therapeutic purposes in order to maintain, improve the body's health, or to develop performance capacity. "Climatotherapy may be used as a unique method, or in association with balneotherapy or other natural factors. The following methods may be used in climatotherapy: air and heliotherapy (in the sea, rivers, lakes), natural treatments (heliotherapy, thalassotherapy, and, at times, cold mud applications using the Egyptian method)" (Iețcu, 1987, p. 164).

Hydrotherapy is a branch of medicine that uses the external application of water in prophylactic or therapeutic purposes. "All forms of therapy that use hot or cold water in order to treat various conditions are reunited under the name of hydrotherapy" (Dumitraşcu, Munteanu, & Lăzărescu, 2012).

A significant curative value is held by **crenotherapy** (or thermal therapy), which uses mineral waters externally (partial or total baths) and internally (indicated at the regulation through consumption line), in order to positively influence the body and psyche. Mineral waters (used for external treatment), therapeutic muds, heliothermic lakes, pits.

Thalassotherapy refer to using marine climate in a therapeutic manner: sea water, algae, marine muds, sand on beaches etc. Heliotherapy means exposing the body to the ultraviolet solar rays (sunbathing).

Mountain therapy (altitude therapy) refers to using the mountain climate in a therapeutic, and also prophylactic manner, or as to develop performance capacity.

Biorhythm represents an expression of human adaptation to the variations of the natural environment. In order to survive, the human body, as is the case of all living beings, must be subjected to the periodical variations existent in nature (light, temperature, humidity, atmospheric pressure, electricity, currents variations etc.), with which it must synchronize its life. **Bio-periodicity** is the adaptive answer of a living system to the aforementioned. Life on Earth, and, in consequence, the life of human beings as well, unfolds according to certain rhythms imposed by the succession of seasons, days and hours etc., and, in the case of living systems, the energy course within an organism is modified based on these, as an expression of integrating within the natural environment. The capacity of perceiving the rhythm develops in the child even from the intrauterine period, as an echo of its mother's heart beats.

The natural and social macro-system acts upon the human being through **synchronizers**, factors (such as light, temperature, social relationships) which impose the frequency of biological functions, determining their rhythm. "In the 1950's, German biologist J. Aschoff gave the rhythm synchronizers the name of Zeitgeber ("time giver"). The alternation between light and darkness is an immensely powerful synchronizer that regulates numerous activities of living organisms, and modifies them depending on the lighting conditions" (Leconte, 2006, p. 1123).

Rhythms "constitute regular events that affect the lives of individuals, according to certain cycles (...) A biological rhythm can be described as an oscillating system within which identical biological

activities take place, at equal intervals or periods of time" (Pouthas, 2006, p. 1046, 1047). The following may be differentiated at the level of the human being: an endogenous rhythm (genetically fixed, dependent on the activity of an internal oscillator in a determined period of time), and an exogenous rhythm, imposed by external factors, such as light and temperature (Campan, 2007, p. 683). The biological rhythms are endogenous, "in other words, there is an internal mechanism in our body that is responsible for this rhythm" (Leconte, 2006, p. 1047), however, external factors may intervene and alter the periodicity of these rhythms through synchronizers.

Special attention must be paid to the sleep-wake biorhythm and the quality of sleep. The **sleep-wake biorhythm** has a periodic character, is determined genetically, and is dependent on Earth's rotational movement around its axis.

While sleeping, the organism becomes a predominantly closed system, as opposed to the alert state, and more commonly, the wake state, characterized by activism and lucidity.

The sleep-wake rhythm is different throughout life. In the case of newborns, sleep takes up more time than in the case of adults, varying from approximatively 17 hours to approximatively 13 hours at the age of 6 months. Newborns have a rhythm with two short periods of sleep during the day, and a longer one during the night. In adults, the sleep period is of approximatively 8 hours per night, however, some individuals require less sleep. Atkinson, Atkinson, Smith and Bem (2002) believe that approximatively 90% of adults sleep between 6-9 hours out of 24 hours. It seems that there is a tendency in which the sleep period becomes shorter as a person ages. Therefore, the quality of sleep and observing sleeping hours while growing older are extremely important.

Two cycles were emphasized during sleep (Dement & Kleiman, 1957): slow-wave sleep (non-rapid eye movement or NREM) and paradoxical sleep (REM state - rapid eye movements). During the first hour of sleep, the subject goes from stage 1 to stage 4 in a successive manner. These 4 stages are called non-REM (NREM). The first stage is characterized by the appearance of alpha waves, stage 2 characterized by the appearance of spindles, where sharp peaks and descending slopes were emphasized within the electroencephalogram's entire "ensemble", and then, the 3 and 4 deep stages (during which the subject is difficult to wake up), that are characterized by slow waves (delta). Dreams apparently occur during REM or paradoxical sleep. After approximatively one hour, we see REM sleep. "The paradoxical sleep represents approximatively 20% of sleep, and slow-wave sleep represents 80% of the entire sleep period. The slow-wave sleep

predominates at the beginning of the night, while the paradoxical one, at the end of the night" (Marele dicţionar al Psihologiei, 2006).

Apparently, the sleep cycle patterns also change with age: as such, Gillin (1985) believes that newborns spend half of their sleep time in REM, a 5 year old child spends 20-25% of its sleep in REM, and adults spend 18% or less of their sleep period in REM. The elderly seem to enter the 3rd and 4th stages of sleep rarely and give up sleep for a better part of the night, and more frequently than individuals of other ages. Atkinson, Atkinson, Smith and Bem (2002) characterize "REM sleep as a brain that is largely awake, in a body that is unable to move, and NREM sleep as a low cerebral activity in a very relaxed body".

In the case in which the sleep is not qualitatively satisfactory, or it is insufficient for organism recovery, reference may be made to the existence of a sleep disorder.

The sleep-wake biorhythm has a significant importance for an individual, as it **coordinates most circadian rhythms.** This biorhythm probably is the one that determines that human performances during the day be superior to those carried out during the night. As such, Şteflea (1984) believes that performances reach maximum peak between hours 9-11 and 17-19, that they are somewhat diminished between 13 and 14, and the lowest rates are recorded at night, between 3-4 (the moment believed to be critical from a biological standpoint).

The results of a recent study carried out at the Boston University in Massachusetts underlines the fact that, during sleep, the **cerebral-spinal fluid enters and exits, in waves, helping the brain in eliminating "waste".** "Sleep is essential for both cognition and maintenance of healthy brain function. Slow waves in neural activity contribute to memory consolidation, whereas cerebrospinal fluid (CSF) clears metabolic waste products from the brain" (Fultz et al., 2019). A team of American researchers have emphasized that "a coherent pattern of oscillating electrophysiological, hemodynamic, and CSF dynamics that appears during non–rapid eye movement sleep. Neural slow waves are followed by hemodynamic oscillations, which in turn are coupled to CSF flow. These results demonstrate that the sleeping brain exhibits waves of CSF flow on a macroscopic scale, and these CSF dynamics are interlinked with neural and hemodynamic rhythms" (Fultz et al., 2019).

Within a normal circadian rhythm, once nightfall comes, during sleep, the pineal gland releases melatonin which influences the body's well-being and longevity. "If aging is a neuroendocrine programed event, the role of the pineal in governing circadian and circannual rhythms, pubertal development, and seasonal sexual cycling suggests that it may have

a place in the programing or prevention of senescence" (Pierpaoli & Regelson, 1994, p. 789).

Among the known positive effects of sleep, we mention: relaxation, recovery, physical and psychological regeneration, and fatigue prevention. "It is believed that fatigue development is connected with three major factors: deficiency of a sleep - defined by duration of previous wakefulness and a sleep, time-of-day and at last, task-related factors" (Dorokhov, 2013, p. 33). Sleep helps the brain process, organize, and reorganize the immense volume of information received while awake, and, concurrently, it mends and "repairs" what was deteriorated during the activity carried out while awake; it supports the creation of connection between the different sub-systems of the psyche, such as, for example, between emotions and thoughts that help harmony and psychological balance.

It is important that what man makes and builds (the elements of the technical environment) integrates in a harmonious manner with the natural environment so as to support quality of life and favor the health of those that use them. Crăciun (2008) has holistic view on integrating the human being in the external environment (seen as a complete environment: natural, technical, and social). "The actual urban material and energetic metabolism is a concept that considers both the mutation and the exchange of substances in an urban body, similar to both the biological metabolism and energetic metabolism, as information expression… The energetic metabolism level forces us to understand energy and control the living spaces of the human informational network, connected through the human factor and the plant factor, which becomes a major element in the metabolic-urban relation between man and city" (Crăciun, 2010, p. 7). He elaborates a model of the "Man covered" by several membranes which, without isolating (by analogy with the cell membrane), ensure an interior-exterior, micro-macrocosmos succession, determining the integration of the human being within the external environment. As such, the first layer is represented by its own biological layer: The skin; the second protection layer is Attire/Clothing; the third is represented by Home/House/Architecture; the following layer is Community - City/Human settlements/Urbanism, and the following layers are at a macro level - the Planet / Universe and the Cosmos. An individual's health, quality of life are profoundly influenced by the manner in which these membranes succeed in fulfilling similar functions to those of the cellular membrane: delimiting and compartmentalizing, shaping, permeability, metabolic function, but, most importantly, the regulation / self-regulation function and the informational communication with the external environment function (Crăciun, 2008).

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS
- IN SHORT -

Form your own habits and routines regarding both the effort regime and the recovery one, in order to obtain consolidation and amplification of efficient states of sleep, rest, and activity.

Establish certain hourly points of reference for daily activities, for example, meal hours, sleep hours, physical exercise hours etc.

Sleep is of a vital importance for the body, and its quality is essential for the aging prophylaxis. Avoid intense physical effort before sleeping. For a restful sleep, organize the room in which you are about to sleep: it has to provide safety while you sleep. It must be well ventilated. If it is possible, and only if it is not dangerous: turn off (or cover) any source of light, even the TV led, the computer, outlets etc.; disconnect any electronic devices in the room, avoid using artificial smells (perfumes, room deodorizers etc.). Try to respect the sleep interval from 22:00 to 6 in the morning. The psychological state that characterizes the moment that precede sleep is particularly important for its quality; amplify the state of relaxation using a psycho-somatic relaxation technique before sleeping. Furthermore, due consideration must be paid to the moments that follow immediately after waking, as these can influence the entire day.

Respect rest days and holidays. Find your hobbies and practice them!

Consult specialists in the field so as to **practice various techniques that use environmental factors as external regulatory factors with a prophylactic, therapeutic purpose, or for physical and psychological optimization, and the increase of performance capacity; such techniques are: crystal-therapy, mountain therapy, thalassotherapy, phytotherapy etc.**

Pay due attention to the living space and the workspace. Organizing them based on these ecologic, ergonomic, and aesthetic principles (light, temperature, humidity, radiations, shape and color, functionality, noise level), **space personalization** can create a healthy and pleasant climate, that will support effort.

Module 2
The "Regulation/self-regulation through consumption line"

The objectives and tasks of module 2 refer to: consulting specialists with the purpose of using external environmental elements for internal use (consumption) with a prophylactic and therapeutic purpose, as

well as in order to develop performance capacity; orientation towards consulting specialists in the field with the aim of optimizing breathing, use of water as an internal regulating factor, organizing diet based on scientific criteria etc.

Comments:

By using external environment factors for consumption (by breathing, hydration, nutrition etc.), they bring information and energy within the body, which represents the essential manners of regulating and self-regulating, both physically and spiritually. The quality of the consumed elements is especially important, as is the manner in which they enter the body. Aside from educating a person with regards to those elements that that person needs, and which satisfy the body's needs to the largest extent, it is also necessary to educate the person with regards to the manner in which they may be consumed. As such, the air quality and breathing, water quality and hydration, foodstuffs quality and nutrition are determining elements of the quality of life and affecting them in any way has negative effects for the person, determining physical and psychological disorders. They have to be educated based on scientific criteria by the specialists in the field, so as to form habits that will support correct breathing, correct hydration, correct nutrition, and their correct integration within a healthy lifestyle.

The quality of life and the quality of physical and psychological health depend to a great extent on the development of certain habits. In order to enhance their efficiency, they can be carried out synergically, with basic motor habits, such as, for example, coordination between running and walking, jumping (Predoiu, 2016).

We recommend learning breathing techniques, various nature treatment procedures that use breathing (aerosol therapy, air therapy, respiratory kinetotherapy etc.), hydration, or seeking specialist guidance.

Due attention must be paid to diet. Each food that is assimilated influences health and balance, either regulating or disturbing the body's function, and that is why we recommend that a specialist create a personalized diet etc.

For man, hydration is one of the most important conditions of maintaining health, and physical and psychological fitness throughout life. A series of researches underlined the fact that water has remarkably interesting properties. For example, Emoto (2004, 2005) emphasizes water memory, its capacity to perceive, record, and react to external influences, such as human bioenergy, various informational or electromagnetic fields.

We specify that regulation/self-regulation can be achieved both through consumption and non-consumption (for example, conscious,

progressive apnea during certain specific exercises, fasting, partial or total fasting etc.).

Substantiations

The quality of air and breathing are decisive elements with regards to quality of life and affecting them in any way has negative effects for human beings, determining somatic and psychological disorders (the nerve cell being the first one that suffers irreversible transformation due to a lack of adequate oxygenation). If the air is clean, then correct breathing shall have as effect energy assimilation, regeneration, the balancing of the body, increasing the level of awareness both from a physical and a psychological and spiritual point of view.

The air in big cities (as a result of industrialization and traffic intensification) contains a series of pollutants, of which the most frequent are nitrogen oxide, sulfur dioxide, carbon monoxide, lead, volatile organic compounds, suspended particles etc.

Certain studies (Abel, Gubernski & Dumitriev, cited by Becea, 2003) demonstrated that even the air from the air conditioning can be of a questionable quality due to the lack of two elements in its composition: ozone and negative ions, thus leading to increased fatigue, depressive states, and favoring sickness such as colds, rheumatism, and cardiovascular disease.

Animals, as opposed to humans, have a method of breathing correctly. With regards to humans, it seems that the most adequate breathing is seen in children during their first months after birth. The quality of the act of breathing is, however, lost as neural demands and the level of stress increase, and physical effort decreases. Breathing decreases in depth and amplitude. The effect of this phenomenon is insufficient oxygenation of the body, various neurovegetative disorders, a tendency to slowly get tired, decrease of vitality and dynamism etc. A series of other negative effects may also appear, such as: headaches, attention liability, insomnia, asthma etc. Therefore, practicing breathing exercises (such as Yoga) has had beneficial effects both on the improvement of the health of the respiratory system, and, as a result, of the entire organism, and psychologically referring to emotional balance, development of attention capacities, stress management, anxiety management, depression management, relaxation etc.

In order for these breathing exercises to be truly efficient, it is recommended that: the air be clean, the nasal be cavities be opened, the muscles involved in breathing be trained.

Among the most known therapeutic procedures that use breathing: **aerosol therapy, air therapy, respiratory kinetotherapy, oxygenation,**

and negative air-ionization (natural and artificial). As such, **aerosol therapy** is a natural therapeutic procedure that uses aerosols (liquid or solid suspensions in a gas environment). These are found naturally (at the seaside, in salt mines, in forests), or can be artificially produced. **Air therapy** refers to the beneficial effects of air from room ventilation, respiratory gymnastics performed in areas with clean air with ozone and activated negative ions: seashore, forests, gardens, parks etc. **Respiratory kinetotherapy** refers to a therapeutic procedure that "uses breathing exercises with the purpose of improving breathing, using a much greater percentage of lung capacity, of functional recovery of certain organs, and of healing or diminishing certain illnesses" (Cîrjeu-Gogan, 2002). **Pneumotherapy** "represents all therapeutic, prophylactic, and curative methods that use compressed or thin air in a pneumatic chambers or with the aid of special equipment in which it is alternatively inhaled in hyperpressure, and exhaled in hypopressure" (Ieţcu, 1987, p. 167).

As a vital factor, **water** (as internal regulator) is involved in a decisive manner in the process of aging prophylaxis, as well as in the process of psychological development and optimization. Water is the primary constituent of the body. Throughout life, the balance of the corporal fluid is physiologically regulated through behavioral actions as well. (Kenefick, Cheuvront, Leon & O'Brien, 2012, p. 71). Hydration holds a significant importance for health. „A decrease in body water from normal levels (often referred to as dehydration or hypohydration) provokes changes in cardiovascular, thermoregulatory, metabolic, and central nervous function that become increasingly greater as dehydration worsens" (Murray, 2007). Especially in particular situations, (for example, in the case of persons that practice intense physical activities, that imply thermal stress, or being carried out at high altitudes, as well as in various illness situations: fever, gastrointestinal losses etc.) **professional hydration** is necessary as "across the life span, homeostasis of body water can be difficult to maintain when challenged by strenuous physical work, heat stress, or illness" (Kenefick, Cheuvront, Leon, & O'Brien, 2012, p. 71).

Furthermore, mineral waters can be used as an internal regulating factor (integrated in balneary treatment, for example, in order to amplify effects). **Crenotherapy** (therapy with mineral waters) is based on the curative effects of mineral waters, due to their mineral content. **Sea** water, treated and filtered, boiled, and disinfected, diluted with mineral water or regular water is useful in treating certain conditions as well.

Diet has a significant role in optimizing behaviour. The scientific organization of diet can represent an important physical and psychological

optimization factor and must be mandatorily carried out with the guidance of a specialist.

This way, an informational and energetic intake can be achieved at the level of the system, which profoundly influences the growth and regeneration of the organism, its energetic level and dynamics, its physical and psychological health and balance.

A boost of energy can be obtained through food consumption as well (if chewing is done appropriately). In a desire to optimize behaviour and obtain a general good health condition and "wellness" state, a series of diets have been underlined in time, of which we mention the following: vegetarian diet - only vegetable products, lacto-vegetarian, that also accepts dairy products and eggs aside from vegetables; macrobiotic - a diet in Japan that uses traditional foods, wholegrain cereals, vegetables, fruits and soy products; fasting; "live food" diet, only with foodstuff that have not been thermally processed etc.

Dietotherapy "or therapy through diet is that form of therapy which uses foodstuffs, either in their natural state or processed through special means, as remedies against various pathological conditions" (Jurj & Popescu, 1987, p. 194).

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS - IN SHORT -

Do breathing exercises daily!

Call upon specialists in order to practice various natural therapeutic procedures that use breathing.

Choose to exercise in spaces with the lowest pollution level possible (for example, in parks, or green areas outside the city). Avoid toxic factors, as well as polluted areas! In case of air pollution level increase, avoid carrying out physical activities in the city, especially during the periods of time when solar activity is at its peak (in the middle of the day during summertime, for example). **A solution could be exercising especially exceedingly early in the morning.**

Avoid passive smoking! If you smoke, quit!

The fact that water is becoming more and more polluted is a reality of our time. Therefore, it is recommended that we check the water we consume, and, if possible, purify it.

Avoid industrial beverages as much as possible. Replace them with fruit/vegetable juice, tea, homemade compote;

Consult specialists in order to use various types of water to treat different diseases (natural therapy). Try not to drink alcohol, and if you do, do it in moderate amounts. Quit excessive alcohol consumption!

It is recommended that we drink water in small sips. It is also recommended that we visualize how it brings energy into the entire body.

It is believed that, for the proper function of the body, it is necessary to drink approximatively 2 l - 2 ½ l of water per day. It is recommended that this amount of water be divided throughout the entire day, and that it not be administered in large amounts at a time.

Eating, as any decisive activity in one's life, requires a psychological arrangement.

Respect meal hours.

Consult a nutritionist for a personalized diet!

Module 3
The "Regulation/self-regulation line through intervention at motor and psycho-motor level"

The objectives and tasks of module 3 refer to: learning psycho-somatic relaxation techniques; orientation towards consulting specialists in the field as to exercise systematically; practicing various activities (hobbies) that aim at physical exercise; practicing various activities (hobbies) that require fine motor skills: drawing, playing a musical instrument, crafts, writing etc.

Comments:

Exercising systematically brings vast benefits with regards to sanogenesis, prophylaxis of various somatic and psychological diseases, as well as for their therapy. "Man is first and foremost a biological being, whose structural-functional components (somatic aspect, level of great functions, energy reserves, psychological resources) are generally dependent on systematic exercising." An increased biological potential leads to an optimal health condition, permanently maintained through systematic physical effort" (Bota, 2007, p. 96). Moreover, systematically practiced physical exercises (through their multiple aspects: informational process, transformation and development, adaptation, specialization, regulation process) have a decisive role in reducing harmful effects of stressors and educating immunogenic personality traits. However, before beginning systematic exercising, **a movement aptitude medical exam is necessary** (which implies an initial complex assessment aiming at diet, aerobic effort capacity, motor skills, and psychomotor skills etc.).

An expression of the body's adaptation to the environment, the psychological activity and the motor one cannot, in reality, be separated

from one another (only while operating a strictly theoretical delimitation); for example, elusion of motricity in determinative factors of the psychological construction blocks the explanation of certain fundamental psychological phenomena and mechanisms, such as thought operative structures, according to the theory by J. Piaget (Horghidan, 2001).

Therapies through movement or psycho-somatic relaxation have proved beneficial in both somatic dysfunctions and psychological ones; there are undeniable arguments supporting the idea that, by means of an intervention at psycho-motor level, we achieve energetic balance, an increase in the individual's will to integrate within the natural and social environment, and beneficial effects with regards to both aspects (psychological, and psycho-somatic).

Substantiations:

Due to the extremely important functions that it has (satisfying the need for movement, developing performance capacity, socializing, economic and cultural function), sport, in its largest sense possible (sport for health, for all, free time sport), represents a priority in many countries where the gross domestic product is greatly destined for medical services, aiming at developing and democratizing it.

Physical exercise represents one of the most efficient prophylaxis methods, as well as therapeutic intervention, for a variety of conditions specific to the modern society (for example, sedentary lifestyle or stress), and for aging prophylaxis.

Physical exercises that are systematically performed based on scientific criteria, under the guidance of specialists (both in physical education, and in training, kinetotherapy, or even leisure activities) globally influence the human being: at physical-somatic-biological level, at motor and psychomotor level, and at psychological and social level.

From a physical, somatic point of view, systematic physical exercising has vast beneficial effects, such as: development of muscle capacity, joint capacity, cardiopulmonary capacity, digestive capacity, development of the body's defense function (immunity) etc. "In recent decades, the idea according to which exercising for fitness is in fact "exercising for health" has been accredited, in so far as physical-sports activities constitute a direct, almost exclusive stimulus of morpho-functional development, as a premises for optimal health condition" (Bota, 2007, p. 96). In the case of lack of movement, the body does not react solely through reduced performance capacity, but also through increased sensitivity to sickness, and reduction of compensation possibilities.

Motricity represents "the function that ensures that posture is maintained, and that produces movements in living beings" (Postel & Bonnard, 2006, p. 777). At motor level, systematic physical exercising determines perfecting the motor capacity, and development of motor qualities (speed, force, resistance, suppleness).

Psychomotricity is a function that expresses complex inter-determinative relations between the motor acts and psychological activity. Lafon, 1963, (as cited in Horghidan, Mitrache & Tüdös, 2000, p. 157) defines psychomotricity as being "the result of integrating the interaction of education and the maturing of synergy, and the conjugation of motor and psychological functions, not only with regards to visible movements and expressions, but also with regards to what determines them and accompanies them (will, affection, needs, impulses)".

In essence, psychomotricity manifests as an emergence of the entire psycho-somatic system and is determined by the development of the nervous system, education, and motor-psychological synergy; psychomotor development implies interaction between organizing the motor responses (the body's ability to move) and mental development. The primary components of the psychomotor function are: corporal scheme, laterality, ideomotricity, motor intelligence, coordination, praxis, and is expressed through the global (general) motricity and fine motricity. General (global) motricity represents the corporal movement performed by the body's large muscles (it ensures movement and postures), and fine motricity is defined by the movement performed by the body's small muscles, which can be characterized through great precision and dexterity. Furthermore, systematic practicing of physical exercises has beneficial effects upon psychomotor qualities, such as: coordination, balance, agility, dexterity etc.

Physical exercising guided by scientific criteria has effects on the entire psychological system: as structure generator, the motor act represents the grounds for psycho-somatic development, as physical exercise has a role in both the organization of motor responses and the psychomotor conduct development, as well as "implicitly, a means of acquiring the motor components included in the instrumental pattern necessary of operational constructions at the level of the other behaviour types: cognitive, verbal, self-serve, and socializing" (Horghidan, 2000); in recovery and regeneration, physical exercise is used with the purpose of maintaining formed structures, and to increase relaxation capacity etc.

Systematic exercising has as effect the harmonious development of the body and maintaining an optimal state of functioning of the body; it influences the person's capacity to adapt to and integrate within the social and professional environment. If these exercises are, however, accompanied,

by the person's assimilation of the corresponding philosophy (as in the case of martial arts, for example), the corporal development gains new dimensions, becoming a path to spirituality. The body starts to be "lived", and not just "kept". Practicing corporal activities gains new valences. Through movement, humans "feed" not only the body, but the psyche as well.

Relaxation "is a psychotherapeutic and auto-formative technique, scientifically substantiated, which aims at achieving muscular and nervous relaxation, with a resting effect that is as efficient as possible, saving physical and psychological energy, increasing the body's resistance to stress, and the reduction of negative effects of the stress that has already settled in" (Holdevici & Vasilescu, 1988).

Among the most known relaxation psychotherapeutic techniques, **Schultz's autogenous training** is a self-formative psychotherapeutic method, which produces a "concentrative self-disconnection" (according to the author), which is carried out based on several exercises, grouped in 2 cycles: Basal cycle - through which the relaxation state is obtained - comprises: The silence exercise (obtaining a state of calm and inner peace); the weight exercise (obtaining a state of calm, tranquility, weight); heat exercise (obtaining a state of calm, tranquility, weight, and heat); cardiac exercise (calming heart beats); respiratory exercise (calm and profound respiration); the solar plexus exercise (obtaining a sensation of heat at the level of the solar plexus); forehead coldness exercise (obtaining a sensation of coldness at the level of the forehead).

The guidance of a specialist is mandatory for the superior cycle of exercises (and it comprises the following exercises: concentrating on one's favorite color, on colors imposed by the therapist, on concrete objects and abstract ideas; living "one's own feeling"; interrogation of one's own subconscious).

Progressive analytical relaxation (Jacobson) is based on alternating contraction with the relaxation of the primary groups of muscles. This technique starts from the physiological musculature, and implies a series of successive stages, moving from one muscle group to the next, aiming at obtaining and becoming aware of the state of relaxation, starting from obtaining a state of contraction, and then becoming aware of the difference between the state of tension and that of relaxation.

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS
- IN SHORT -

Consult kinetotherapy specialists for the elaboration and application of a personalized program!

Walk at least 10000 steps per day!

Exercise systematically.

Request a personal trainer for systematical physical exercises!

Use your hands in various activities, such as: practice handwriting, calligraphy; practice playing a musical instrument, practice crafts (knitting, embroidery etc.).

What gets built during the training (and, in general, during demanding periods of time, not just of a physical nature, but also psychological) can be subsequently "torn down" if the recovery / regeneration stage is neglected. As often as necessary and whenever you have the adequate conditions, practice psycho-somatic relaxation techniques (for example, in the evening, before going to sleep, in order to amplify recovery during sleep).

Module 4

The "Regulation/self-regulation line through intervention at sensory level"

The objectives and targets of module 4 refer to: the hygiene of analyzers; protecting and reconstructing the analyzers, prevention of sensory fatigue; use of information that comes from sensory organs for prophylactic, therapeutic purposes, or for the physical and psychological optimization, and for performance capacity optimization; orientation towards positive, pleasant contents of perception; orientation towards consulting specialists in the field with the purpose of undergoing various therapies, such as: chromotherapy, aromatherapy, art-therapy, music therapy and nature sounds therapy, massage etc.

Comments:

Sanogenesis, as well as the development of the performance capacity, can be simulated through the sensory-perceptive control.

At sensory-perceptive level, the Human Psychological System performs reflection when the stimulus acts upon the analyzers ("here and now").

A psychological intervention method at sensory level is that performed through perceptive and perceptive-motor learning.

Perceptive learning has as effect the systematic modification of adaptive perceptive reactions, and formation of perceptive experience. The methods of obtaining the information illustrate the entire evolution of the cognitive system and are profoundly influenced by the stage of thought evolution. Organizing perceptive learning presumes two aspects: an

informational aspect, which refers to the restructuring of the stimulating field in such a way as to facilitate anticipation and generalization; an operational aspect which aims at elaborating certain efficient sensory information extraction and processing procedures. As such, Eleanor Gibson emphasizes three stages of perceptive learning: discovering distinctive properties (attributes); construction of a concrete image from these attributes; formation of an abstract image.

The perceptive-motor or sensory-motor learning consists of modifying behaviour as an adjustment or adaptation to an effective response to the new perceptive conditions, and which imply either the formation of new sensory-motor coordination, or increasing the precision or finesse of the coordination of the preexisting answer" (Epuran, 1994, p. 118).

Substantiations

Negative information (generating negative emotional experiences) are very generously offered by the social environment (for example, by mass-media). Effort and education is needed for the orientation towards positive connotation stimuli. However, the body needs positive experiences for its health.

The stimuli's effect upon the human body may also be emphasized by the existing research in the scientific literature on water, it being the primary constituent of the human body. "We begin to exist as 99% water, as fetuses. When we are born, we are 90% water, and when we become adults, we are 70% water. (...) In other words, throughout our life, we exist as water" (Emoto, 2006). Emoto succeeded in photographing the molecular structure of water in different situations, it being exposed to different stimuli in the external environment (frequently seen stimuli and with which the human body often comes into contact in everyday life). The performed impregnations were subsequently photographed, as a result of the water's rapid freezing, ascertaining the fact that those that produce positive emotions generate beautiful crystals, and those that produce negative emotions generate anesthetic crystals.

Chromotherapy, aromatherapy, art-therapy, music therapy and nature sounds therapy etc. are holistic therapies, the specialized literature mentioning a general physiological effect on the processes that take place within the body, as well as a psychological effect (psychological resonance).

From ancient times, by means of an alternative, holistic therapy form: **chromotherapy**, colors are used in an attempt to heal or improve certain disease, or for the optimization of the general state. Very interesting studies, with vast practical applications, have been carried out with regards to the manner in which color perception influences the body in general, and

the psyche in particular. Knowing the influence that colors have on the human psyche allows the use of colors with a prophylactic and therapeutic purpose (in this respect, there has even been talk of a "**hunger for a certain color**" felt by the patient's body), and in the field of performance capacity development. Color may be used specially to induce a general state of psychological comfort and relaxation, to fight against stress, negative psychological tensions (irritability, anxiety, seasonal depression) etc. The "taking" of the color is used by using different techniques, such as, for example, "color bathing" or "light bathing" (exposure to artificial light that compensates the deficit of solar light - method that has been successfully experimented with at global level). As such, a chromatic environment with predominantly relaxing, balanced, calming colors, such as green and blue, is recommended in the case of active persons that have an impulsive temperament, characterized by a large energy consumption and uneven activity rhythms, that have a restless active disposition. In contrast, nuances that are predominantly towards red and orange, thus colors that favor the need for communication, externalizing feelings, and which inspire optimism and joy, are recommended for introverted, withdrawn, and less sociable persons.

Aromatherapy is a form of complementary medicine (a branch of treatment inspired by natural therapies, more precisely, a phytotherapeutic branch) that uses essential oils from plants with the purpose of improving the body's overall state. It is believed that the cosmic information of a plant with a pleasant smell is concentrated within its volatile substances, **essential oils** (essences, aroma). It appears that their main task is communication (within their own system or with other systems). In aromatherapy, these volatile oils are used for: the olfactory system, skin contact, or internally. The action techniques used are: emanation of odors, room perfume, inhalations, dressings, skin massage, perfumed baths, ingestion of oily ethereal essences (Crăciun & Năstase, 1997).

Therapy through sounds starts from their beneficial, healing effect. Sound is a movement, a vibration, and, in consequence, a form of kinetic energy. "Scientific studies have confirmed the idea that resonance is the basis of healing through sound and music" (Dewhurt-Maddock, 1993). Sound has the capacity of propagating itself as a wave, passing through various environments (air, water, metal, wood etc.). If the sounds are powerful enough, objects can be seen vibrating. "When the sound waves enter the body, vibrations take place at the level of the live cells, as an act of sympathy, which help with the recovery and consolidation of a healthy form of organization. The high content of water in the body's tissues favors the conductivity of sound, and the general effect is similar to a deep message, at anatomic and molecular level" (Dewhurt-Maddock, 1993).

Therapy through nature sounds, correlated with the actions of other natural treatment factors such as the sea, the mountains, the forests, is very efficient in the case of hyperactive emotional states (frustration, anger), as well as in fighting against stress and states in which one is over-tense, or psychological fatigue and exhaustion.

Although music-therapy (**therapy through music**) has recently come to the attention of scientific research, music has been used from ancient times, not only due to its healing effects on the psyche, and, implicitly, its healing effects on the entire body, but also as a way of accessing the forces of the Universe. "In Ancient Egypt, the hieroglyphs corresponding to music was often used for joy and well-being, as well. The Vedic Sanskrit language scholars in Ancient India, as well as the philosophers in the school of Pythagoras in Ancient Greece, viewed all physical forms as manifestations of music... the relatively existent proportions between musical sounds are analogous to the physical proportions of natural and architectonic forms. These old doctrines claimed that life and health depend on an uninterrupted string of harmonious proportions and relations that derive from the spirit, pass through the body, to society and the outside world. The same proportions and harmonies are manifested through sound and music" (Dewhurt-Maddock, 1993). The mantras, incantations, knowledge of sounds, rhythms, and psalms have always been part of the healers' force.

Currently, modern science could assess the effects of music on the body, underlining echoes at physiological and psycho-somatic level (relaxation of muscle tone, lowering heart rate and blood pressure, regulation of breathing, increase in pain tolerance etc.), as well as at psychological level (stimulation of the imagination, attention, memory, perception education, emotional balance, psychological relief, relaxation) (Iamandescu, 2002).

Music therapy can be done actively, by playing a musical instrument or through vocal therapy (which uses vocal sounds), or passively, by listening to music.

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS - IN SHORT -

Hygiene, protection, and recovery of analyzers is extremely important for aging prophylaxis! Prolonged solicitation of analyzers leads to fatigue. Visual or auditive fatigue phenomena are very common at sensory level in daily life. **Consult specialists to find and apply the most efficient solutions.**

Orient yourself towards positive, pleasant perception contents, towards stimuli with tonic and positive affective resonance.

Stimulate perceptive and perceptive-motor learning capacity throughout your entire life.

Use chromotherapy, aromatherapy, art therapy, music therapy, therapy through nature sounds, massage etc. Consult specialists, and schedule them among your daily activities!

Module 5
The "Mental regulation/self-regulation line through intervention at intellectual and spiritual level"

Objectives and tasks of module 5 refer to: educating a rational thought style; cultivating psycho-mental attitudes; orientation towards positive thought contents; developing imagination and creativity; **e**ducating a high level of existence; art **t**herapy; body **s**pirituality; **e**xistence in culture; becoming aware of the creative force of thought.

Comments:

Educating the intellectual and spiritual capacity represents an important prophylaxis and therapy method for psychological, and somatic disorders, and one for psychological recovery and optimization. In modern society, the risk of losing the spiritual dimension, and life becoming no longer sacred can become important factors in the increase of psychological vulnerability to stressful events and harmful environmental factors, and, as such, they can be the cause of physical and psychological disorders. The fight for existence, which becomes more demanding with each passing day, concurrently with the reduction of positive influences that may be exerted by culture and religion, lead more and more to the loss of the spiritual dimension of life.

The higher the education level, the higher life expectancy is. Information, permanent learning, education of a rational way of thought, learning psychological regulation and self-regulation techniques, cultivation of psycho-mental attitudes of orienting towards positive thought contents, are active, positive strategies in aging prophylaxis.

Substantiations:

The concept of intellect encompasses a significantly complex psychological phenomenon, this also being the reason for its many meanings and definitions. Cosmovici (1996) believes that intellect designates a system of relations, activities, and superior psychological

processes (intelligence, thought, memory, imagination, language), a system which constitutes and functions in its entirety at human level, exceeding the sensory experience, yet counting on it, using specific properties of the human brain, and which comes to be and is built only through cultural modeling and social-cultural integration.

The intellectual processes: have a mediated character (signs, symbols etc. can be mentioned as mediators); start from information stored and processed at sensory level, but take place in a mental plane that has a relative autonomy against the sensory one; operate with the results of abstracting and generalization operations (classes, categories), that is why we can say that they have a generic, category character; they operate not only upon what is real, but also upon what is possible; they ensure the reversible and anticipatory character of the psychological time.

The term spirituality refers to "the psychological experiences of religiousness / spirituality in relation to an individual sense of connection to the transcendental" (Greenfield, 2009, as cited in Miron, Sulea & Sârbescu, 2011, p. 51). Numerous studies correlate a person's spiritual level with the state of well-being and physical and mental health (van Dierendock, 2005; van Dierendonck, Garssen & Visser, 2005; Kissman & Maurer, 2002; Koening, 1998). "Many people experience spirituality as an important support aid while trying to cope with a chronic or life-threatening disease (Stefanek et al. 2005). Spiritual orientation has been shown to be associated with mental health (Sawatzky et al. 2005; Koenig et al. 2001), and the association is especially strong among people facing stressful life events, such as a chronic or life-threatening disease (Smith et al. 2003)" (De Jager-Meezenbroek, Garssen, van den Berg, van Dierendonck, Visser, & Schaufeli, 2012).

A human being's entire process of development represents a road towards becoming spiritual. The corporal development represents the basis for this significantly complex process. "Given that man is a microcosmos, a body-soul-spirit unit, the body illnesses affect the soul, spirit, as the illnesses of the soul and spirit deteriorate the body" (Macavei, 2001). That is why, for a greater efficiency, mental regulation techniques are learned after the body has been disciplined and the psycho-somatic relaxation techniques have been assimilated.

There is a very rich specialized literature regarding the metal regulation methods and techniques, starting with techniques described in ancient oriental systems (Hindu systems - Yoga, Zen, Tao techniques etc.) - concentration, meditation, and contemplation techniques; Christian spiritual techniques - prayer, meditation, contemplation; modern psychology

techniques: techniques used to become aware of what is real, positive thinking, imaginative techniques, mental training etc.

Concentration techniques aim at educating and disciplining attention by strengthening will, eliminating chaotic movement of thoughts (among the most known are: the technique of concentration on a point, concentration on breathing (Yoga), Tao techniques: "stop and observe", "observe and imagine", "use your mental reasoning" etc.).

Meditation is defined as "a mental practice that limits the "input" of exterior stimuli by directing attention towards a single stimulus, unchanged or repetitive" (Holdevici, 1993).

In Yoga, the meditation technique aims at: static fixation of the mind in a single place (Dharana). Through this fixation on a physical object or within an image, we obtain the meditation of that object. Dhyana is defined as follows: "the content of the mental effort of assimilating the object of meditation, free of any other effort of assimilating other objects" (Vyasa as cited in Eliade, 1991) Shamadhi is the contemplative state as an effect of mental fixation upon the shape of an unhindered object, without the collaboration of categories or imagination: "The mind becomes one with those infinite nuclei of energy that constitute the true basis of the physical universe. It is a real leap into the true essence of the physical world, and not within the qualified and individual phenomena" (Vyasa as cited in Eliade, 1991).

Patel (1984), as cited in Holdevici (1993), described the following forms of meditation: simple meditation on breathing; meditation on a mantra; experiential meditation; devotional meditation (mystical contemplation, prayer, concentration upon certain religious ideas, practicing ritual song).

Obtaining rest or a state of "non-effort" is linked to "**mental clearing**" (a state of non-action, doubled by the release of prejudices and preconceptions), doubled, eventually, by the perception of one's own corporality, heart rate, and breathing. From Jung's perspective, this mental clearing exercise creates an increased receptiveness and openness towards archetypal possibilities.

Caycedo (1960) imposes **sophrology,** "a doctrine which aims at ensuring consciousness harmony, and which is based on simple relaxation techniques originating in hypnosis, and on dynamic relaxation techniques, inspired from oriental philosophies" (Postel, 2006, p. 1149).

Due to the mental activity they imply, **concentration and meditation techniques** are efficient recovery means, when strain is mainly physical. The motor and verbal actions aim at modifying the external environment, and the carried out action modifies the subject in question as

well. The internal verbal action and the mental action (especially in the form of representations, schemes, or symbols) have a self-regulating internal effect. A new condition is prepared through internal modification, one that foreshadows the regulatory intervention action within the external environment extern (Tüdös & Mitrache, 2011).

The Christian spiritual techniques emphasize the fact that "through fasting, vigil, and prayer, man separates himself from the material world. During the imposed rest, the discipline of calm, of silence, man rediscovers force through prayer and contemplation. Through this asceticism, man defeats the physical, corporal evil, and the evil of the soul" (Macavei, 2001).

The asceticism tradition of the Christian Sunrise describes two methods of fighting against evil thoughts (rediscovered in modern positive thinking techniques): direct method, called by Evagrius Ponticus the "antirrhesis method" (resistance through word) which consists of confronting evil thoughts through will power, and the indirect method, that refers to deviating attention towards positive thoughts, and getting involved in activities that generate satisfaction, and, in general, positive energies (such as prayer and contemplation) (Macavei, 2001).

Among the positive effects mentioned in the specialized literature on mental regulation techniques, we find: obtaining a state of calm and inner tranquility; cultivation and development of attention qualities; development of will and voluntary effort capacity; disciplining thought, elimination of mental disorder; elimination of negative tensions, of states of anxiety, fear, frustration, nervousness, irritability; positive thinking; reduction of psycho-somatic illness symptomatology; regeneration of biological and psychological functions; improvement of self-image, gaining faith in one's own capabilities (Tüdös & Mitrache, 2011). Holdevici (1993), draws attention to the fact that not all subjects benefit from practicing these techniques. For example, meditation is contraindicated in the case of patients with an excessive need of self-control, thus the need to see a specialist.

Intuition and the intuitive resolution ability **are characteristics of those who are mentally trained.** Resolution through intuition characterizes those exceptional individuals who, through their way of life, and previous intense efforts, may: master the technique (over-learned), have support and abstain energy, total orientation towards the task (in which solutions are linked to the relevant sensory information in a short-circuit manner, eliminating information that triggers interference), the capacity of clearing the mind of the effects, respectively, consequences, of the activity that is taking place.

Csikszentmihalyi (1990) imposes the concept of "**optimal experiences**" (**peak experiences**) or "**state of flow**" that implies "the total participation in activity, concentrated attention, expanded perception, intrinsic motivation, pleasure, transcendental self-actualization". The author believe that optimal experience, authentic happiness are lived when a person is in a state of flow, when the body and the mind are engaged in achieving something difficult, that represent the person as a person with clear and challenging purposes, implying an maximum individual effort, and creativity.

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS
- IN SHORT -

Think rationnaly, abandon the way of thinking in terms of: "I need to...", and replace it with: "I would like to... and I am doing all that I can for it, and I accept the fact that it might not happen".

Orient yourself towards positive thought contents.
Exercise the ability to forgive and to be forgiven by others.
Exercise the ability to be grateful.
Constantly train your thinking ability.
Keep a journal.
Do concentration, meditation, and mindfulness exercises.
Do exercises to develop creativity.
Exercise effective coping strategies.
Play games that engage thinking, imagination, creativity.

Module 6
The "Line of regulation/self-regulation through development/optimization of communication capacity"

The objectives and tasks of module 6 refer to: development of intra-systemic communication capacity with one's own body; development of the inter-systemic communication capacity with the natural-cosmic and social-cultural environment; forming capacities and abilities that allow for efficient communication with other people and oneself; forming capacities and abilities that allow for efficient communication in the virtual environment; becoming aware of the spoken or written word.

Comments:

Looking at communication in the broadest sense possible, as any exchange of information, matter, and energy between two systems or

elements within the same system, the psyche is a communicational system and is built in the communicational process.

As a result of the systemic approach of the person, distinction can be made between: inter-systemic communication - individual-external environment (thus, if we refer to the individual-social environment communication, then we are referring to interpersonal communication, psychosocial communication), and intra-systemic, intrapersonal communication - communication with the internal environment, between the different components (sub-systems), communication that takes place within the body, in a person's internal forum.

Communication represents one of the most natural methods of networking (relating), of social adaptation, and of inter-influencing.

The basis of permanent education is represented by the communication skills that create the premises for expanding the individual psychological space, as well as communication in foreign languages, or communication in the virtual environment (information and communication technology: computer network system, telephone systems, audiovisual networks systems).

"The word can contribute to mobilizing a very vast range of mental and psycho-physiological functions. This applies to the spoken, written word, or the word corresponding to the internal language" (Gheorghiu & Ciofu, 1982). The word, as a motor act (verbal-motor, oral and/or written) specialized in circulating information, has an exceptional role in regulating behaviour. Verbal communication is the "rotor" of psychological life, the word being the one that intermediates the continuous regulation - self-regulation, conscious - unconscious, voluntary - involuntary, constructive - destructive processes.

"The word is the power that we have of expressing ourselves and communicating, of thinking and creating the events in our life. The word is man's most powerful tool. The word represents the manifestation of our spiritual being, the divine spark within us. Words can create the most beautiful dream and reality, but they can also destroy everything around us" (Dumitru-Constatin, 2019, p. 2).

Therefore, each spoken or written word is an event which, once unfolded, has repercussions both on the external environment and the internal one (at body level). The responsibility of communication is incredibly significant. A word "that slipped out", "was spoken at random" or "when angry" may have consequences that are unpredictable, or which cannot be calculated from afar. The word is a universal regulator, that is an operative factor, both in the demand stage, and the recovery stage. "Man staggeringly depends on the actions of words written or spoken, direct or

subtle, either literal or poetic, authoritarian or lax, persuasive or common... In confusing, crisis situations, we can assess, for example, the efficiency - positive or negative – of a single word" (Gheorghiu & Ciofu, 1982).

While communicating, a mirror image is given of the expression methods, "the expression", content of experiences, attitudes, subjects' opinions, level of intellect and level of language diversification, knowledge, conception, style of thought, level of observations, level of worldly and life experiences, of certain psycho-affective experiences, of certain personality traits, as well as of psychological activities, communication capacity, temperament characteristics, trust, spontaneity, emotional balance, and coherence of thought and psychological activities, verbal abilities etc.

Even in the case in which the word is used by a person in order to dissimulate and hide their thoughts, emphasis can be made of the fields within which one feels the need to hide, as well as the tendency of conscious or unconscious simulation (Horghidan, 1997).

Substantiations

Communication, approached in the broadest possible sense, represents any exchange of matter, information, and/or energy between two or more systems, or within the same system between two or more sub-systems. "A certain type of communication with the ambiance corresponds to each form of movement of organization of matter" (Golu, 1997, p. 165). As such, in order to adapt, every system communicates with the environment to which it must adapt. Communication implies the existence of connections, links between the elements (systems) that communicate. Subsequent to communication, "the reflection of the transmitting system (reflected) is ensured within the receiving system (reflecting)" (Epuran, 1994, p. 244).

Looking at things in the broadest possible sense, the psyche is a communication system, and it is built (Golu, 1975) in the communication process. The genesis of the human Psychological system implies a "double communication": on the one hand, "the great communication" of the individual with the external environment, through which the **subjective informational model of objective reality** takes place, and, on the other hand, the "minor communication" within the system, which has as product **the self's own informational model**.

From a psychosocial point of view, communication implies inter-human networking, interaction, as well as inter-influencing (power). Shannon and Weaver (1975) believes it to be the ensemble of the procedures through which a spirit may influence another spirit. Communication, from a psychosocial standpoint, represents the relationship through which the

interlocutors may understand and influence each other by means of the continuous exchange of information, encrypted in various ways.

Therefore, inter-human communication implies the interaction between two or several persons, which has as effect the inter-influencing of attitudes.

Individual communication is based on transmitting the subjective psychological content through words (transforming thoughts into words so that they may be transmitted). The communication sub-system, the language offers the possibility of sending a message to other systems, messages that encrypt their own internal undertakings, their own thoughts. "Communication is, thus, a verbal, oral, or written activity. Entire strings of words travel from one spirit to another... Similar to small capsules, words open up in order to release information. Gathering these words and phrases, the receiver obtains the precise reproduction of the transmitter's thoughts" (Winkin, 2001).

Individual communication has intentionality, is rational and voluntary, and can be subjected to assessment. Therefore, we can say that it is normal or pathological, effective or ineffective, correct or incorrect etc.

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS
- IN SHORT -

Educate your assertive style of communication!
Learn foreign languages!
Develop your virtual environment communication skills!
Orient yourself towards positive communication contents!
Be aware of the information that your body is sending you!
Turn to animal therapy!

Module 7
The "Line of regulation/self-regulation through development of social integration capacity"

The objectives and tasks of module 7 refer to: becoming aware of and developing social resources; building certain functional social networks (for example, the network of friends, and the network of specialists); increasing the capacity of adapting to the social environment through self-regulating conduct.

Comments:

The integrative, holistic approach of a person implies studying somatic, psychological, and spiritual aspects, as well as psychosocial aspects generated by that person's integration within the social environment.

Social resources, social support, and especially the manner in which the individual perceives the quality of the social support, the level and quality of a person's social integration, represent important protection factors for that individual against harmful effects of stress, and for aging prophylaxis.

As an individual can be approached in a systemic manner, the groups is also a hypercomplex cybernetic system, with all its attributes.

Substantiations

The group represents "a multitude of individuals, which can be either big or small, may admit borders more or less precise, stable, or permeable, may be more or less structured, and which is characterized by a degree of affective cohesion and unity of conducts, attitudes, and beliefs" (Depret, 2006, p. 519). The group's social identity represents the ensemble of circumstances that make a group what it is.

The small group is made up of a limited number of members and is characterized through the fact that: the members carry out at least one common activity, have common purposes and objectives, and direct interpersonal relationships; there is a system of informal laws (mutual conventions) and/or formal-encrypted ones with the purpose of efficient cooperation. Spatial proximity is also a condition for the existence of a small group. At the level of each person's ontogenesis, the small group has significantly important functions: social learning function, security function, social integration, and self-regulation function at the level of each of its members.

Broadly, social learning represents any psycho-behavioral amendment that determines a more efficient, superior adaptation to the social-cultural environment. The content of social learning is, in a vast sense, the social-cultural experience that determines the development of the human psychological system, and of the personality. Mureşan believes that social learning represents a process through which cognitive, affective, moral, and social individual and collective behaviours are assimilated, elaborated, and developed. Social learning offers a person the possibility of taking over certain attitudinal-behavioral models that bear the mark of the culture, norms, and values that have been validated in time, and that have proved to be efficient.

A fundamental element of the construction of the cultural identity is represented by the process of each individual internalizing cultural values that are common to the cultural group to which one belongs, thus becoming a person, a cultural actor. Henri Ey insists upon this process of selective internalizing of cultural group values, indicating that this is the manner in

which a mental capital representing the Self's value system is constituted throughout a person's axiological trajectory.

The **security function** is extremely important for a person's psychological balance; in the case of subjects which are in their development stages, it represents the basis for the harmonious development of their personality, and in the case of adults and the elderly, it represents the basis for the "psychological comfort" and the quality of life. For example, confidence or lack of it, self-assurance or insecurity, anxiety occur as a result of the attachment quality (of the style of attachment developed), as an expression of the specific of the social relationships that the individual was involved in. The psychological state of security, safety is a fundamental need of man, and a fundamental condition for one's mental balance and health.

The **social integration function** answers the individual's real needs, the general-human needs, such as, for example, those of association, belonging, affirmation, recognition, social status. The organization and integration of information within hierarchical structures represent the grounds for adaptation to the environment, and for the person's development. Belonging to a group and integration offer the possibility of permanent comparison between self-image and the image of the group with regards to that respective person; to be more precise, each individual has the possibility of receiving the necessary information from the other members of the group.

Any group implies a series of attributes, such as: structure, interaction, cohesion, social identity, purposes etc. As such, the group is characterized through the configuration of an informal structure, based on certain criteria - for example: the network of statuses and roles in interaction, the system of psychosocial relationships etc.

The group psychological activity represents "the transformations carried out by the members of the groups in order to constitute a group (imaginary identifications, repression, production of common symptoms and signifiers, contribution to the common ideal), as to become detached from unconscious alliances, and to accede to an individuating subjectivity" (Kaes, 2007, p. 26).

Group performance represents those attributions that are estimated to be fulfilled by the respective group (by means of the interaction of group members). A means of optimization of the group performance is constituted by the analysis of effects that the presence of other groups members has on the individual performance: effects of social facilitation or inhibition, the effect of "social laziness", the group's influence on attitude and decision making, polarization, group thinking (identification of their manifestation at

the level of the group, and intervention with the purpose of increasing the activity's efficiency).

The **purpose of the group** or what it sets out to do, the finality of its actions, reflects the orientation assumed as a group. In certain cases, the constitution of a group is justified through achieving certain objectives and of the purpose (for example, the performance purpose and objectives). The purpose represents "the ideal anticipatory image of certain performances, achievements etc. as possible systems of anticipative satisfaction of action needs" (Mureșan, 1990, p. 25).

The **group effect refers to the ensemble of** "morphological, physiological, and/or ethological modifications manifested by an individual as a result of sensory stimulations received from its congeners" (Suzzoni, 2006, p. 523).

Interpersonal relationships imply communication. The person is constantly influenced by the behaviour of other people and seeks to be in the company of others. "He is not a simply spectator of the activity, but is inside the group where there is a certain position, carries out certain instructions, receives and issues messages, is accepted and sympathized, or marginalised or rejected. He will perceive how others see him from a lot of índices which he can identify and interpret, he adjust his own image and his own behaviour, will also change psychologically" (Neculau, Chelcea & Mitrofan, 2004). Social influence represents the process of "predetermination and modification (spontaneous or guided) of behaviours, attitudes, beliefs, values etc. pertaining to persons and social groups by other persons or social groups, organizations, institutions etc. in accordance with social requirements" (Mureşan, 1990: 20). The simple presence of another person influences our behaviour (**social facilitation phenomenon**). The interpersonal relationships are established between persons and are guided by the necessity of satisfying human needs. These are inter-knowledge, affective-sympathetic, professional relationships etc.; an adjustment is made to the other's behaviour by means of interpersonal relationships.

The affective-sympathetic interpersonal relationships refer to the interpersonal preferences or rejections through which the informal organization of the group and the psychosocial field is created. "In any group situation, an implicit imaginary representation is common to many participants: there is no group without the imaginary" (Kaes, 2007, p. 385).

Cohesion refers to joining the elements of an ensemble (system) into a unitary whole, leaving a mark on the members' level of satisfaction, and on the performance of said group. A higher degree of cohesion means trust among the group's members, and an efficient communication.

RECOMMENDATIONS / PSYCHOLOGICAL SOLUTIONS
- IN SHORT -

Talk to your friends daily, do not limit yourself to the family environment, build and maintain social networks!

Build a social network in which you will be active even after retiring.

Seek to practice activities that develop your life experience (activity which can be carried out at older ages);

Communicate with your friends both when positive events happen in your life, as well as when negative ones appear.

No negative event should be lived in solitude!

Build support networks (a network of specialists in various fields, a network of friends, a network of colleagues etc.), practice how to access them.

Discussions

Age prophylaxis and a person's quality of life are determined by the need to adapt to the environment (conditioned by informational-energetic communication), and by the constant personal development and spirituality efforts, those for strengthening informational and energetic-dynamic resources, and of directing psychological activism.

The general model elaborated by this study is presented as an action system, with internal links, multi-leveled inter-systemic connections, so that intervention at any level will have global consequences (by reason of the principle of intra-systemic functional solidarity, according to which any modification, at any level, shall echo at all other levels depending on the subjective impact of said modification).

This model begins from educating a person's axiological system, and by unconditionally accepting oneself; each person is valuable through its own existence.

The model promotes a holistic, systematic, and integrative approach of the individual, who is viewed from a somatic, psychological, spiritual, and social standpoint.

The person's adaptation to the natural-cosmic and social-cultural environments also includes the aspects of relationship integration (exo and endocorporal), self-regulation/regulation capacity, learning capacity.

The psychological intervention is done in an operational manner, while keeping in mind the **finite**, yet perfectible, character of substantial-energetic resources, concurrent with the **infinite** theoretical character of informational development.

The possibilities of optimizing the adaptive behaviours are initially determined by the system's genetic informational structure which condenses the essential environmental factors as potential communication systems.

As a consequence of exponential progressive development, the mental and spiritual level offers unlimited possibilities of optimizing, developing, and perfecting the individual bio-psychological system. This is done through the efficiency of intra-systemic regulation - self-regulation (between the component sub-systems), as well as of inter-systemic ones, in connection with other systems, from social-cultural and environmental level, to the transcendental levels.

The development and perfecting processes imply becoming aware of, developing, and selecting the most efficient inter-communication - interaction relationships within the intra and inter-systemic multi-leveled hierarchic links.

The aim is to educate a system of sanogenic behaviours that will be assimilated and applied simultaneously, and that will amplify its beneficial effects upon the person.

This general model is personalized depending on the case.

Conceiving a personalized intervention program must begin from studying the coordinates that define the action system: Psyche (the internal psychological structure of a person or a group) (P): The action system is addressed to a person or a group.

The psychological structure of the subject (the cognitive, motivational, affective, volition, psycho-motor, personality, inter-relations sub-systems etc.), regarded as a result of one's personal history etc.

Or, the group structure, if applicable (the group structure, purpose, social identity, group effect, communication, inter-personal relationships, group psychological activity, climate, group emergence, group performance) etc..

Objectives (O) - the finalities of the intervention;

Total external environment (physical, technical, and social) (M) - the environment in which the intervention takes place (the total ensemble of elements with which the subject interacts during therapy, and the relationships between them); **interdisciplinary team (physician, kinetotherapist, nutritionist, personal trainer, alternative therapy specialists etc.);**

Time (T) - dynamics, organization based on temporal sequences, stages etc.

The psychotherapist's psychological structure (SPT)

The adopted **Strategy (S) -** this implies: The Intervention Content (C) - logically structured by areas of content (A.C.); Psychotherapeutic means; Intervention methods

Conclusions

From the point of view of the theory of systems, the person is a hypercomplex bio-psycho-social-cultural system, characterized through: dynamic spatial-temporal development, existence of substantial, energetic, and informational links between the elements of the system (as well as between them and the environment), existence of structure and hierarchical organization. The development, formation of structures, and organization of a system are adaptive answers as a result of communication and environmental integration efforts, and, subsequent to this communication, the system builds or perfects/reconfigures its own architecture.

In order to survive, the human body makes a permanent exchange of information and energy with the external environment. In order to maintain one's well-being and health, the quality of this communication is particularly important.

A person's quality of life and health condition as an individual gets older is the result of an entire personal history, and it reflects the quality of a hypercomplex adaptive process to the environment, the manner in which resources are managed, and how opportunities and chances are valued throughout life. We all make constant efforts of personal development and of optimizing performance capacity in order to face the aging phenomenon.

Optimization of an individual's performance capacity implies enhancing an individual's bio-psycho-social capacity, his potential (it refers to those scientific undertakings specific to that respective case: elaboration of solutions for the individual's specific problems, and selection of an optimal solution that determines the maximization of that person's performance).

The risk factors do not normally act in an isolated manner on the body, but in a greater number, in a system, and the harmful effect becomes more significant within an unhealthy lifestyle that a person promotes (by adopting such a lifestyle, not only does a person no longer avoid these factors with a rick of illness, but, most often, she also promotes them).

The lifestyle organized on scientific criteria creates the premises for the physical, psychological, and spiritual well-being of a person, for the development and maintenance of the ability to lead a productive life from a social and economic standpoint, and it is based on permanent learning and education and on the constant efforts a person makes for personal development.

The complexity of the issue of aging prophylaxis implies an inter and trans-disciplinary methodology, allowing to surpass discipline boundaries, towards an integrative, functional-dynamic, and holistic approach of the human being, which makes it possible to emphasize new methods of viewing and understanding a person and the human activity, as well as new methods of psychological, educational, therapeutic intervention etc.

The general model of "System of regulation lines" is made up of 7 modules, each one being destined for a "regulation line", classified under an action system proceeding from the integration within the natural-cosmic environment, to the integration within the social-cultural environment (educational, professional, etc.). Through them, the aim is to intervene at somatic level, as well as as motor and psycho-motor, sensory, logical, intellectual, spiritual, psychosocial levels etc., with the purpose of educating a system of sanogenetic behaviours that will amplify their beneficial effects on the individual.

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Chapter 4

The influence of stereotypes and prejudices on mental health among the elderly

Denisa BERCEANU[1]

Abstract

The aim of this research is to provide a scientific approach on ageism in Romania, as well as other concepts from Gerontology, such as mental health in older age (looking primarily at anxiety and depression). The aspect of major interest for the present study is the psychological well-being as a factor that can improve the negative mental health of the elderly while experiencing ageism.
The research was conducted on a sample of 84 participants, aged 60-78 years, from Romania. The questionnaires assessed discrimination and attitudes towards older age, as well as depressive and anxiety symptoms and well-being.
The results showed that stereotypes have strong negative consequences on the mental health of older people, being a factor that should be taken into account in the process of developing future strategies to support this age segment.

Keywords: Ageism, old age, senior, discrimination, depression, anxiety, mental health, wellbeing.

Ageism ("Age discrimination") - negative attitudes, stereotypes and age discrimination. The strongest effect is felt among the elderly and it could be manifested implicitly and subconsciously. For this reason, unlike other forms of discrimination, ageism is the only one that is socially accepted.

Old age - a period close to the end of life that is often associated with retirement. Most of the time it comes with a very large number of diseases and health problems, as well as with the degradation of cells.

Senior - a person who went through the experience of the first stages of life, characterized as having gray hair, old age and who is retired. Seniors may be more vulnerable in terms of physical health due to biological changes, but they may have a higher level of maturity and wisdom.

[1] Doctoral School – Psychology, Faculty of Psychology and Educational Sciences, University of Bucharest
Correspondence address: Denisa Berceanu, Faculty of Psychology and Educational Sciences, University of Bucharest, Panduri Street, no. 90, Bucharest, Romania, Postal Code 050657; Phone: + 40-752-919-054; E-mail: denisa.berceanu@gmail.com

Discrimination - an action characterized by an unfair attitude, aiming to exclude certain people because of their membership in a certain social group. The most common forms of discrimination are based on rejection due to characteristics such as age, gender, ethnicity or sexual orientation with a major impact on the concerned persons.

Depression - a disorder characterized by sadness, which can persist for a long time, preventing the normal conduct of daily activities. Among the elderly, it is sometimes erroneously considered a normal state of the aging process. In reality, depression can adversely affect physical health, increasing the risk of death among older people.

Anxiety - an emotion characterized by nervousness, excessive worries and the perception of critical situations as threatening. Older people are more prone to situations that can trigger anxiety by realizing the loss of independence due to falls or deteriorating health (requiring long-term care), or loneliness manifested by the loss of a partner.

Mental health - a state of health that allows the normal and productive functioning of the person in society through favorable adaptation to emotional, behavioral or social level. Mental health can be influenced either by biological / genetic factors and a history of family health problems or by life experiences / traumas.

Wellbeing - Subjective psychological well-being that a person can experience. It involves a high level of quality and satisfaction of life, as well as constructive emotional experiences with others, generating positive emotions and leading to self-fulfillment and increased self-confidence.

Introduction

Demographic aging and its challenges are important issues, especially due to the fact that in Europe in general and in Romania in particular, the elderly population is a growing segment (National Council of the Elderly, 2017). However, we live in a society that glorifies youth and rejects elders, being deeply affected, as we age, by the appearance of wrinkles or signs of old age. In this regard, anti-aging products have been increasingly promoted, with statistics estimating their sales at a value of $80 billion / year mainly due to their increased use among the Baby Boomers generation (Chonody & Teater, 2017).

Other statistics show an increase of 7.5% in the capital of the anti-aging cosmetics industry that is expected in 2016-2021, with an estimated sales value at the end of this period of approximately $ 216.52 billion, compared to 2015 when the sale of cosmetics has reached 140.3 billion (Zion Market Research, 2018), as well as the promise that they will reduce the physical effects of aging (Palmore, 2015). However, one thing is clear: there will be many older people than ever before in human history and we are only at the beginning of this trend (Gendron, Welleford, Inker & White, 2016). Moreover, the World Health Organization predicted that between 2000 and 2050 the population over the age of 60 will triple from 600 million to 2 billion (Shiovitz-Ezra, 2018).

However, the concerns of scientists and business people about age go beyond physical appearance. The threat of disease, disabilities, cognitive impairment, loss of independence, death, are aspects that are closely related to the aging process. Both scientists and the pharmaceutical industry have worked hard to find solutions to stop this process. However, dissatisfaction in this area is not only related to the aging process, but also to ambivalent attitudes towards the elderly. The changes that society has undergone over the last decades have considered the elderly, firstly marginalized and institutionalized, and secondly, irresponsible and powerless (Nelson, 2005).

Thus, this phenomenon, called by the scientific world ageism, is one of the major concerns that influence society more than in previous years (Palmore, 1999). It refers to situations in which people perceive that they have been unfairly treated because of their age (Minichiello, Browne & Kendig, 2000). Negative attitudes, stereotypes, and prejudices about older people are on the rise (Gendron, Welleford, Inker & White, 2016), but they are often subtle or easily overlooked.

Robert Butler (1969) is the first author that defined this concept. According to him, from a conceptual point of view, ageism could be manifested in at least three forms: negative attitudes towards the elderly, old age and the aging process; discrimination or unfair treatment of the elderly; and the implementation of policies and practices that reinforce negative stereotypes about the elderly, reduce opportunities for a fulfilling life and undermine personal dignity (Butler, 1980).

The current study used the term ageism developed by Palmore (1999) according to which ageism refers, on the one hand, to age-related prejudices (which include stereotypes and attitudes) and, on the other hand, to discrimination against the elderly (including personal acts and institutional policies). Although the author considers that there are both positive and negative forms of this concept, however, the tool developed by the author based on this theory (used in current research as well) includes only negative forms of ageism (Palmore, 2001).

Ageism is a widespread phenomenon in the world. Unlike other forms of discrimination, such as sexism and racism, ageism is the only socially accepted form (Officer & de la Fuente-Núñez, 2018). However, there are a a lot of people remaining ignorant when it comes to its impact on the people concerned. Thus, regarding the adverse effects of discrimination on the lives of older people, these include: limiting employment opportunities (Abrams, Swift & Drury, 2016), diminishing career progression (Bal, Reiss, Rudolph & Baltes, 2011), as well as making false decisions by both health and mental health care staff (Robb, Chen & Haley, 2002).

Over time, a number of qualitative and quantitative studies on the impact of ageism on the lives of older people have been conducted (e.g., how they are treated or the poor services provided to them) (Minichiello, Browne & Kendig, 2000; Ripponet et al., 2014). Other authors have focused on studies that consider subjective age and how it can be changed due to the influence of stereotypes (Hess & Dikken, 2010), but also on the image of the elderly on physical appearance (Oberg & Tornstam, 2003; Ward & Holland). At the same time, in recent years, a considerable number of studies emphasized that perceived discrimination could have negative consequences on well-being and life expectancy (Avidor et al, 2017), while positive attitudes could be associated with higher levels of life satisfaction, positive self-reported mental and physical health, and lower levels of anxiety and depression (Bryant & Koder, 2015).

However, not only the experience of ageism could have major repercussions in people's lives, but also the experience of other forms of discrimination such as racism, sexism or discrimination based on sexual identity, in some cases. In this regard, a longitudinal study showed that experiencing any form of discrimination could predict mental health problems in older age (Luo et al., 2012). Other studies highlighted a strong relationship between discrimination, stress and mental health (Schmitt, Branscombe, Postmes & Garcia, 2014). These results are closely related to Minority Stress Theory (Minority Stress Theory; Meyer, 2003) which refers to the fact that belonging to a certain group or stigmatized population could lead to the experience of discrimination and prejudice, which will further lead to stress, as well as potential mental changes, especially on depression and anxiety. There are more articles that have provided evidence in favor of this theory, especially among ethnic and sexual minorities (Pascoe & Smart, 2009).

Regarding age discrimination, more authors have focused on the study of depression among the elderly (Cuijpers, Smit & Andersson, 2009), concluding that experiencing marginalization due to old age has been associated to some extent with higher depressive symptoms in old age, as well as with other mental health problems. An example is the United States National Longitudinal Health and Wellbeing Study (MIDUS), which showed that the perception of age discrimination was associated with depressive and anxiety symptoms among the elderly in the United States (Yuan, 2007). Moreover, a relatively recent longitudinal analysis involving data from the US Health and Retirement Survey showed that changes in perceived age-related discrimination predicted changes in depressive symptoms over a 4-year period. Thus, if the elderly considers themselves less discriminated in different situations at the older age, they will present a

significant reduction in depressive symptoms on a long-term (Han & Richardson, 2015).

Although the number of studies assessing the influence of mental health stereotypes has been on the rise in recent years, few is known about how the relationship between ageism and mental health varies across sub-populations or the coping mechanisms that older people have while experiencing stress after exposure to stereotypes (Lyons, 2017). However, there are certain theories that underlie this statement (Sharp, 1997; Ayalon & Gum, 2011; Lyons, 2017).

An example is the Theory of Competence in Crisis Situations, which argues that people who experience discrimination in their youth but in other forms (such as discrimination based on sexual orientation or racial discrimination) may develop a better coping ability that help them cope with ageism in old age (Sharp, 1997). In this regard, previous research in the United States has shown that although older African Americans reported a higher level of discrimination compared to European Americans, however, the latter registered more mental health problems (Ayalon & Gum, 2011). This can be explained by the fact that African Americans have developed coping mechanisms as a result of experiencing lifelong discrimination and thus, has helped them to be less affected by discrimination in old age. Similarly, women (who are confronted with gender stereotypes from an early age) or people with different sexual orientation may develop such coping mechanisms due to their previous exposure to other types of discrimination (Lyons, 2017).

Historical perspectives of ageism

In the pre-modern period (from the beginning of the 15th century to the end of the 18th century), the average life expectancy was significantly lower than now (2000s), so that "old age" was not a real problem (Chonody & Teater, 2017). For example, some studies suggested that the average life expectancy at that time was about 30 years, in all regions of the world (Roser, Ortiz-Ospina & Ritchie, 2013), and less than 50 years even in the richest countries (Prentice, 2006).

However, religion and culture had a significant influence on how old age began to be seen. In religious texts, such as the Bible and the Quran, for example, elders were treated with dignity and respect, held a position of authority, and were considered wise (Chonody & Teater, 2017).

Also, during the period mentioned above, older men enjoyed a high status in the community, while women could enjoy a remarkable position only if they married a man who had a good financial situation and a high social status (Chonody & Teater, 2017). Both survival and the opportunity

to benefit from it have been and still are closely linked to social class, so for those who have money and power, aging is done in a much more positive way due to faster access to resources and better living conditions (Gabriel & Bowling, 2004).

However, until the 15th century, the status of the elderly was much higher compared to the following years. What changed people's attitudes toward the elderly were mainly two major events (Nelson, 2005): Printing Press - introduced around 1440 which had a negative impact on the perception of the elderly status in the community (Nelson, 2011); and Increased literacy among the population in the past, the elderly being considered as the people who had knowledge, compared to the rest of the population (Branco & Williamson, 1982).

Later, the Industrial Revolution (1760-1840) was an important event that lowered the positive perception that people had on the elderly until then. This has contributed to the disintegration of the extended family structure by making older people no longer live with other family members (Chonody & Teater, 2017). The evolution of technology was a turning point for the elderly, who did not have the necessary knowledge to use it and could no longer participate as an active workforce in society, thus leading to a decrease in their economic level (Chonody & Teater, 2017). During this period, the idea that the elderly is a problem for society began to be considered, being the starting point in describing them in negative terms (Nelson, 2005).

Cultural perspectives of ageism

Over time, attitudes toward elderly have changed, shifting from a position of power in the pre-modern period to reaching their social exclusion in the first decades of the 21st century. This favored the appearance of useless, unpleasant and unwanted feelings. In this sense, the aging process itself has begun to be seen from a negative perspective, with the elderly being one of the risk groups (Butler, 2005).

The situation became more complicated when there was a deepening of negative perceptions about the aging process in society, which made it difficult not only to include the elderly in various forms of social life, but which posed a threat from the perspective of solidarity between generations and social integration (Găgăuz et al., 2015).

According to the National Council of the Elderly (2017) the image of old age is different depending on each society and depends not only on the way the old man looks and behaves, but also on the social norms that determine who is and who is not old. Movies, television, literature, jokes, cartoons, birthday cards, and songs tend to describe seniors as senile or descendant (Palmore et al., 2005).

Television and the film industry use all these negative stereotypes, considering that older people are incompetent, physically and sexually unattractive, fragile and sensitive - and all this for audience entertainment (Chonody & Teater, 2017). However, age-related remarks can often be well-intentioned, subtle, or may appear as a compliment (e.g., when an older woman is called a "young lady") (Gendron et al., 2015). Promoting these negative aspects, as well as the fact that the elderly are always the focus of jokes (Zebrowitz & Montepare, 2000), the media promotes this attitude, reinforcing ageism and anxiety related to the aging process (Palmore, 2000).

A recent large-scale linguistic analysis found that age-related stereotypes have become increasingly negative over the years, with older people being seen as people who consume economic resources rather than as people who bring a financial benefit to society (Ng. et al., 2015).

Today, ageism is one of the most accepted forms of prejudice compared to racism or sexism (Nelson, 2002). It is ubiquitous in different places and cultures in the world, such as Japan (Gerlock, 2005), East Africa (Ogonda, 2006), being also incorporated into Western culture. The same is valuable in Europe and the United States where the outlook on youth tends to be more positive. "Young people are seen as the embodiment of beauty, vitality and longevity. The elderly, on the other hand, represent failure" (Chonody & Teater, 2017, p. 27). In fact, in society this view is strengthened, and negative characteristics are attributed to the elderly for the simple fact that they are "old", causing the loss of status and value in society for the elderly group (Kite & Johnson, 1988),

However, although this phenomenon is present all over the world, in developed countries (which have a well-defined system of social protection, compared to poor countries) there is a higher level of awareness regarding the negative effects produced by the phenomenon of marginalization with more measures that have been taken to reduce them (Stanciu, 2016). In Romania, the phenomenon of stigma is not yet recognized, along with other problems that occur in the lives of the elderly. In a study conducted on a sample of 200 young people and 30 elderly people in Romania, it was concluded that the elderly are stigmatized for the simple fact that they are a certain age, this phenomenon being directly influenced by the level of interaction between young and old as well as the educational level of young people (Stanciu, 2016).

The consequences of Ageism

Compared to other forms of discrimination, ageism is experienced by many more people. Thus, "old age" is a category that almost all people

will one day belong to. Being in a privileged position (for example, at the young age) people find it more difficult to realize the importance of age, even if this group includes people who experience discrimination based on another social characteristic, such as gender. Thus, young people easily place the elderly in a socially excluded group, although the elderly were at one time young, and the relationship between these two generations should still be different (Greenberg, Schimel & Martens, 2002).

But negative myths and conceptions have created not only a limited social perspective on the aging process (Chonody & Teater, 2017), but also a phenomenon with a psychologically important influence for the elderly (Dionigi, 2015). Over time, several studies have come to support this idea, an example being the study conducted by Levy & Benaji (2002), that has shown that ageism could affect not only the physical functioning, but also the cognitive component of the elderly. Also, research in the field of gerontology shows an increased rate of depression, anxiety and suicide in this population segment as a result of this phenomenon (Breaz, 2015). Other authors, such as Hagood and Gruenewald (2016) have been shown that exposure to negative aging-related messages affects short term memory, with the results raising the question of long-term exposure to such messages. In this direction, a meta-analysis that focused on the effects of the subconscious or implicit level (priming effect) that positive and negative age-related stereotypes have on behavior concluded that, at the subconscious level, negative stereotypes have a higher influence compared to the positive ones (Meisner, 2011).

The study conducted by Levy et al. (2006) goes in the same direction, evaluating the role of positive perception of stereotypes in physical recovery after acute myocardial infarction. In the study conducted by the authors, the expectations towards the recovery of patients acted as a mediator, the conclusions of the study claiming that positive stereotypes play an important role in health (Levy et al., 2006). An example is the research conducted by Schroyen et al (2016) which showed that elderly patients with cancer face double stigma due to the negative perception of old age and cancer, all of these having an influence on psychological health and their overall health. Depression, anxiety and wellbeing in old age

The regression period, also known as the third age, is the period in which fragility and involution predominate (Schiopu & Verza, 1997), the next stages being characterized by the appearance of clinical problems-especially for people in early old age, also known as “young-old” and the mental experience of the terminal stage for people in the second part of old age, over the age of 85 (“oldest-old”) (Bunker-Hellmich, 2015).

In 2008, the World Health Organization argued that by 2020, depression will become globally the third leading cause of disability, making it a major contributor to health care costs (Rodda, Walker & Carter, 2011).

Among the general population, depressive syndrome is easily recognizable when associated with moral pain and psychomotor slowness (Ionescu & Blanket, 2013). However, in the elderly it is more difficult to recognize, being associated with disability, increased mortality and poor physical health (Rodda, Walker & Carter, 2011).

People with depression in old age are a heterogeneous group with symptoms ranging from mood disorder to major depression. A recent meta-analysis showed that the prevalence point for major depression is over 75, ranging from 4.6% to 9.3%, while the rate for mood disorder can range from 4.5% to 37.4% (Meeks et al., 2011).

Another meta-analysis conducted on people over the age of 55 showed that mood disorder is 2 to 3 times more prevalent than major depression. Studies also shown that many of the depressive episodes in old age are more recurrent than in the first onset (Rodda, Walker & Carter, 2011). Moreover, the rate of depression, anxiety and suicide in this segment of the population increases with the appearance of feelings of uselessness, unpleasant or unwanted in society (Breaz, 2015).

Regarding people over the age of 60, depression could be spread both in the community (Feng & Ng, 2008) and among people who have been hospitalized due to serious physical illness or who have been institutionalized due to reduced physical and/or cognitive functioning (Akyol et al., 2010). Also, the prevalence of depression is much higher in brain disorders including dementia, Parkinson's disease, strokes but also in other diseases such as diabetes or cardiovascular disease. Moreover, the estimated prevalence for Alzheimer's depression is about 30% and ranges from 0% to 86% (Alvarez et al., 2011).

Anxiety disorders have long been considered a problem of childhood and early adulthood. Although their prevalence in the elderly ranges from 10% to 20% - more common than other common psychiatric problems, such as dementia and depression (Mackenzie & El-Gabalawy, 2014), anxiety disorders continue to receive less attention. However, aging anxiety could also occur among adults of any age (Brunton & Scott 2015), and is also widespread among young people (Cummings et al., 2014).

For most anxiety disorders, the prevalence decreases with age, except for some of them, which are much more common among the elderly and also among patients with dementia (Aggarwal, Kunik & Aasghar-Ali, 2017). Fear of falling at old age, for example, has similar characteristics to

specific phobia, the prevalence of this syndrome increasing with age and reaching 20.8% to 85% (Scheffer, Schuurmans & van Dijk, 2008). Although the history of falls is a risk factor for anxiety, it can still occur among individuals without a history of falls. Regardless of this situation, fear has a significant impact on quality of life and independence (the elderly becoming dependent on other people / family members) (Adams, Martinez & Vickerie, 2011).

Anxiety disorders are also associated with low socioeconomic status, disability, illness (Prina, Ferri & Guerra, 2011), or female gender. According to DSM-5, there are more women suffering from anxiety compared to men (with a ratio of 2: 1) (DSM-5, 2013).

A study conducted by Herrera, Montorio and Cabrera (2015) showed that the older people who show symptoms of anxiety tend to recognize less positive information and show more negative emotions in the process of recalling events that have occurred throughout life. On the other hand, people with a lower level of anxiety have more positive than negative memories.

Given the prevalence of negative stereotypes related to old age, it is not surprising that anxiety about aging is prevalent among this group. It is characterized by fear of losing independence, deteriorating health, and loneliness (Bousfield & Hutchison, 2010). Although there is less research on anxiety among the elderly than on stereotypes, however, the results of the studies shown a significant influence of anxiety on the health of the elderly (Brunton & Scott 2015). Similarly, these studies were connducted in Western and European cultures (Ramirez et al., 2018).

Last but not least, the study conducted by Roco (2016) shows that in the case of the elderly there is a decline in some of the personality traits, especially in the age group of 50-59 years compared to the age level 40-49 years. Also, anxiety and depression in old age is explained by disinterest for the future. The intervention of the psychologist at pre-senescence ages to stimulate personality traits that are vulnerable due to aging will be considerably more effective than acting only at the age of old age (Roco, 2016).

Wellbeing in old age is still a sufficiently unexplored field. For this reason, the literature of recent years (Kahneman et al., 2004) has proposed the Day Reconstruction Method by which people are asked to reconstruct the previous day, including sleep periods and activities they have had throughout the day. According to studies that have used this method (Ishio & Abe, 2017; Oerlemans, Bakker & Veenhoven, 2011), the activities selected by the elderly and middle-aged people appear to be similar. They began to focus not only on negative mental health, but also on positive

mental health, by promoting the idea of well-being. For example, the study by Aldwin, Choun & Spiro (2017) supports the idea that war veterans need to focus more on the positive aspects of military service, with this being an important resilience resource for optimal development in old age.

Also, a research that considered the study of well-being in old age, concluded that men and women do not differ in terms of life satisfaction, but predictions of satisfaction differ by gender. Thus, a negative self-assessment of health and depressive symptoms were associated with low satisfaction among women, while loneliness due to the death of the partner was an important predictor in men (Berg, Hassing, McClearn & Johansson, 2006).

Last but not least, there are studies showing that although older people have more health problems when they are over 80 and have a low level of physical health satisfaction, they may still have higher levels of family or social satisfaction. (Ryan, 2016). This could be explained by the fact that grandchildren and children play an important role in the quality of life of older people. In this sense, a study conducted on the Romanian population showed that people who receive two-way support, those who feel useful, with a positive outlook on life, extroverted and sociable people have a better quality of life (Rada, 2013). On the other hand, people who perceive negative discrimination related to age from those around them have a lower level of well-being (Garstka, Schmitt, Branscombe & Hummert, 2004).

In the field of positive psychology, a study by Kim et al. (2013) at the University of Michigan on the influence of elderly dispositional optimism, they concluded that optimism may play an important role in protecting against stroke, with a greater degree of optimism being associated with a lower risk of stroke. In the same direction, Wurm & Benyamini (2014) emphasized the possible role that optimism could play as a moderator in the impact of perception on old age. Thus, the presence of optimism can mitigate the effect that negative perceptions on the old age can have on the health of the individual.

This paper focuses on ageism among in Romania. Most studies that highlighted the relationship between ageism and mental health have been conducted in the United States, compared to Europe, where the scientific world is facing with a rather great lack of studies in the field of Gerontology in general, but also on the relationship between these two concepts in particular.

Among research in this area, they have focused on the study of depression in the elderly (Cuijpers, Smit & Andersson, 2009), highlighting that the experience of marginalization has been associated with symptoms of major depression, other studies in the United States associating

discrimination in older people with anxiety (Vogt Yuan, 2007) or other mental health problems (Luo et al., 2012).

In this context the present study aims to provide empirical evidence to help explaining the effects of stereotypes and prejudices (ageism) on the elderly, especially on the mental health area, in Romania, on a sample of people aged 55 years or older. Thus, 2 objectives were taken into account: 1) highlighting the relationship between ageism and mental health, measured by depression, anxiety and wellbeing (as an indicator of positive health); 2) examining the moderating effect of age on this relationship.

Materials and methods

Participants

The research was conducted between May 2019 and November 2019, on a sample of 84 participants. Following the collection of questionnaires, it was found that 202 participants completed the ageism questionnaire. From these, only 84 respondents completed all the four instruments, answering all their items, including the questionnaire assessing psychological well-being.

The final sample used in this paper included 84 participants (average age = 70.46, SD = 10.46) with 56% women and 44% men, 76% people with secondary education and 24% people with higher education. Out of the total number of respondents, 14% were hospitalized at the “Ana Aslan” Institute, and 86% of the respondents were chosen using the snowball technique.

A number of 118 participants were eliminated from the statistical analyzes for this research, because they only completed the questionnaire for the evaluation of ageism. However, they were taken into account in the statistical analyzes specific to the calculation of the psychometric properties of the questionnaire assessing the perceived discrimination.

The inclusion conditions in the sample were: people over 55 years and also without degenerative diseases. For this reason, data collection has been done both at the National Institute of Gerontology and Geriatrics "Ana Aslan", where the number of people over 55 is much higher, as well as using the snowball technique (72 people recruited included in the study). Basically, acquaintances identified potential respondents among those in their entourage, preferably parents or close relatives aged 55 or older, and applied the questionnaires received. It was mandatory that the investigated persons should be in a close relationship with them in order to obtain a responsible assumption in completing the questionnaire. Given the construction of the sample, its professional composition is heterogeneous.

The data collection has been done after obtaining the approval from the management of the institution. Participation in the study was voluntary. In fact, respondents were informed through the Informed Consent on the purpose and initiators of the study, respectively that the study aims to assess stereotypes and prejudices in old age and aims to investigate research hypotheses, not to assess individual performance or classifying participants according to certain criteria. They were informed about the study procedure and the instructions, explaining that the study involves answering some questions, that it is important to answer as honestly as possible during the completion and that there are not right or wrong answers.

Participants were also reminded that the agreement to participate in this stage does not in any way represent their obligation to participate in subsequent stages (if necessary), as well as the conditions for withdrawal from the study (ie the fact that that respondents may withdraw from the study at any time, without negative consequences). Also, the participant were assured about the participation confidentiality and about the new data protection policy (GDPR – "General Data Protection Regulation"). Finally, the volunteers were asked to sign the informed consent before the participation in the study, while ensuring that there are no ambiguities and that the information related to the participation in the study was understood and read carefully.

Instruments

Depression and anxiety were assessed separately for mental health indicators, in order to identify whether ageism acts differently on each. Wellbeing was also been used as an indicator of positive mental health. The concept of ageism has been taken from previous studies, being used either as such or replacing it with synonyms such as discrimination, stereotypes or prejudices.

For the collection of socio-demographic characteristics, there were used questions regarding the gender of the participants, age, nationality, city of residence, marital status, profession and educational level.

Participants also completed four questionnaires, applied in the specified order: Ageism Survey (the scale that assesses the level of age discrimination perceived by participants through 20 items related only to the negative aspects of ageism) where the calculated value of the Cronbach Alpha coefficient on Romanian sample of this scale is .72; $\alpha > 70$, the statistically significant correlation coefficients in absolute values being between the minimum value .14 and the maximum value .63; all items in the questionnaire are restricted to a single factor) (Palmore, 2001), the scale consisting of 7 items that assess the level of anxiety (GAD-7 - Scale for

Generalized Anxiety Disorder) where the value of Cronbach Alpha = .91; α> 70 (Spitzer, Williams & Kroenke, 2006), CES-D Scale (Depression Scale Developed by the Center for Epidemiological Studies) that assesses the level of depression through 20 items (Radloff, 1977; Stevens, Constantinescu, Uscătescu, Ion & Butucescu, 2011) (where the value of Cronbach Apha is .95; α ≥ 70).

In addition, participants completed the Scale for Psychological Well-Being (Riff et al, 2006; Abbot et al, 2006), consisting of 42 items distributed in 6 subscales (autonomy, environmental control, personal development, positive relationships with others, purpose in life, self-acceptance), with a 6 point Likert response scale. The internal consistency of the test subscales (measured using the Cronbach Apha coefficient) in the sample used in this study varies between α = .95 (for environmental control and autonomy subscales) and α = .96 (for self-acceptance) (α ≥ 70). The data were then analyzed with the statistical program SPSS 20.

For the Ageism scale, developed by Palmore (2001), one of the objectives was to create a Romanian version aimed at translating and adapting items and fidelity analysis, because there is no adapted version of this questionnaire on a Romanian population until now. For this, 226 respondents who answered the questionnaire items were recruited. After analyzing the answers, only 202 respondents were included in the statistical analyzes (respondents who answered correctly and completely the items). In order to obtain the Romanian version of the Ageism scale, all 20 items were subjected to translation and adaptation standards (Breslin, 1970). Table 1 describes the socio-demographic data for calculating the psychometric characteristics specific to the scale for measuring Ageism (Table 1).

Table 1
The basic sample structure used for the Ageism Scale validation

Demographic Characteristics	**n%**	
Gender		
Female	119	59
Male	83	41
Marital Status		
Married	117	58
Single	85	42
Education		
Low Education	163	81
High Education	39	19

Statistical analysis of data

The regression coefficient between ageism and anxiety was first calculated, controlling the role of predictors (age, gender and educational level), followed by the same procedures to be performed later in the case of the dependent variable Depression, as well as in the case of the variable "psychological well-being".

To test the moderating effect of age in the relationship between ageism and depression, anxiety or wellbeing, ageism (V1) and age (moderator) were passed through the centering procedure, generating the interaction variable by multiplying them, and then to perform the multiple regressions between the interaction between the two concepts mentioned above and the 3 indicators of mental health (depression, anxiety and wellbeing).

The instrument scores were calculated according to the scoring guidelines of each questionnaire. Thus, for each questionnaire, global scores were calculated represented by the sum of representative items. For the Ageism scales, the Generalized Anxiety Disorder Scale (GAD-7) and the Depression Scale developed by the Center for Epidemiological Studies (CES-D – "The Center for Epidemiologic Studies Depression Scale ") the sum of the answers was calculated, after each answer to the items of the questionnaire was coded according to the authors' instructions. Regarding the scale for Psychological Well-Being, the sum of the representative items for each of the 6 factors was calculated, as in the case of the previous questionnaires, after the items were reversed according to the requirements of the original questionnaire. At the end, an overall wellbeing score was calculated, summing up the scores obtained for all items.

Regarding the objectives of the present study, the data were analyzed to (a) describe the general relationships between the variables and (b) to test the hypotheses. Descriptive data were obtained by calculating Bravais-Pearson correlation coefficients between continuous variables. Hypotheses were tested using multiple regression models. Anxiety and depression scores were used as indicators of negative mental health, with socio-demographic variables and the score of ageism as the descriptors, while wellbeing was used as an indicator of positive mental health.

To test the extent to which age moderates the relationship between ageism and mental health, the variables involved in the interaction term (i.e., ageism and age) were centered and subsequently multiplied. Multiple regression was used for each of the dependent variables: depression, anxiety and wellbeing.

Results

The correlations between the variables Ageism, Anxiety, Depression, Age, Gender, Educational Level and Wellbeing were first calculated. Table 2 shows the Pearson correlation coefficients for the relationship between the study variables. As seen below, there is a moderate correlation between ageism and anxiety ($r = .411$, $Df = 82$, $p < 0.01$) and ageism and depression ($r = .561$, $Df = 82$, $p < 0.01$), as well as a negative correlation, statistically significant between ageism and psychological well-being ($r = -.540$, $Df = 82$, $p < 0.01$). It can be observed that ageism does not correlate with any of the demographic variables, with very small and statistically insignificant Pearson coefficient values ($p > 0.01$).

It can also be seen that there is a moderate correlation between anxiety and depression, which means that they cannot be considered as having one and the same concept or similar concepts, therefore we cannot calculate the average of the two to represent the concept of mental health together. Thus, they were considered separately for regression analyzes.

Table 2
Pearson correlation coefficients for the relationship between the study variables

Variable	r	n
Ageism r Depression	**.561*** **	84
Ageism r Anxiety	**.411*** **	84
Ageism r Wellbeing	**-.540*** **	84
Depression r Anxiety	**.533*** **	84
Ageism r Age	.045	84
Ageism r Gender	-.085	84
Ageism r Education	.081	84

Note: Ageism was measured with the Ageism scale, Anxiety was measured with using the GAD-7 scale, Depression was measured with the CES-D scale, Wellbeing was measured with the Psychological Well-Being Scale
*** $p < .001$

Depressive symptoms

Regarding the depressive symptoms and to verify to what extent they are impacted by the perceived discrimination, we first calculated the value $R2 = .299$, representing the fact that the percentage of variation of depression explained in the prediction process is about 30% ($F = 9,854$; $p < .001$).

Table 3 shows the regression coefficients obtained for the terms of interaction between ageism, depression and demographic variables. As in the case of anxiety, ageism is significantly associated with depression, again being the only predictor tested whose value is positive and statistically significant (β = .568, p <0.01).

Table 3. Standardized Regression Coefficients

Predictors	**Standardized Regression Coefficients (β)**
Ageism	**.568*** **
Age	-.110
Gender	.050
Education	.029

Dependent Variable: Depression
Predictors: Ageism, Age, Gender, Education
***p<.001

Psychological well-being

In order to demonstrate the impact of ageism on psychological well-being, the Regression model for the interaction between Ageism, wellbeing and demographic variables was first verified. This model also shows that the value R2 = .265, which means that the percentage change in wellbeing explained in the prediction process is about 27% (F = 8.472; p <.01).

According to Table 4, which describes the regression coefficients obtained for the terms of interaction between ageism and wellbeing, it could be seen that ageism is significantly associated with wellbeing. This is again the only one of the tested predictors whose negative value is statistically significant (β = - 546, p <0.01).

Table 4.
Regression coefficients obtained for the terms of interaction between ageism and wellbeing

Predictors	**Standardized Regression Coefficients (β)**
Ageism	**-.546*** **
Age	-.055
Gender	-.075
Education	.034

Dependent Variable: Wellbeing
Predictors: Ageism, Age, Gender, Education
***p<.001

Highlight the extent to which age is a moderator of the relationship between ageism and mental health

The results for the interactions between ageism and age on the one hand and anxiety, depression and wellbeing as dependent variables on the other hand are presented in Table 5.

Table 5
Regression coefficients obtained for the terms of interaction between ageism and age

	β			
	1	2	3	4
1.Anxiety	-	-	-	-
2.Depression	-	-	-	-
3.Wellbeing	-	-	-	-
4. Ageism x Age Interaction	-.115	. -.095	.279	-

Dependent Variables: Anxiety, Depression, Wellbeing
Predictors: Ageism, Age, Gender, Education
p>0.01

Thus, the values of insignificant β coefficients (p> 0.05) suggest that age has no moderating effect on the relationship between ageism and any of the indicators of mental health (positive or negative).

Discussions

According to the above statistical analyzes, a primary conclusion of the current study is that ageism can significantly predict increased levels of depressive and anxiety symptoms, on the one hand, and a lower level of psychological well-being in older people, on the other hand. Specifically, after controlling the demographic variables, the experience of ageism (represented by perceived discrimination in different situations in respondents' lives, both personal and at the level of institutional policies) predicted a higher level of negative mental health and a lower level of of psychological well-being.

These results are partly consistent with previous research correlated ageism to negative mental health (Han & Richardson, 2015), but also to a reduction in well-being (Lyons et al., 2017). Thus, the mentioned studies identified a high level of prediction of ageism on the mentioned variables, while the results of this study support a moderate level of prediction. An example in this regard is the study conducted by Luo et al., (2012) which

pointed out that experiencing any form of discrimination influences mental health.

Regarding the influence of ageism on depression as an indicator of mental health, the study by Cuijpers, Smit & Andersson (2009) concluded that the experience of marginalization was associated with symptoms of major depression. Also, data from a study on Health and Retirement in the United States found that changing levels of age discrimination predicted changes in depressive symptoms over four years (Han & Richardson, 2015).

Regarding the influence of perceived discrimination on anxiety symptoms, the results of the present study showed that the experience of ageism significantly predicted this component of mental health among people in the evaluated Romanian sample. Given the moderate level of prediction obtained in this research, the results are again partially consistent with the results of other previous studies. An example of this is the study conducted in the United States showing that the perception of age discrimination was strongly associated with symptoms of anxiety (Yuan, 2007).

The results of the present study also indicate that a high level of discrimination could significantly predict a lower level of psychological well-being among the elderly. In this regard, a considerable number of studies in recent years highlighted the fact that perceived discrimination could have negative consequences on well-being and life expectancy (Avidor et al., 2017). At the same time, positive attitudes could be associated with higher levels of satisfaction in life, much more positive self-reported mental and physical health, and much lower levels of anxiety and depression (Bryant et al., 2012).

It was also observed that age does not moderate this relationship, so for participants who experienced a higher level of perceived discrimination, being older or at the beginning of the old age does not affect the level of depression or anxiety, and no influence on the decrease or increase in the intensity of well-being could also be observed. These results are not consistent with the results of previous research (ie Lyons et al., 2017), arguing that people in early adulthood who feel and experience stereotypes, prejudice, and discrimination at a much higher level have depressive symptoms or stronger anxiety than in the elderly, as well as a lower level of psychological well-being.

Limits

This research has its limits, the most important being the following: lack of control over the selection of respondents and the small number of participants in the study.

Regarding the first limit, the nature of the study implied a lack of control over the selection of respondents. Thus, both among the people institutionalized within the Ana Aslan Institute and among the other people participating in the study, it is possible that they present diagnoses of depression or anxiety or other types of diagnoses in terms of mental health that we did not target. Also, the is the possibility to have other temporary situations in their lives that could explain the onset of depression or anxiety. To strengthen these results, future studies should also check whether the people under investigation have a diagnosis of depression or anxiety (or other diagnoses), whether they are on medication, and whether to investigate other indicators of mental health or other control variables such as the patient's physical health, which could in some way impact the results of the study. It is important that future studies introduce the variables mentioned above as inclusion /exclusion criteria in order to reduce the risk of obtaining erroneous / biased results due to other factors related to the respondent's health.

However, according to the analyzes mentioned above, it could be concluded that the phenomenon of ageism can have a moderate impact on the mental health indicators tested (depression, anxiety and psychological well-being).

Another limitation is the number of tested subjects, so that the sample of 84 subjects is quite small compared to the number of predictors tested and does not allow division into several groups to check other hypotheses (ie the difference between the group of people hospitalized and that of non-hospitalized people or the significant difference between women and men). In this regard, future studies should focus on collecting more data to extract sufficient information in order to test the hypotheses specified above.

Also, in order to avoid excluding a very large number of respondents due to the lack of data from the questionnaires (as was the case with this research), future studies need to focus on controlling the stage of completing the tools and ensuring that the questions and instructions are understood by the respondents and that there are no incomplete items due to the lack of understanding of the instructions. Also, randomly displaying the questionnaires for each respondent could be an attempt to verify whether the order of the instruments influences the response rate.

Conclusions

This study aimed to investigate on the one hand, the relationship between ageism and the mental health of the elderly and, on the other hand,

the moderating role of age in the relationship between ageism and 3 indicators of mental health (anxiety and depression as indicators of negative mental health and wellbeing as an indicator of positive mental health). The results partially supported the research hypotheses.

Thus, stereotypes and prejudices about old age influence mental health to a moderate extent, while the appearance of depressive or anxiety symptoms, as well as the increase or decrease of depression with exposure and perception of a certain level of discrimination among elderly people do not depend on the age of the people. In other words, whether we are talking about the prejudices and attitudes of others towards the elderly, as well as the policies and institutional regulations that make the elderly feel discriminated, the fact that they are in the early stages of old age, or that they are much older, is not a reason for a change in mental health and well-being.

Solutions and recommendations

Although some of the results do not confirm the research hypotheses, we consider that, however, the results of this study are important for the field of gerontology in general and for perceived discrimination of the elderly (ageism) in particular. Based on these results, future studies should further investigate the influence of stereotypes, prejudices and discrimination on mental health (positive and negative), as well as coping mechanisms that older people use, with an important emphasis on the difference between the results. obtained among institutionalized persons and those obtained among non-institutionalized persons. Thus, future studies should consider recruiting more respondents and monitoring this stage. Based on these results, a suggestion for future research is to replicate and further investigate the role of age in the relationship between ageism and mental health, but also the link between perceived discrimination and mental health using experimental studies or other methods and tools to assess these concepts.

Acknowledgments

I want to thank to Prof. Univ. Mihaela Roco from the Faculty of Psychology and Educational Sciences, University of Bucharest for coordinating the doctoral thesis and for the intense support in completing both the current research and also my development as a researcher. I would also like to thank Dr. Cornelia Rada, First Degree Scientific Researcher at the “Francisc I. Rainer” Institute of Anthropology of the Romanian

Academy, Bucharest for the scientific input offered during this research and to Prof. Univ. Stefan Agrigoroaei, Faculty of Psychology and Educational Sciences, UC Louvain Belgium for the scientific interest and involvement in the current study. Last but not least, I want to thank to the "Ana Aslan" Institute of Gerontology and Geriatrics for the access to the participants, without which this study would not have been possible.

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Chapter 5

Cognitive reserve and cerebral atrophy in patients with neurodegenerative pathology - the first Romanian clinical study

Maria MOGLAN[1], Voicu BOSCAIU[2], Cătălina TUDOSE[1]

Abstract

Clinical research shows that neurodegenerative pathology symptoms occur earlier in people with a lower level of education and later in those with a high level of it, cognitive reserve acting as a moderator of the relationship between changes in the brain and the clinical profile of neurodegenerative pathology (Stern, 2009). Subsequent prospective studies have shown that for about 25% of the elderly who showed normal variation in neuropsychological assessments, Alzheimer's disease neuropathology was found post-mortem, which led to the conclusion that this variation was determined by the existence of a cognitive reserve (Esiri et al., 2001). The present chapter aims to study the link between the level of cognitive impairment, the severity of cerebral atrophy and the level of education on a sample of people with cognitive impairments who showed up at the Memory Center between 2011-2016.

Key words: *cognitive reserve, brain atrophy, neurocognitive disorder, Alzheimer's disease, neurodegenerative disease, elderly person, Memory Center*

Cognitive reserve is the sum of impairment that can occur in the brain beyond which the symptoms of the disease begin to manifest (Stern, 2009, 2013).

Cerebral atrophy is a disorder of the central nervous system characterized by gradual and progressive loss of neural tissue and neurological function (WHO, 1993).

Neurocognitive disorders represent a category of mental health disorders that primarily affect cognitive abilities, but also learning, memory, perception and problem solving**.** Neurocognitive disorders (NCD) include mild, moderate, and major neurocognitive disorder (known as dementia). NCD are defined by cognitive impairment, usually represent a decline and may have a basic brain pathology (DSM-5 APA, 2013). The DSM-5 defines six key areas of cognitive function: executive function, learning and memory, perceptual-motor function, language, complex attention, and social cognition.

[1] [1]-Romanian Alzheimer Society, "Carol Davila" University of Medicine and Pharmacy Bucharest

[2]-"Gheorghe Mihoc-Caius Iacob" Institute of Mathematical Statistics and Applied Mathematics of Romanian Academy

Address correspondence to: Maria Moglan, Romanian Alzheimer Society, 15 Austrului Street, 2nd District, Bucharest, Romania, Zip Code 024073, Ph.: +40-726-966-122; Fax +40- 021-334-89-40. E-mail: mariamoglan011@gmail.com

Alzheimer's disease is a progressive degenerative disease of the brain that causes an increasing deterioration of a person's cognitive functions, simultaneously with the loss of intellectual abilities and associated with psychological and behavioral disorders (BPSD).
Neurodegenerative disease is the generic term for a number of conditions that mainly affect neurons in the human brain (Burns & Robert, 2009).
Elderly person - the person who has reached the age of 65, which is the age associated with the onset of old age, when the whole body becomes more vulnerable. The main biological changes that characterize physiological aging are decreased energy, sleep disorders, changes in the general appearance of the skin, and the onset of graying, decreased ability to exercise, changes in posture, changes in breathing, metabolism and internal temperature. But physiological aging also refers to the degradation and aging of the nervous system. This is due to the reduction in the body's ability to meet the very high supply requirements of the brain, as well as the irreversible process of reducing its volume. Biological changes in the brain cause an intensification of the aging process of the peripheral sense organs (Gal, 2009).
Memory Center - specialized center where the detection, diagnosis and treatment of neurocognitive disorders based on a complex clinical evaluation (psychiatric, neuropsychological, neurological, geriatric) are realized by a multidisciplinary team of psychologists and doctors specialized in psychiatry, neurology or geriatrics.

Introduction

In Europe, in the last 50 years, life expectancy has increased from 69 years (1974-1975) to 74 years in 2011 (Comper, 2011), and is expected to rise by 6 years on average until 2030, thus reaching the highest level so far (Jakovljevic et al., 2016). If the demographic aging is the common element of the European states, the decrease of the birth rate represents for Romania an important factor in the economic-social equation. The increased life expectancy is due to progress, both in the medical and in the social and economic area. If, until 1990, Romania had a low degree of demographic aging, the last decades are notable for the increase in the number of elderly people, simultaneously with the decrease in birth rates.

In 2015, according to statistics provided by the National Institute of Statistics (NIS), in Romania, the number of inhabitants had reached 19.9 million compared to 23.2 million in the 1990s. These figures speak of the deterioration of the demographic scaffold with repercussions for the coming decades (2020-2030), but also for the horizon 2050 (Gheţău, 2015).

These problems are joined by the aging of many generations, corresponding to the 1950-1970 period and their replacement by the numerically reduced generations after 1970, and the migration of the young population which comes to complete the worrying demographic picture. These phenomena act on the political, social, economic, but also medical balance (Gheţău, 2015).

Recent studies have shown that many problems, considered inevitable, are not due to aging itself (Roco & Moglan, 2015), but are mainly related to lifestyle factors and pathologies (Papalia et al., 2006). Thus, several types of aging are distinguished: one continuous throughout life which represents the gradual process of deterioration of the body and another, characteristic for each person, and which is a consequence of disease and abuse (Maddox & Busse, 1987; Horn & Meer, 1987).

One of the theories of biological aging is the genetic programming which claims that aging is related to developmental program imprinted in genes, deactivating some of these genes before age-related losses are visible (Moglan & Tudose, 2015). Genetic influence manifests itself after the age of 60, so the APOE2 and 3 genes protect against Alzheimer's disease and cardiovascular disease, while APOE4 increases the risk of the two pathologies (Christensen et al., 2006). The gradual and differential impairment, as well as the speed and severity of the aging process are extremely variable and depend from one individual to another (Fontana & Klein, 2007; Tudose, 2001).

Changes in the brain are generally discrete in healthy individuals, ranging from one individual to another (Burke & Barnes, 2006; Finch & Zelinski, 2005), with memory decline beginning at age 60. The plasticity of the brain ensures the "reorganization of neural circuits" thus responding to "the challenges of neurobiological aging" (Park & Gutchess, 2006). Thus, both the volume and the weight of the brain are gradually reduced, especially in the frontal cortex, the area that coordinates affectivity and executive functions (von Hippel, 2007). Loss of the number of synapses (neural connections) leads to a decrease in the number and / or density of dopamine neurotransmitters. The layer of myelin (white matter) that promotes the movement of nerve impulses from one brain area to another thins, resulting in cognitive and motor damage (Andrews-Hanna et al., 2007). However, in the hippocampus - a brain formation involved in learning and memory, research has found evidence of cell division in the elderly (Eriksson et al., 1998; van Praag et al., 2002).

Pathological aging can lead to mental, emotional and behavioral disorders, but also to the presence of risk factors, such as depression. According to Bouchard (2004), 40-50% of the risk that leads to major depression is due to heredity. Due to the influence of several genes, the vulnerability occurs in interaction with environmental factors such as: stressful events throughout life, loneliness, substance abuse, but also a whole category of relationship loss, such as divorce, separation, widowhood or functional losses (chronic disabilities, cognitive impairment) (Sterlemann et al., 2010). The lack of emotional support from parents in childhood was

associated with problems in old age: depressive symptoms or psychosomatic disorders. For example, mental functioning, disabilities, and even quality of life depended more on depression than on chronic medical conditions (Noel et al., 2004).

The presence of severe behavioral or cognitive disorders related to permanent brain damage and affecting daily activities is known as dementia (DSM IV - APA, 1994). This is a syndrome, usually of a chronic or progressive type, in which there is an impairment of cognitive function that affects memory, thinking, orientation, comprehension, learning ability, language and judgment. Consciousness is not affected. The impairment of cognitive function is usually accompanied and sometimes preceded by impairment of emotional control, social behavior or motivation (WHO, 2017).

The World Health Organization's 2015 Report (WHO, 2015) shows that there are almost 900 million people aged 60 and more living worldwide, of whom 46.8 million people have neurodegenerative disease. Increased life expectancy contributes to the rapid increase in this number and is associated with an increased prevalence of chronic diseases (Tudose & Moglan, 2015). It was found that the phenomenon of aging shows, along with changes in the brain, a corresponding increase in comorbidity of diseases. Studies have shown that at least 80% of the elderly have at least one chronic condition, and 50% have at least two (Moore et al., 2004; Papalia et al., 2006).

Between 2015 and 2050, the number of older people living in high-income countries worldwide is expected to increase by only 56%, compared to 138% in middle-income countries and 185% in low-income countries (Alzheimer's Disease International, 2012). Neurodegenerative pathology is responsible for more years of life with disabilities in the population over 65 years (11.2%) than for cardiovascular disease (5%) or cancer (2.4%). The most vulnerable category of patients is people with Alzheimer's disease. The impact of the disease can affect both the sick person, his family, and the society in general (Alzheimer’s Disease International, 2012).

According to estimates by the Organization for Economic Cooperation and Development (OECD, 2013), in Romania, the prevalence of the disease is 4.7% for those over 60 years of age.

The number of people affected in 2013 is approximately 270,304, according to Alzheimer's Europe, this number representing 1.26% of the country's population at that level. The number of people with this disease is slightly lower than the European Union (EU) average, only 1.55%. Table 1 shows the estimated number of people affected for each age group, starting at ther age of 30.

Table 1
Prevalence of neurodegenerative pathology in Romania (Alzheimer Europe, 2013)

Age group	Men with dementia	Women with dementia	Total
30 – 59	7459	4252	11711
60 – 64	1145	6095	7241
65 – 69	7216	7184	14401
70 – 74	11215	19206	30421
75 – 79	19986	34356	54342
80 – 84	23960	47881	71841
85 – 89	14542	41079	55621
90 – 94	4415	17304	21719
95+	546	2463	3009
Total	90484	179820	270305

Cognitive and functional decline in neurodegenerative pathology and behavioral and psychological symptoms generated by the disease are, also, the cause of degradation in quality life for those affected by this illness and their families, which is the main reason for further institutionalization and generates significant societal costs.

The behavioral and psychological symptoms generated by the disease (BPSD) are those that most affect the quality of life of patients with NCD and their relatives; they are generated by multiple causes, out of which the neurodegenerative process is the most important one. Other causes of their occurrence are given by disorders such as depression, anxiety, irritability, apathy, but also somatic comorbidities usually present in the elderly (Balsis, Carpenter & Storandt, 2005).

Sensory deficiencies (hearing, seeing) can determine psychological and behavioral disorders through a misinterpretation of environmental stimuli (Cummings, 2004).

Affective disorders such as worry, anger, frustration, play a significant role in the patient's life, along with other needs such as affection or company (Alcove Project Synthesis Report, 2013). Moreover, decreased brain function can reduce the ability to inhibit unwanted or irrelevant thoughts. Studies have shown that the cerebral amygdala plays an important role in managing emotions, a role that changes with age. It was found that the reactions of the elderly to negative events decreased, compared to young adults. Older adults are more effective at solving some types of social problems than younger adults, in part because they can manage negative emotional reactions more effectively (von Hippel, 2007).

In this context, the earlier the patient is diagnosed and receives proper treatment, the slower the disease progresses and the better the quality of life of the patient and his family are (Papalia et al., 2006). The therapeutic approach that integrates the theory of cognitive reserve can lead to improved quality of life of patients affected by neurocognitive disorders, but also to a significant reduction in costs related to patient care, costs that affect both family and community and society as a whole (Stern, 2009).

Neurodegenerative pathology

Neurocognitive disorders usually occur after mid-life and are characterized by insidious onset and gradual decline. In the early stages, this pathology is characterized by large-scale degeneration of a specific neural network of the brain, which is associated with clinical manifestations of the disease in terms of cognition, memory, behavior and emotional symptoms (Seeley et al., 2009). Simultaneously with the evolution of the disease, the pathological process may become more diffuse and widespread in other brain networks, following a well-established model of organization (Li et al., 2012). Although post-mortem pathological studies are considered a gold standard for determining the diagnosis and etiology of the disease, clinical evaluations that include neurological, neuropsychological, and neuroimaging studies are the basis for establishing differential diagnosis (Seeley et al., 2009).

Long-term memory, judgment, attention and ability to concentrate, temporal-spatial orientation, language, executive functions gradually deteriorate. In the severe stage of the neurocognitive disorder, the language becomes very poor or unintelligible, incontinence, eating and walking disorders occur and the person needs permanent care and supervision (Cummings, 2004; Small et al., 1997).

Cognitive reserve - definition

The idea of cognitive reserve results from the repeated observation that there is not a direct relationship between the degree of pathology of the brain or brain lesions and the clinical manifestation of those lesions. For example, Yu et al. (1989) described 10 cases of elderly women who did not have cognitive problems and in whom, post-mortem, the pathological research showed the presence of Alzheimer's disease in the advanced stage. The authors concluded that these women did not express the clinical features of Alzheimer's disease because their brain volume was higher than average, giving them a "brain reserve."

Cognitive reserve is the sum of the damages that can occur in the brain beyond which the symptoms of the disease begin to manifest (Stern, 2009, 2013).

Brain reserve capacity (CRC) is a hypothetical construct (Yu et al., 1989) that includes brain size and number of synapses, which differ from person to person.

Satz brings together the two concepts in formulating the critical threshold theory beyond which clinical symptoms appear. Cognitive reserve (CR) depends directly on the reserve capacity of the brain, this is the major factor in explaining threshold differences in the onset of clinical symptoms (Satz, 1993).

Beyond the critical threshold, specific clinical or functional deficits occur. The cognitive reserve model suggests that the brain is actively trying to cope with brain damage by using pre-existing approaches to cognitive processing or by compensatory approaches (Stern, 2002).

People with an increased reserve capacity of the brain will be able to cope with the problems of daily life, for the same amount of brain damage. Thus, the same amount of brain damage or pathology will have different effects, even if CRC (e.g., brain size) is kept constant (Stern, 2002).

The concept of CR already offers an existing explanation, as many studies have shown that higher levels of intelligence and educational and occupational performance are good predictors of how people can cope with brain damage before demonstrating functional impairment.

The CR hypothesis states that tasks are processed in a way that allows them to cope effectively with brain damage, rather than saying that these people have anatomically different brains than those with less brain reserve (e.g., they have more synapses).

Stern (2004) suggested that the presence of cognitive reserve could have two components: neural reserve and neural compensation. Neural reserve refers to synaptic networks, because they are more efficient or have a higher capacity. The use of CR is a normal process present in healthy people. This kind of people can use these networks when faced with increased activity requirements, the networks could also help a person cope with brain pathology (Stern et al., 2004).

Neural compensation refers to the process by which those suffering from neurocognitive disorders use synaptic structures or networks (and therefore advanced cognitive strategies) to compensate for brain damage. These networks are not normally used by people with an intact brain (Stern, 2006; Wingfield & Grossman, 2006). These concepts are particularly important when trying to formulate and interpret functional imaging studies that investigate cognitive reserve.

Measurement of cognitive reserve

Anatomical measurements, such as brain volume, cerebral cortex thickness, head circumference, synaptic number, or dendritic branching (Stern, 2002), are effective measures of cognitive reserve. Therefore, cognitive reserve can be a sum of many aspects of life experience, which was also thought to be CR.

Descriptive variables of life experience include socio-economic status, income or employment. The level of education was also one of the variables currently used. Literacy could be a better predictor of CR than the number of years of formal education, as it is a direct measure of educational outcomes (Manly, 2003).

Like measuring the IQ and various cognitive functions, the level of education could also be a marker for innate intelligence, which can be based on genetics or environment. Some studies suggest that an estimate of IQ or premorbid IQ may actually be a stronger measure of cognitive reserve in some cases (Albert & Teresi, 1999; Alexander et al., 1997). However, the level of education or other life experiences probably confer a reserve which supplements the one obtained from innate intelligence.

Studies have shown separate or synergistic effects for a higher level of education and professional level, as well as for leisure activities, suggesting that each of these life experiences contributes independently to the cognitive reserve (Evans et al., 1993; Mortel et al., 1995; Stern et al., 1995).

A prospective study showed that the assessment of IQ at the age of 53 was influenced separately by the knowledge gained from childhood, the level of education and the occupation during adulthood. These observations point out that the CR is not fixed; at any time of life CR is the result of a combination of factors (Rocca et al., 2011).

The simplest explanation for how CR prevents the clinical effects of AD is that experiences associated with more CR do not directly affect brain reserve or AD development. In fact, CR allows certain people to cope better with the pathology and to remain clinically intact for longer periods of time. This has been the working CR hypothesis underlying the design and interpretation of many studies (Stern, 2005).

However, as mentioned earlier, many of the factors associated with CR can also have a direct impact on the brain itself. There is a demonstrated relationship between IQ volume and brain volume (Willerman et al., 1992). Thus, the literature suggests that brain volume and aspects of lifetime exposure are predictive of differentiated sensitivity to the effects of traumatic brain injury (Badan et al., 2003).

Stimulating environments and exercise have also been shown to promote neurogenesis (Brown et al., 2003). In addition, there is evidence to suggest that a rich cognitive environment could act directly to prevent or slow the evolution of AD (Lazarov et al., 2010).

The relationship between cognitive reserve and neurodegenerative pathology

A number of studies have examined the relationship between the variables associated with CR and the incidence of dementia. Parallel studies have found a relationship between these variables and cognitive decline in normal aging. Several studies in India (Chandra et al., 2001), in England (Paykel et al., 1994) and in the United States (Hall et al., 2000) did not report any association between dementia and level of education. However, the low incidence of dementia in subjects with higher education was reported by at least 8 cohorts in France (Letenneur et al., 1994), in Sweden (Qiu et al., 2001), in Finland (Anttila et al., 2002), in China (Zhang et al., 1990) and in the United States (Evans et al., 1993).

Similar associations have emerged in a comprehensive analysis of prospective studies based on the European population of people aged 65 and more (Launer et al., 1999). There is also evidence of the role of education in the cognitive decline associated with aging, with several studies on normal aging reporting slow cognitive and functional decline for people with higher education (Albert, 1995).

These studies suggest that the same educational factors that delay the onset of dementia allow people to cope more effectively with the brain changes encountered in the normal aging process. In a diverse ethnic cohort of dementia-free seniors in New York, increased literacy has also been associated with a slower decline in memory, executive function and language skills (Manly et al., 2005).

No equivocal association was found between occupation and the incidence of Alzheimer's disease in several longitudinal population-based studies (Helmer et al., 2001). In 2 other prospective studies, the presence of the occupational factor did not predict the incidence of dementia (Paykel et al., 1994) or its predictive value could have been mediated by educational status (Evans et al., 1997). However, several studies have noted a relationship between the level of employment with daily activities and the incidence of dementia (Stern et al., 1994).

Professional achievements have been observed to have independent effects or to often interact with the level of education. In a survey of the German population, only the fact that people live in an inadequate space

was associated with an increased risk of dementia, while social indicators such as isolation, low frequency of social contacts inside and outside the family circle, lack of social support and loneliness have not been shown to be significant (Bickel & Cooper, 1994).

An important research in France has shown that traveling, engaging in less common creative activities, and knitting have been associated with a lower risk of dementia (Fabrigoule et al., 1995). Usual household activities and gardening have also protected against the onset of dementia in China (Zhang et al., 1990).

In Sweden, a longitudinal study showed that the presence of an extensive social network was a protective factor against the development of dementia (Fratiglioni et al., 2000). The same group reported later that involvement in cognitive, social, and productive activities was associated with a low risk of dementia (Wang et al., 2002).

Participation in a variety of leisure activities characterized as intellectual (e.g., reading, using games, attending classes) or social (e.g., visiting friends or relatives etc.) was assessed in another populational study on elderly people without dementia in New York (Scarmeas et al., 2001) with positive results in maintaining a low incidence rate of dementia.

Another prospective study shows that people with long-term leisure time were 38% less likely to develop dementia. The frequency of participation in common cognitive activities (e.g., reading a newspaper, magazine, or books) in this reseach was initially evaluated for 801 elderly Catholic nuns and priests without dementia (Anttila et al., 2002). It was observed that a one-point increase in the MMSE score was associated with a 33% reduction in the risk of AD. Involvement in cognitive activities has also been associated with lower rates of cognitive decline. Finally, in another prospective cohort in New York, participation in leisure activities, especially in reading, playing cards or musical instruments, and dancing was also associated with a reduced risk of dementia. Increased participation in cognitive activities was associated with decreased memory impairment in this study (Manly et al., 2005).

In contrast to the above studies, in which a cognitive reserve was associated with better outcomes, a number of studies in patients with AD suggested that those with a similar cognitive reserve had poorer cognitive testing results (Stern et al., 2009; Tuckers & Stern, 2011).

In a prospective study of patients with AD, 54 patients with higher education or professional results died earlier than those less affected by the disease. Although at first these findings seem counterintuitive, they are consistent with the CR hypothesis.

The hypothesis predicts that, at any assessed level of clinical severity, the underlying pathology of AD is more advanced in patients with CR than in healthy patients.

This would lead to the onset of the clinical disease when the pathology is more advanced, as suggested by the incidence studies examined above. The presence of such disparities in the degree of pathology would be present in the more advanced clinical stages of the disease. At some point, the higher degree of pathology in patients with large reserves would lead to a faster death.

Although one study did not replicate this finding (Geerlings et al., 1997) other research was applied to a group of patients with more advanced dementia (Geerlings et al., 1999).

The results showed the presence of cognitive reserve associated with a faster cognitive decline in patients with AD (Stern et al., 2000). The explanation for this finding is similar to the one above, namely that, at some point, the pathology of AD should become severe enough for the cognitive reserve to lead to rapid death.

Cognitive reserve and neuroimaging

Several studies of CR imaging in AD measured brain activity for that pathology (DeCarli et al., 1992). In patients with the same clinical severity, this research identified negative correlations between brain activity and years of education, premorbid IQ, level of daily and leisure activities (Alexander et al., 1997). Negative correlations are consistent with the CR hypothesis that shows that at a certain level of clinical severity of the disease, a person with a higher level of CR should have a severe neurocognitive disorder.

These findings were confirmed in a prospective study by a subsequent neuropathological analysis which showed that education changes the association between AD pathology and the level of cognitive function: for the same degree of brain pathology there was a better cognitive function with each year of education (Bennett et al., 2003).

Cognitive stimulation studies can be used to elucidate the nature of CR. Stern and colleagues tried to determine whether or not AD pathology alters the brain networks that ensure the performance of a memory task, carefully controlling the difficulty of the task (Stern et al., 2000).

Positron emission tomography (Richards and Sacker, 2003) has been used to measure brain activity in healthy patients and in elder people while performing a verbal recognition task. The difficulty of the tasks was chosen, adjusting the size of the list of words that each subject had to remember so that the accuracy of the recognition of each subject was 75%. In healthy

elderly, a network of areas of the brain involving the left anterior cingulate regions, the anterior islet, and the left basal ganglia were activated during this task. Only 3 patients with AD presented this network in a similar way (Bennett et al., 2003). This network of brain areas may be subject to a neural reserve, as it appears to be chosen to meet the requirements of the activation task, and the differentiated choice of network is directly related to the ability to perform the task (Richards & Sacker, 2003).

People who are able to activate this network to a greater extent may have a higher CR, so patients with AD have accessed a different network during the task performance, consisting of the left posterior temporal cortex, calcareous cortex, posterior cingulate, and vermis. Stern hypothesized that this alternative network may be used by patients with AD to compensate the effects of dementia (Stern et al., 2004). This is compatible with the concept of neural compensation, in which patients use synaptic networks that are not used by healthy individuals to perform a task.

The criteria for neuronal compensation require that people with pathology use a synaptic network that is not used by healthy individuals, this being associated with better performance. For example, in several studies, some elderly people showed additional activation in areas contralateral to those activated by young subjects; the elderly who are more cognitively active performed better than those who were not, indicating that this was compensatory (Rosen et al., 2002).

Similarly, studies have shown that additional activation in patients with AD compared to the control group is also compensatory (Grady et al., 2003).

Based on a positron emission tomography, Scarmeas (2004) identified areas of the brain whose activation during a nonverbal memory task was correlated with a CR index calculated on the level of education and literacy (Scarmeas et al., 2004).

Such areas have been identified both in the control group and in patients with AD, suggesting that these areas may reflect the existence of CR. Interestingly, in some areas of the brain, the direction of association between CR and brain activation differed in healthy people and patients with AD. For example, some areas of the brain have shown an increase in activation as a function of the increase in RC in elderly patients and a decrease in activation in patients with AD. The results suggest that there were some compensations for the effects of dementia pathology and that CR is differently mediated in patients and the control group, given the hypothesis that individuals with a higher measured CR would activate brain circuits in a more adaptable way. Activation changes in patients with AD are compatible with the definition of neural compensation; similar

observations were observed in comparison between young subjects and older ones (Manly et al., 2005).

Imaging evidence is beginning to support the two hypothetical neural mechanisms underlying CR: neural reserve highlighting pre-existing differences in neural efficiency or capacity, and neural compensation reflecting individual differences in the ability to develop new responses and disabling compensatory effects of the pathology. .

The conclusions of studies on the influence of education in neurodegenerative pathology occurence were as follows: lifelong cognitive stimulation could contribute to increased synapse density, accelerate neurogenesis, improve the efficiency and flexibility of neural networks, thus ensuring protection of cognitive function. neuronal losses as we age and the development of neurodegenerative pathology (Stern, 2009). It has been observed that the clinical symptoms of the disease appear earlier in people with a lower level of education and later in those with a high level of professional and educational level (Evans et al., 1993; Mortel et al., 1995; Rocca et al., 2011), cognitive reserve acting as a moderator of the relationship between changes in the brain and the clinical profile of neurodegenerative pathology (Mortamais et al., 2014).

Concept

The initial concept of cognitive reserve was hypothetical and involved the quantitative determination of brain reserves, respectively the number of neurons or destroyed synapses (Yu et al., 1989). This idea is supported by studies showing that the prevalence or incidence of dementia is lower in people with a higher brain volume (Schofield et al., 1997). Research aimed at the existence of interindividual differences in cognitive aging, attribute these differences to the relationship between neurodegenerative pathology and cognitive functioning. The backup model is passive because it suggests that the brain can simply tolerate more before reaching a critical threshold that causes clinical symptoms.

This paper aims to study the link between the level of cognitive impairment, the severity of brain atrophy and the level of education of a sample of people who presented at the Memory Center between 2011 and 2016.

Objectives and hypotheses

The present study had the following objectives:
O1. The study of the relationship between the extent of cerebral atrophy and the level of cognitive disorders;

O2. The study of the relationship between the extent of cerebral atrophy and the level of education;
O3. The study of the relationship between the level of neurocognitive disorders and the level of education.

The research hypotheses under analysis were:

I1. The extent of cerebral atrophy correlates with the severity of cognitive impairment;
I2. The level of education compensates the extent of cerebral atrophy;
I3. The level of education as a central element of the cognitive reserve compensates the level of neurocognitive disorders.

Material and method

Participants

This study is based on empirical research conducted between 2011 and 2016 at the Memory Center, an outpatient service for early detection, diagnosis and treatment of neurocognitive disorders established by the Romanian Alzheimer's Society in Bucharest. The inclusion criterion in the study was the following: people who presented with cognitive complaints and had cerebral atrophy in the neuroimaging investigation. Exclusion criteria from the study: ethanol dependence, lack of neuroimaging investigation or the presence of atrophy within normal limits.

Of the 235 people included in the study, 153 were women and 81 were men aged 35-95 years. A male person with an ethanol dependence was excluded from the study. Of these, only 174 people who had neuroimaging investigations were diagnosed with neurodegenerative pathology.

Procedure

The parameters followed were: gender, age, level of education, degree of severity of cerebral atrophy, level of cognitive impairment expressed by MMSE score.

Mini-Mental State Examination (MMSE) is the tool that assesses a person's mental state by testing the following neurocognitive areas: learning and memory, language, executive functions, complex attention, social cognition, perceptual motor function, the maximum score being 30 (Folstein et al., 1975).

Neurodegenerative disorders are characterized by selective neuronal damage - which could be followed or preceded by synaptic lesions. Therefore, specific mutations and other changes in synaptic proteins can

lead to certain neurodegenerative diseases. The predominant hypothesis is that these mutations result in an increase in the production of amyloid-protein 1-42 which acts as a neurotoxin. However, amyloid precursor protein may play an important role in synaptic function and neuronal maintenance, and its abnormal activity may lead to neurodegeneration (Masliah, 1998).

Computed tomography also showed some cases of dementia without atrophy and evidence of atrophy without dementia. The lack of cerebral atrophy in a patient with dementia should lead to a search for a potentially treatable cause of dementia. Huckman analyzed the criteria for diagnosing computer tomography atrophy and concluded that, due to its non-invasive nature, it is a valuable aid in detecting patients with dementia (Huckman et al., 1975). Diagnosis involves neuroimaging investigation by computer tomography and nuclear magnetic resonance. Depending on its severity, cerebral atrophy can be: mild, moderate or severe, the parameter being called the degree of severity of cerebral atrophy.

For statistical analysis, IBM SPSS Statistics, Version 22.0 was used.

The $\chi 2$ test and Fisher's exact test were used to highlight the differences between the values of the qualitative variables and the ANOVA parametric test and the non-parametric Kruskal Wallis and median comparison tests were used to highlight the differences between the groups in terms of quantitative variables. For a multidimensional approach to variables, the generalized linear model (GLM) was used.

Results

The distribution of patients by gender was 34.62% for men (81 patients) and 65.38% for women (153 patients).

Figure 1 shows the distribution of patients according to gender and educational level. These results illustrate that the distribution of education level differs significantly depending on gender ($p = 0.002$, Fischer's exact test); specifically: 46.9% of men attending the Memory Center have higher education, while only 27.5% of women have the same level of education.

According to the study, the age distribution does not depend statistically significantly on the patients gender ($p = 0.818$ for the ANOVA test). The variables with significant effect on the MMSE score are the variables age ($p = 0.018$ for test F), level of education ($p = 0.002$ for test F), and the degree of severity of atrophy, called in the paper the degree of atrophy ($p < 0.001$ for test F). Table 2 shows the coefficients of the model after eliminating the variables with insignificant effect.

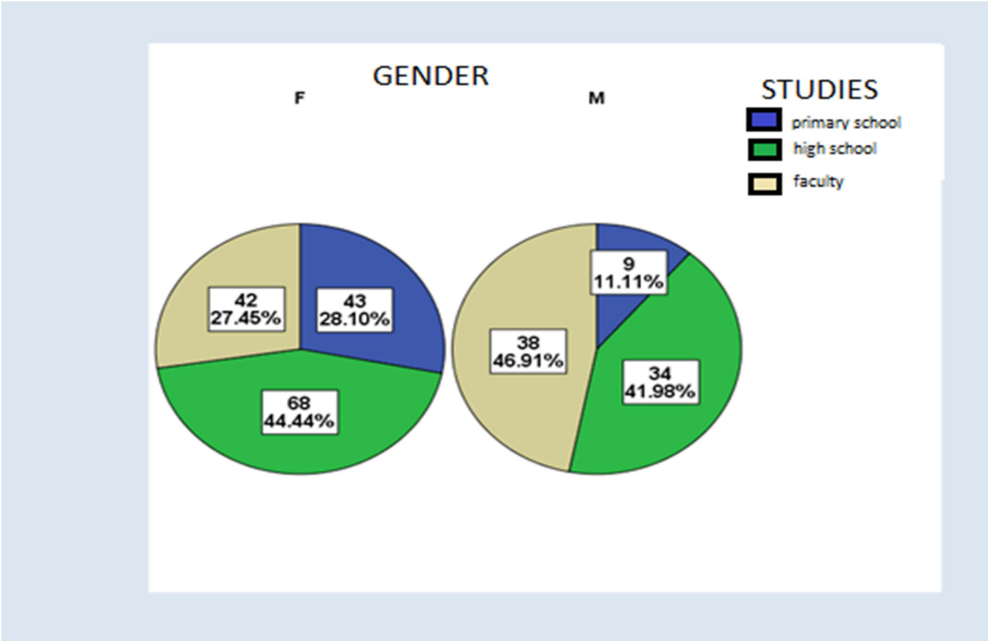

Figure 1. The distribution of patients according to gender and educational level

Table 2.
Univariate GLM analysis for the dependent variable MMSE score and independent variables: age, level of education and severity of atrophy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1508.449	4	377.112	21.026	0	0.343
Intercept	2080.878	1	2080.878	116.021	0	0.419
Age	104.962	1	104.962	5.852	0.017	0.035
Education	319.044	2	159.522	8.894	0	0.099
Severity of atrophy	789.538	1	789.538	44.021	0	0.215
Error	2887.599	161	17.935			
Total	99150	166				
Corrected Total	4396.048	165				

Table 3 shows the univariate GLM model for the MMSE dependent variable. The estimated parameters for the independent variables are age, educational level and severity of atrophy.

Table 3
Univariate GLM model for the MMSE dependent variable

Parameter	B	Std. Error	t	Sig.	95% Confidence interval		
					Lower Bound	Upper Bound	Partial Eta Squared
Intercept	30.321	2.944	10.3	0	24.507	36.134	0.397
Age	-0.093	0.038	-2,419	0.017	-0.169	-0.017	0.035
Studies=primary school	-3.747	0.914	-4.099	0	-5.552	-1.942	0.094
Studies=high school	-1.993	0.742	-2.686	0.008	-3.458	-0.527	0.043
Studies=faculty	0	.	.	.	.	.	.
Atrophy degree=mild	4.538	0.684	6.635	0	3.187	5.889	0.215
Atrophy degree =moderate	0	.	.	.	.	.	.

Figure 2 shows the severity of atrophy that does not significantly change the mean of MMSE score, as opposed to the absence of atrophy that significantly increases the mean MMSE score ($p < 0.001$ for the multiple comparison Kruskal-Wallis test).

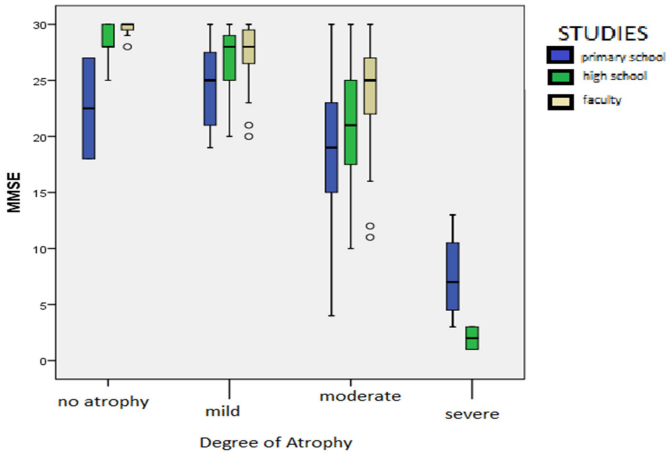

Figure 2. Distribution of MMSE score depending on the severity of atrophy and the level of education

Discussions

Following the interpretation of the results of the generalized linear model (GLM) for the MMSE-dependent variable in patients with mild or moderate atrophy severity and MMSE score> 10, the following were observed:

The severity of atrophy has a significant effect on the MMSE score ($p < 0.001$). Specifically, on average, the MMSE score is significantly higher ($p < 0.001$ for the t test) for mild severity compared to moderate severity (with 4.538 higher, in the analyzed case).

For the same age and severity of atrophy, the level of education has a significant effect on the MMSE score ($p < 0.001$, Table 4): with the level of education, the average MMSE score also increases. This confirms the hypothesis of cognitive reserve. Specifically, the average MMSE score is significantly lower ($p < 0.001$, respectively $p = 0.008$ for the t test) at the level of "primary / secondary" studies, respectively "average" compared to the level of "higher" studies (with 3.747 smaller, respectively 1.993 in the analized case).

The MMSE score decreases significantly ($p = 0.017$ for the t test) with age (on average, the decrease is 0.093 for each year of life, in the case analyzed). It should be noted that this result is important considering the 95% confidence interval mentioned in the table, 10 years of life decreases the average MMSE score by a small value: between 0.17 and 1.69.

The gender variable has an insignificant effect on the MMSE score.

Figure 3 graphically highlights the fact that, at the population level, the MMSE score tends to decrease with the increase of the severity of the atrophy and to increase with the level of education. However, at the individual level it is found that the frequency of exceptions is high: 1) In many cases the severity of brain atrophy observable by imaging has no observable cognitive consequences on the MMSE score; 2) MMSE scores are high for the category of patients with higher level of education. The level of the MMSE score shows that patients with a high MMSE score are in the early stages of the disease. The severity of cerebral atrophy is present imagistically, but the anatomical manifestations preceded the cognitive ones, which confirms the hypothesis of cognitive reserve (Huckman et al., 1975).

The highest mean MMSE scores occur in patients without brain atrophy, and the lowest mean values occur for global atrophy. The multiple comparison Kruskal-Wallis test identifies significant differences in MMSE distribution between the categories: "without cerebral atrophy" and "global cerebral atrophy" ($p < 0.001$)

For the multidimensional analysis of the variables with significant influence on the MMSE score, the following were eliminated from the sample: 1) patients with incomplete data; 2) patients with an MMSE score lower than 11 (the score lower than 11 is considered “severe” and appears only 6 times in the database); 3) patients with the degree of “severe” atrophy (considering the fact that only one cumulatively meets the conditions to be selected); 4) patients for whom the result of the neuroimaging investigation is normal, within the age limits. Under these conditions, 166 patients qualified for the multidimensional analysis and all presented a degree of severity of cerebral atrophy.

The conclusions of the analysis refer to patients who are not classified in the class of “severe” MMSE score neither in relation to the MMSE score nor in relation to the degree of atrophy.

Thus, the variables with significant effect on the MMSE score are the severity of atrophy, the level of education and age (for each variable, $p < 0.01$ for the Fischer test).

The patient's gender does not have a significant effect on the MMSE score.

On average, the MMSE score is significantly higher ($p < 0.001$ for the Fischer test) for mild atrophy compared to moderate atrophy.

The average MMSE score is significantly lower ($p < 0.001$, respectively $p = 0.008$ for the Fischer test) for the level of primary / secondary education and respectively average compared to higher education (faculty), this score decreases significantly with age ($p = 0.017$ for the t test).

The multidimensional analysis confirms the hypothesis of cognitive reserve, except for patients who are included in the “severe” class according to the classification of the MMSE score, or according to the classification of the degree of atrophy. More precisely: regardless of the degree of cerebral atrophy, the effect of a higher level of education significantly increases the MMSE score.

The multidimensional analysis performed in the paper confirms the hypothesis of cognitive reserve, except for patients who are included in the class "severe" according to the classification of the MMSE score, or according to the classification of the severity of atrophy. More precisely: regardless of the degree of cerebral atrophy, the effect of a higher level of education significantly increases the MMSE score. It should be noted that patients with a high MMSE score, who are in the early stages of the disease, have a low degree of imaging of cerebral atrophy, an anatomical manifestation of the neurodegeneration process, which confirms the hypothesis of cognitive reserve.

Data from the literature confirm the hypothesis of the study, so the clinical symptoms of the disease appear earlier in people with a lower level of education (Albert, 1995; Bennett et al., 2003) and later in those with a high level of training and professional, cognitive reserve (Evans et al., 1993; Mortel et al., 1995; Rocca et al., 2011) acting as a moderator of the relationship between changes in the brain and the clinical profile of neurodegenerative pathology (Mortamais et al., 2014).

The influence of education on the occurrence of neurocognitive disorders (Alexander et al., 1997) had the following impact: lifelong cognitive stimulation could contribute to increased synapse density, stimulate neurogenesis (Stern et al., 2000), improve the efficiency and flexibility of neuronal networks (DeCarli et al., 1992), thus ensuring a protection of cognitive functioning in the conditions of accumulation of neuronal losses as we age and of the development of neurodegenerative pathology (Stern, 2009).

Conclusions

According to the results of the present study, the more the patient is diagnosed in the early clinical stages and receives appropriate treatment, the slower the disease progresses and the better the quality of life of the patient and his family. The therapeutic approach that integrates the theory of cognitive reserve can lead to improved quality of life of patients affected by neurocognitive disorders, but also to a significant reduction in care costs, costs that affect both the family and the community and society as a whole.

The present paper aimed to study the link between the level of cognitive impairment, the severity of brain atrophy and the level of education on a sample of people with cognitive impairments who showed up at the Memory Center during 2011-2016. For some of these people, it was found that, although neuroimaging investigations showed a low degree of atrophy severity, the level of the MMSE score was high. In the case of other patients, the research showed that, although the MMSE score was low, the result of the neuroimaging investigation did not show any anatomical manifestation of the neurodegeneration process.

The interpretation of the study results confirmed the hypothesis of cognitive reserve which allows certain people to cope better with the pathology and to remain clinically intact for longer periods of time. It was observed that, as the present research showed, the clinical symptoms of the disease appeared earlier in people with a lower level of education and later in those with a high level of education, which led to the conclusion that the cognitive reserve may have acted as a moderator of the relationship between

changes in the brain and the clinical profile of neurodegenerative pathology.

Going further and starting from the conclusions of studies in the literature on the influence of education in the occurrence of neurodegenerative pathology, a pilot study was conducted on a group of patients who were integrated into a program of stimulation and cognitive training sessions organized within Memory Center. The results of this study showed that both patients and their families have registered not only an improvement in the MMSE score, but especially a better quality of life.

LIST OF ABBREVIATIONS:

ADI	Alzheimer's Disease International
AE	Alzheimer Europe
APA	American Psychiatric Association
AD	Alzheimer Disease
CRC	The reserve capacity of the brain
DSM III	Diagnostic and Statistical Manual of Mental Disorders IIIth Edition
DSM IV TR	Diagnostic and Statistical Manual of Mental Disorders IVth Edition - revised
DSM-5	Diagnostic and Statistical Manual of Mental Disorders Vth Edition
IQ	Coefficient of intelligence
NIS	National Institute of Statistics
MMSE	Mini Mental State Examination
OCDE	Organization for Economic Cooperation and Development
WHO	World Health Organization
CR	Cognitive Reserve
BPSD	Behavioral and Psychological Symptoms Caused by the Disease
NCD	Neurocognitive Disorder
EU	European Union

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Chapter 6

The pain-aggression relationship in patients with neurocognitive disorders

Victoria STAN[1]

Abstract

The presence of emotional disorders among neurodegenerative disorders are the expression of global deterioration but also of pains often encountered in elderly people. Studies show that pain is often ignored or under-treated in case of people with neurodegenerative disorders. The cross-sectional study implied researching patients with Alzheimer's disease in advanced stages of evolution and used the psychopathological research strategy that aimed to highlight the presence of aggressive manifestations correlated with the presence of pain. We analysed the relationship between the predictor variable, represented by the pain registered by the study subjects, and the criterion variable, represented by the aggressive behaviours, agitation and depression. Significant statistical correlations between pain and agitation (r = 0.49), significant correlations between pain and depression and between depression and agitation (r = 0.62) were obtained , as well as high correlations between patient's pain and the aggression he manifested (r = 0.62). These results show the importance of improving the pain assessment in patients with neurodegenerative disorders.

Keywords: *Alzheimer's disease, neurodegenerative disorders, advanced stage, emotional disorders, pain, aggression, agitation, depression*.

Alzheimer's disease is a degenerative pathology of the brain that affects cognitive function, the ability to learn, orient, calculate and judge, being associated with emotional and behavioural disorders. The forms of Alzheimer's disease are: the rare encountered form with early onset caused by genetic mutations and the common encountered form with late onset, heterogeneously determined.

Neurodegenerative disorders are progressive syndromes of global deterioration and decline compared to a previous level, known as serious pathologies, not associated with the normal aging of the individual. These represent structural and functional brain changes, presenting themselves as a major cause of disability and dependence.

Advanced stage of neurodegenerative disorders are 5-7 dementia stages (according to the Reisberg scale). The patient is depending on another person and his survival relies on

[1] Spiru Haret University
Correspondence address: Victoria Stan, Spiru Haret University, 46 G Fabricii Street, 6th District, Bucharest, Romania, Zip Code 060821, Ph.: +40-021-455-10-20; Fax +40- 021-255-60-94; E-mail: sp.stan.victoria@spiruharet.ro

others. During these stages, certain abilities are gradually impaired, such as : thinking, memorization, language, motor functions and sphincter control.

Emotional disorders in the symptomatic picture of the patient with neurodegenerative disorders are: depression, agitation, anhedonia, hypo expressiveness. Related to the loss of control, irritability, aggression and apathy appear. Agitation, dysphoria, hallucinations, apathy, aberrant motor behaviour, sleep and eating disorders are significantly correlated with cognitive disorders.

Pain is common in people past their seventies who may present multiple medical conditions. Pain in patients with neurodegenerative disorders is a complex problem that requires careful clinical evaluation. Due to cognitive and communication impairment, pain should be diagnosed with nonverbal tests and rigorous observation.

Aggression in people with neurodegenerative disorders may include verbal or physical manifestations such as threats, screams, beatings, insults, disinhibition etc. Aggressive behaviour can be a response to emotions such as: fear, frustration, humiliation, anger but also to strong stimuli, upsetting noises, heat, cold, hunger.

Agitation is often encountered in people with neurodegenerative disorders and may be caused by feelings of insecurity, frustration due to loss of abilities, fear, confusion or fatigue. Patients may become agitated due to discomfort or pain that they cannot interpret or express.

Depression can be difficult to diagnose in people with dementia because it can be confused with dementia symptoms (apathy, loss of interest in activities, social withdrawal, poor concentration, attention and thinking). Cognitive and language impairment can prevent the patient from expressing sadness and in addition the symptoms can be diffused.

Introduction

This chapter examines both the challenges and benefits of pain assessment in patients with neurodegenerative disorders and addresses the topic of the patient's emotional approach characteristics. We also want to draw attention to a very important topic in terms of neurodegenerative disorders and especially Alzheimer's disease (AD), respectively the underdiagnosis of pain in these types of patients.

Dementia is a terminal illness and patients may have other conditions that cause pain, such as the progressive deterioration of the ability to understand and communicate, that may lead to pain underdiagnosis in this patients' category. In the early stages of the disease, the patient's ability to recognize and communicate pain may be intact. In later stages of the disease, this capacity is reduced (Ferrell et al., 2014). Palliative care and psychosocial support are important in AD as well as the tools used to assess the pain of the patient in an advanced stage of the disease (Ferrell et al., 2014). Given the information available so far, AD is conceptualized as a biological and clinical continuum that includes clinically asymptomatic individuals with evidence of AD pathology, as well as the symptomatic clinical phases of AD (Jones et al., 2017). Researches shows that the accumulation of Aβ is not sufficient to produce symptoms

(Hardy & Selkoe, 2002) and that additional factors must be involved in determining neurodegeneration (Braak & Braak, 1991). Some researches show that synaptic, metabolic, neuronal, mitochondrial, inflammatory and other age-related alterations may also play a role in the pathogenesis of AD (De Strooper & Karran, 2016). It is assumed that the presence of tau pathology may lead to accumulations of Aβ and vice versa (Jones et all., 2017). Histopathological characteristics of AD include: accumulation of amyloid plaques; formation of neurofibrillary tangles of tau aggregate proteins, including hyperphosphorylated tau; neurodegeneration (neuronal loss). The diagnostic biomarkers for the AD continuum, from the preclinical phase to the clinical phase, when symptoms become evident, are: amyloidosis, tauopathy, atrophy, memory impairment and functional disorders (Jones et al., 2017, Aisen et al., 2017).

Despite efforts led to improve diagnosis, developments in the clinical care of patients with neurodegenerative disorders did not adequately progressed, and, as there is no available treatment for AD healing, more studies are needed for improving patients' quality of life.

The evidence data base for this chapter is sourced in the research undertaken by the author in two Medical and Social Care Centres in Bucharest and Dâmbovița County.

In general, pain is universally perceived as a sign of illness. Pain is an unpleasant sensation and an emotional experience that aims at the body's reaction to prevent further tissue damage - International Association for the Study of Pain (IASP, 2019). The experience and description of pain differ from one individual to another and is a defense mechanism that causes the individual to take action when there is tissue damage. When a stimulus, regardless of its type, acts on the receptors, it is generated a potential action which is transmitted to the brain (nociceptive function) where perception takes place and the reflex withdrawal reaction is triggered in front of the painful stimulus. Afterwards the brain decides what to do about the pain (IASP, 2019).

The cognitive component is designated by a series of mental processes that will influence the perception of endogenous opioid, adrenergic, gaba, serotonergic, cannabinoid pain that are involved in pain control (Manzanares et al., 2006). The behavioural component of pain consists of verbal and nonverbal manifestations, noticeable in the suffering person. Medication can help relieve pain, depending on its cause and form. People with a higher pain rate are those past their seventies, with multiple medical conditions, often neglected. These people may suffer from neuropathic or nociceptive pain (Pieper, 2011). According to IASP (2019), neuropathic pain may be due to damage to the nervous system, is difficult to

treat and may persist for a long time after the lesion heals. Nociceptive pain is that caused by the suffering of organs or tissues and diminishes while healing.

Clinical and experimental studies have shown that the elderly have an increase of the pain threshold (decreased sensitivity to mild pain) and an increase of vulnerability to persistent pain (IAGG). Impairment of nociceptive function appears to be involved here. Thus, mild pain may decrease the reporting of symptoms, while tolerance to severe pain decreases with age. The efficiency of the descending inhibitory mechanisms of pain, especially their opioid component, also appear to deteriorate with age (Tudor, 2013).

People with mild to moderate neurodegenerative disorders are able to verbally express pain, but, as cognitive functions are impaired, the assessment of pain is more difficult and is done using other types of methods.

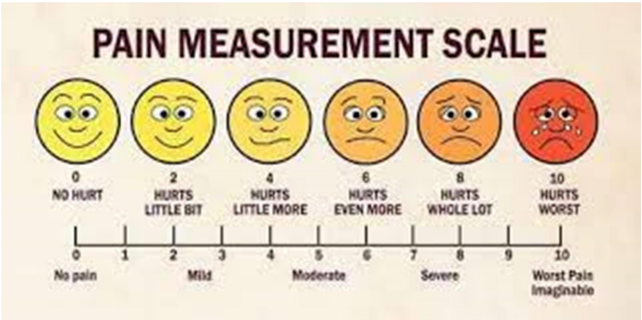

Figure. 1. Faces Pain Scale – Revised, ©2001, International Association for the Study of Pain - www.iasp-pain.org

The forms of dementia are multiple and the pain manifestations can be diverse in these patients, depending on the nature of the mental impairment.It is known that Alzheimer's dementia is characterized by a change in pain experience (Scherder & Bouma, 1997). People with advanced AD disease appear to be sequentially affected by pain, directly proportional to the moments of contact with themselves and the environment (Stan, 2019). As the disease progresses, the moments of contact with the environment decrease and the assessment of pain in these people is very difficult because there must be a rigorous permanent recording of observations on the patient's condition in order to detect pain. However, a study by Cole et al. (2006) using functional magnetic resonance imaging (MRI), presented results related to pain in people with and without Alzheimer's disease, respectively brain activity in the same regions. This

shows that people with dementia feel pain in the same way as those without dementia, which should increase the attention paid to the observation of pain signs in patients with dementia (Cole et al., 2006).

Among the most difficult neuropsychiatric symptoms in people with AD, there are aggression and agitation - threats, violent gestures, disruptive behaviours (Cohen-Mansfield & Billig, 1986). These manifestations represent the communication of discomfort, confusion, pain, fear and are an alarm signal that the person needs help. Due to impaired verbal communication, thinking and memory, expression can often take this form.

Aggression can be defined as "a set of hostile behaviours that can manifest consciously or unconsciously in order to coerce, destroy, degrade, deny or humiliate another person or self-directed - self-aggression" (Gorgos, 1987, p. 110). Among the theories on aggression are found Freud's instinctual theory that considers aggression as a manifestation of an innate drive, the tendency to want to possess the object, a tendency that biology could explain by man's need to use other means to overcome the resistance of the object ”(Freud, 1991) and Lorenz’s ethological theory of adaptive aggression,“ that instinct of the animal (and of man) to fight against individuals of its own species ”(Lorenz, 1998) . Reactivity theory considers aggressive behaviour as a reaction to frustrating, unpleasant situations (Mitrofan, 1999). The learning theory considers aggressive behaviour to be acquired through the mechanisms of learning through imitation and observation - direct learning (Skinner, 1953) or learning through observation (Bandura, 1973). On the other hand, cognitive theory emphasizes the cognitive processes inserted between the stimulus and the behavioural response of the individual (Rusu, 2007).

Approximately 50% to 80% of people with neurodegenerative disorders exhibit agitation and aggression and approximately 60% dromomania (Aalten et al., 2006; Pieper et al., 2011). The International Psychogeriatric Association groups noncognitive symptoms under the term “behavioural and psychological symptoms caused by the disease” and these include: agitation, aggression, apathy, anxiety, depression, irritability, disinhibition, delusions, etc. (International Psychogeriatric Association, 2019).

Clinical studies have highlighted the presence of often massive emotional disorders in neurodegenerative disorders (Cummings et al., 1994). These may be an expression of the global deterioration sustained by neuroimaging findings that show brain atrophy when we talk about AD. Deficiencies in visual perception and language contribute to difficulties in processing emotions and information in general. The relationship between impaired emotional decoding abilities and the level of severity of dementia

is not clearly underlined by studies, instead there are correlations between affected emotional processing and depression in patients with neurocognitive disorders (Kohler et al., 2011). Associations between emotional disorders and poor emotional processing also involve a low degree of emotion control. Cerebral amygdala atrophy has been linked to aberrant motor behaviour, anxiety, and irritability (Namiki et al., 2007). Imaging studies have shown that amygdala atrophy is comparable to that of the hippocampus in the early clinical stages of AD and there appears to be correlations with neuropsychiatric symptoms (Poulin et al., 2011). Agitation, dysphoria, hallucinations, apathy, aberrant motor behaviour, sleep and eating disorders are significantly correlated with cognitive disorders (Poulin et al., 2011).

As AD advances, the clinical phenomena experienced by the patient and observed by the caregiver, medical staff, psychologist, etc. consists of change of symptoms, mood, perception, thinking, motor activity and personality traits. These are correlated with high levels of suffering and impairment of quality of life, both in patients with dementia and in their caregivers, the financial and health costs rising accordingly (Brodaty & Donkin, 2009). The emotional disorders of AD patients are often the reasons why they end up being hospitalized in health care centres. The family is no longer able to manage the situations created and seeks specialized help. When there is only one person caring for the patient, things get even more complicated because the person with AD needs to be constantly monitored in the second stage of the disease (Stan, 2019). In addition, the patient with dementia should be monitored permanently from a medical point of view. Existing studies show that in patients with neurocognitive disorders pain is often ignored or undertreated (Scherder & Bouma, 1997).

Caregivers of patients with dementia should keep in mind that many of the causes of pain are the same for all the elderly: osteoarthritis, diseases affecting the joints and bones, muscle stiffness, etc. (Cohen-Mansfield & Billig, 1986). People with moderate or even advanced dementia may be able to provide information about their pain at that time but cannot tell if they have had pain before and cannot describe the pain. Signs of pain in a person with dementia may include: vocalizations (whistling, moaning, crying), facial expressions (straining, frowning, grimacing), changes in body posture (freezing, swaying), behavioural changes (worsened confusion, refusal to eat), elevated body temperature, increased pulse or blood pressure, sweating, redness, or physical changes in skin pallor (Cohen-Mansfield, 1986).

Manifestations of anger often occur in response to emotions such as: fear, frustration, humiliation, strong stimuli, annoying noises, heat, cold,

hunger (Huskisson, 1982). Frustration with the loss of abilities can make the patient angry, but aggressive reactions can rely on needs that he cannot be aware of or that he cannot express. Pain or hunger, the feeling of insecurity or the threat of property (space, objects) can be triggers of reactions of aggression, agitation or aberrant behaviours (Huskisson, 1982).

In people with moderate to severe dementia, agitation and aggression are common and are some of the most difficult symptoms for clinical management. Agitation and aberrant motor behaviour are correlated with the pathology of the orbitofrontal cortex (neurofibrillary tangles) in AD and neuritic plaques lead to apathy (Tekin et al., 2001). Husebo et al., (2011, p. 343) mentions that "effective pain management can play an important role in the treatment of agitation and could reduce the number of unnecessary prescriptions for psychotropic drugs in this population".

The International Psychiatric Association (IPA) mentions in the Guidelines for Behavioural and Psychological Symptoms of Dementia (BPSD) that it is important that all professionals involved in the care and treatment of patients with signs of dementia understand very well the behavioural and psychological symptoms of dementia and offer the best possible resources for the most effective treatment. These guides serve as a reference tool or training resource for dementia professionals (IPA, 2019).

The aim of the research undertaken in the field of pain is related to the understanding of the mechanisms as well as to the improvement of the pain relief protocols in people with dementia. People with early-stage dementia typically retain the ability to report pain, but people with advanced disease are no longer able to be aware of or report the pain (dementia.org). Loss of emotional and information processing abilities prevents the patient from expressing pain and there is a need to look for other signs that indicate pain. Specialists and caregivers / the family of people with advanced dementia need to be informed about the assessment of pain that requires specific methods of observing the non-verbal signs of pain and special attention.

Signs of pain may include agitation and observable behaviours, and assessment of people with dementia is difficult due to cognitive impairments and impaired memory. Some tools require knowledge, work skills and preparation for a correct assessment, others are easy to use. In the advanced stages of the disease, any change in behaviour must be assessed from the perspective of potential suffering that can take the place of communication. Experiencing discomfort or pain in people with advanced AD can take the form of agitation, aggression in various forms, body postures that are not characteristic of the individual etc.

The present research aimed to analyse the aggressive behaviours and agitation caused by pain and to study the relationship between these variables.

The theoretical objective of this chapter is to examine the influence of pain on the behaviour of AD patients and the practical objective is to inform specialists about aspects that can be easily overlooked in patients with advanced AD disease due to language and cognitive deficits.

Aggressive behaviours and agitation caused by pain and the study of the relationship between these variables and the examination of the relationships between factors that may underlie these manifestations of patients with neurocognitive disorders in advanced stages of the disease will also be analysed.

The research hypotheses aimed at the existence of a correspondence between aggressive behaviours, agitation and depression that will correlate with the level of pain of the AD patient. The level of correlation varies depending on the level of pain (the greater the patient's pain, the greater the aggression, agitation and depression).

Material and methods

Participants

The study took place between August 2016 and March 2017 in two Centres for the Elderly in Bucharest and Dâmbovița County. The research plan was presented to the Ethics Committee of the University of Bucharest and the approval on human subjects research was received.

Caregivers of potential participants were approached and a full description of the study was presented to them. Informed written consent was obtained in accordance with human research standards.

To determine the eligibility of the group of patients with AD, medical documents and interviews with candidates, medical staff and caregivers were used. People in a semicomatose state were excluded and patients in an advanced stage of the disease were selected.

The group of research participants consists of 91 people, institutionalized patients, 18 (19.8%) men and 73 (80.2%) women, aged between 68-91 years (average age = 79.57, standard deviation = 5.97) . Patients come from urban areas, 35 (38.5%), from rural areas, 56 (61.5%). Regarding the level of education, 62 (68.1%) of the patients graduated from primary / secondary school, 22 (24.2%) have secondary education, and 7 (7.7%) have higher education.

The statistical analysis methods used were: correlational analysis (Pearson correlation and Spearman correlation) between the dependent

variable and the independent variables. The cross-sectional study used the strategy of psychopathological, non-experimental research analysing the relationship between the pain recorded by the subjects participating in the study and the aggressive behaviours, agitation and depression. Statistically significant correlations were obtained between pain and agitation (r = 0.49), significant correlations between pain and depression and between depression and patient agitation (r = 0.62). Also, high correlations were obtained between the patient's pain and the aggression manifested by him (r = 0.62).

Instruments

The research tools and the procedure used were selected according to the level of mental impairment of the researched group, respectively assessment tools for people with advanced dementia. Due to brain atrophy and possible destruction of the pain message transmission pathways, patients with AD have difficulty recognizing and reporting pain. Assessment tools can guide us to the cause of the pain, its severity and thus we can make decisions that help improving the patient's condition. Moving the patient and medical or daily care can cause pain and a proper evaluation can help with the administration of painkillers before requests that may involve pain.

The stage of evolution of the neurocognitive disease was established following the application of the Reisberg scale. Thus, the neurocognitive pathology in the research group was classified between stages 4 and 6 of dementia according to the Global Dementia Scale - GDS (Springer Link) and the criteria of the Manual of Diagnosis and Statistics of Mental Disorders (DSM 5). Stages 4 and 5 were assumed to correspond to the stage of moderate neurocognitive disorder and stages 5 and 6 correspond to the stage of major neurocognitive disorder. Some of the subjects in stage 7 were eliminated due to their semi-comatose state.

Permission was required to use the scales and they were supplemented by the researcher with combined information from the caregiver interview and direct clinical observation.

The description of the scales is presented below.

Global Dementia Scale - GDS (Reisberg et al., 1982) provides an overview of the stage of cognitive impairment for those suffering from primary degenerative dementia, such as Alzheimer's disease. It is divided into 7 stages, 1-3 are pre-dementia stages. Stages 4-7 are the stages of dementia. Starting with stage 5, the individual can no longer survive without assistance. The tool provides a general idea of where the individual is in the

disease process, observing the behavioural characteristics of the patient and comparing them with GDS;

Cornell Dementia Depression Scale - CSDD (Alexopoulos et al., 1988). The purpose of the scale is to identify depressive symptoms in patients with dementia and assess combined information from the caregiver interview (20 min.) and direct observation (10 min.);

Visual Analogue Scale - VAS (Huskisson, 1982). It is an instrument with different graphic forms whose form of self-assessment on a line of 100 mm interpretation of the scores includes: no pain (0 - 4 mm), mild pain (5–44 mm), moderate pain (45–74 mm) and severe pain (75–100 mm). In patients with early-stage dementia, the self-assessment method can be used to report pain, but in the advanced stages of the disease, the pain is assessed by another person. Given the low expressive and receptive communication skills of people with advanced dementia, visual assessment models are used. The scale is used in clinical evaluation to measure the intensity or frequency of various symptoms;

Scale Pain Assessment in Advanced Dementia - PAINAD (Warden et al., 2003). This scale was developed to assess pain in people with advanced dementia. Before applying the scale, an observation period of 5 minutes is required and the interpretation of the scores includes: 1-3 = mild pain; 4-6 = moderate pain; 7-10 = severe pain;

Cohen-Mansfield Agitation Inventory - CMAI (Cohen-Mansfield, 1991). Agitation is operationally defined by Cohen-Mansfield & Billig (1986) as: Aggressive physical manifestations; Non-aggressive physical manifestations; Aggressive Verbal Manifestations; Non-aggressive verbal manifestations. The CMAI Agitation Inventory is an assessment tool used to monitor the frequency and intensity of agitation and was developed for use as a clinical tool by nurses, caregivers, social workers, and others. The CMAI scale assesses the patient's agitated behaviours in the last two weeks before administration (Cohen-Mansfield, 1991).

Neuropsychiatric Inventory - NPI (Cummings et al., 1994) aims to evaluate the psychopathology associated with the deteriorating syndrome. The evaluation consists of an interview when the clinician addresses to the patient caregiver. The approximate duration of application is 10 minutes. 10 symptoms are evaluated, each being scored according to frequency and severity: delusional ideas; hallucinations; agitation / aggression; dysphoria; anxiety; euphoria; apathy; disinhibition; irritability / lability; aberrant motor acts. Data analysis was performed using SPSS 19.

Results

In order to test the hypothesis that pain negatively influences the aggressive behaviour of people with neurocognitive disorders, the scales used were PAINAD and NPI. The PAINAD scale proved to have a good internal consistency, Cronbach's Alpha = 0.64 and NPI showed a very high internal consistency of the test (Cronbach's alpha = 0.96). The Neuropsychiatric Inventory (NPI) was completed with the help of patient caregivers, who assessed the patient's condition by scoring the frequency of symptoms of each item in the inventory on a scale ranging from 1 to 4. PAINAD evaluates five elements: respiration, negative vocalizations, facial expression, body language and comfort. The evaluation of the items is done on a scale from 0 to 2, summing up the score and being an index of triggering the treatment for the patient's pain.

From the data collected during the research, several variables were chosen that could have influenced the results of the analysis within the studies, namely: gender, level of education, environment, marital status and age. Correlational analysis (Pearson and Spearman correlation) was applied between the dependent variables and the chosen independent variables.

There is no significant correlation ($p > 0.05$) between age and the Dementia Pain Assessment Scale (PAINAD) and the Neuropsychiatric Inventory (NPI) according to the significance of the differences after Popa (2008). The correlation between the Dementia Pain Assessment Scale (PAINAD), the Neuropsychiatric Inventory (NPI) and gender, environment, studies was analysed. It was found that there are no significant correlations ($p > 0.05$).

The correlation analysis between the Dementia Pain Assessment Scale (PAINAD) and the Neuropsychiatric Inventory (NPI) indicates the existence of a high correlation ($r = 0.50$). This validates the hypothesis that pain negatively influences the aggressive behaviour of people with neurocognitive disorders.

The PAINAD and CMAI scales were used to test the hypothesis that pain negatively influences the agitated behaviour of people with neurocognitive disorders. Agitation is operationally defined by Cohen-Mansfield & Billig (1986) as: Aggressive physical manifestations; Non-aggressive physical manifestations; Aggressive Verbal Manifestations; Non-aggressive verbal manifestations. Descriptive indicators for the Dementia Pain Assessment Scale (PAINAD) and Agitation Inventory Scale (CMAI) were analysed and the correlations between age and agitation were also analysed, with negative results ($p > 0.05$). There were no significant correlations between Agitation Inventory (CMAI) and gender, environment, studies ($p > 0.05$).

There is a moderate to big correlation between the Dementia Pain Assessment Scale (PAINAD) and the Agitation Inventory (CMAI) (r = 0.49). A higher correlation was registered with non-aggressive physical behaviour (r = 52). These behaviours (aimless wandering, improper leaving of a place, general anxiety) are specific to people in advanced stage of neurocognitive disease and exacerbated by the presence of pain of various diseases suffered by the elderly in general (Table 1).

Table 1.
Correlations of the Dementia Pain Assessment Scale (PAINAD) and the Cohen-Mansfield Agitation Inventory - (CMAI) (and all subscales)

		CMAI agitation	F1 CMAI Non-aggressive physical behaviour	F2 CMAI Aggressive physical behaviour	F3 CMAI Non-aggressive verbal behaviour	F4 CMAI Aggressive verbal behaviour
PAINAD pain in dementia	Pearson correlations	.49**	.52**	.34**	.46**	.33**
	Sig. (2-tailed)	.00	.00	.001	.00	.001
	N	91	91	91	91	91
F1 CMAI Non-aggressive physical behavior	Pearson correlations	1	.81**	.87**	.81**	.84**
	Sig. (2-tailed)		.00	.00	.00	.00
	N	91	91	91	91	91
F2 CMAI Aggressive physical behavior	Pearson correlations	.81**	1	.49**	.82**	.50**
	Sig. (2-tailed)	.00		.00	.00	.00
	N	91	91	91	91	91
F3 CMAI Non-aggressive verbal behaviour	Pearson correlations	.87**	.49**	1	.54**	.82**
	Sig. (2-tailed)	.00	.00		.00	.00
	N	91	91	91	91	91
F4 CMAI Aggressive verbal behaviour	Pearson correlations	.81**	.82**	.54**	1	.43**
	Sig. (2-tailed)	.00	.00	.00		.00
	N	91	91	91	91	91

Significant correlations p <0.05 (*)
Significant correlations p <0.01 (**)

Pain moderately correlates with the subfactors Aggressive physical behaviour (r = 0.34 cu, r = 0.46 with non-aggressive verbal behaviour, r = 0.33 with aggressive verbal behaviour). These correlations are consistent with clinical observations. Patients who made up the research group suffer from advanced neurodegenerative disorders to a lesser extent, exhibiting aggressive behaviours such as: hitting, hanging, pushing, tearing or aggressive verbal behaviours such as: swearing, unintelligible sounds. As the statistical analysis shows, the non-aggressive verbal behaviour is slightly higher for the people included in the research group (0.46).

The PAINAD, CSDD and VAS scales were used to test the hypothesis that pain negatively influences the level of depression of the patient with AD. No correlations were found between age and the Inventory of Depression in Dementia, Analog Visual Scale (p> 0.05). There were no significant correlations (p> 0.05) between the Depression in Dementia Inventory (CSDD) and gender, environment, level of education. There are no significant correlations between analog visual scale (VAS) and gender, environment, studies (p> 0.05).

Table 2 shows the analysis of the correlations between the Dementia Pain Scale (PAINAD) and the Dementia Depression Scale (CSDD), the Analog Visual Scale (VAS) shows that there are statistically significant correlations between these scales. According to the obtained results, the hypothesis is confirmed that the pain negatively influences the level of depression in the patient with AD.

Table 2
Correlations between the Dementia Pain Scale (PAINAD) and the Dementia Depression Scale (CSDD), Analog Visual Scale (VAS)

		VAS Analog Visual Scale	CSDD Pain in dementia
PAINAD Pain in dementia	Pearson correlations	.90**	.88**
	Sig. (2-tailed)	.00	.00
	N	91	91
VAS Analog Visual Scale	Pearson correlations		.84**
	Sig. (2-tailed)		.00
	N		91

Significant correlations p <0.05 (*)
Significant correlations p <0.01 (**)

CSDD and CMAI scales were used to test the hypothesis that the level of depression negatively influences the agitated behaviour of the patient with AD.

High correlations were obtained between the Dementia Depression Scale (CSDD) and the Agitation Inventory (CMAI) (r = 0.62). The scale of depression in dementia (CSDD) contains items such as: anxiety, sadness, agitation, slowness, complaints, irritability, mood swings, pessimism, delirium. The high correlations between the two scales show that the level of depression negatively influences the agitated behaviour of the patient, confirming the hypothesis issued based on clinical observation.

In order to test the hypothesis that the level of depression negatively influences the aggressive behaviour of the patient with AD, the CSDD and NPI scales were used. Statistical analysis showed high correlations (r = 0.62) obtained between the Dementia Depression Scale (CSDD) and the Neuropsychiatric Inventory (NPI). These correlations validated the hypothesis that the level of depression negatively influences the aggressive behaviour of the patient with AD.

The GDS and NPI scales were used to test the hypothesis that the level of mental impairment negatively influences the level of aggression. The correlations obtained were moderate between the Global Dementia Assessment Scale (GDS) and the Neuropsychiatric Inventory (NPI) (r = 0.45). The level of correlation is explained by the fact that the study sample included people in an advanced stage of neurocognitive disease.

In order to test the hypothesis that the level of mental impairment negatively influences the level of agitation, the GDS and CMAI scales were used and moderate correlations (r = 0.41) between the Agitation Inventory (CMAI) and the Global Dementia Assessment Scale (GDS) were also obtained.

Discussions

The goals of palliative care attitudes are related to maintaining functionality, patient comfort, reducing pain, and generally increasing quality of life (Warden, 2003). Patients with AD may have different care needs and this justifies the palliative approach, especially in the terminal stage. The results show that depression is highly correlated with pain and aggressiveness and agitation are significantly correlated with pain. We point out that careful assessment of pain in patients with advanced neurodegenerative disorders can help increase the quality of life of patients and their caregivers.

Patients with AD, from the early stages of the disease, have “black outs”, states of no contact with the outside world, specific conditions and other types of dementia, the difference being that in other types of dementia there is still contact with emotion in general and with pain. The person with AD never cries with tears, from the early stages of the disease he can look at a family member who is suffering and not show empathy. Some clinical studies show that patients with AD avoid negative emotion, while being able to experience emotion with positive valence (Henry et all., 2009, Blessing et all. 2006) and there are indications that individuals with AD can keep emotional information in the implicit memory. These things make the task of assessing pain more difficult for patients with AD than for other dementias. The results of this research confirm these observations by high scores of agitation that show the manifestation of pain and emotional disorders under behavioural form.

The results of the present study are similar to the results obtained by Husebo et al., (2011) on a group of 352 patients, where they obtained significant correlations of decreased agitation by giving them a drug treatment against pain.

Husebo et al., (2011) reviewed the literature and concluded that there is a profound lack of rigorous studies on the effect of pain treatment in patients with dementia and agitation.

A protocol for assessing and treating pain in people with advanced dementia is urgently needed. Antipsychotic drugs given to people with dementia have adverse effects and improved pain management will help reduce the prescription of these drugs as well as other psychotropic drugs.

People with AD often have pain related to the muscular and skeletal system (the most common cause of pain in the elderly) and can generally have a variety of pathologies. Patients with AD may lose their ability to express pain even when it comes to chronic pain. For example: (1) A woman in an advanced stage of AD suffered a head injury (due to the specific precarious balance in such a phase of the disease) that resulted in an acute subdural hematoma. Only due to a systematic observation the pain was discovered and the patient operated in due time. The patient's pain was expressed by small murmurs with low frequency (2-4 times a day) and low intensity, otherwise they could have gone unnoticed. (2) A patient in the middle phase of the disease, with a complex pathology, with fourth-degree bedsores, constantly asked during care and changing dressings if she felt pain, kept saying that she did not feel anything. (3) A person in an advanced stage of the disease without a history of hypertension was diagnosed with a hypertensive outbreak due to the fact that he seemed sad. These examples show that people with AD may feel pain but cannot perceive or express it,

but that there are also patients who do not feel pain at all. Stan (2019) shows that in the absence of curative treatment of AD, the quality of life of patients and their families should be a priority.

People with AD who have symptoms of agitation, aggression, aimless wandering, etc., may experience pain that they cannot typically express, due to cognitive impairment. In the early stages of the disease patients are able to report pain in a typical way, but in the advanced stage of the disease, there is a need for systematic assessment and recording of patients' pain, otherwise the pain may remain unidentified due to lack of language. In patients with neurocognitive disorders, pain is often ignored or under-treated, as shown by Scherder and Bouma (1997). Stan (2019) recommends for each patient the creation of a record sheet of agitated, aggressive behaviours, etc. Listing the triggers of patients' emotional disorders helps to establish the necessary methods of intervention.

It was not surprising to ascertain that for the clinical group no correlations were obtained between age, gender, environment, studies and aggression, agitation or depression ($p > 0.05$).

It is also relevant to find out that between the pain recorded with the PAINAD scale and the aggressiveness recorded with the help of the NPI scale proved a high correlation ($r = 0.50$). Between the pain recorded with PAINAD and the agitation recorded with the CMAI scale was obtained a moderate to high correlation ($r = 0.49$). A higher correlation was found for subscales Non-aggressive physical behaviour ($r = 52$). These behaviours (aimless wandering, improper leaving of a place, general anxiety) are specific to people in the advanced stage of neurocognitive disease and are exacerbated by the presence of pain in various diseases suffered by the elderly in general. For the subscales Aggressive physical behaviour ($r = 0.34$), Non-aggressive verbal behaviour ($r = 0.46$), Aggressive verbal behaviour ($r = 0.33$) the correlations are consistent with clinical observations. Patients who made up the research group suffering from advanced neurodegenerative disorders exhibited to a lesser extent aggressive behaviours such as: hitting, hanging, pushing, tearing or aggressive verbal behaviours such as: swearing, unintelligible sounds. From the analysis of the correlations between pain recorded with the visual analog scale (VAS) and PANAID and depression recorded with CSDD, it was observed that there are significant correlations.

These findings are also consistent with other studies showing that other health problems that cause pain to people with neurodegenerative disorders can exacerbate aggressive disorders and agitation (Husebo et al., 2011). The literature has focused on the interaction between depression and pain, described by some authors as the coexistence of the two (Bair et al.,

2003). They reviewed the literature and identified studies that focused on the presence of pain in elderly patients with depression.

The main limitation of the study is the relatively small sample of patients and the different forms of dementia. Future studies could consider groups of only Alzheimer's patients to see the differences in manifestations compared to people with other dementias. More studies are needed to show the of pain-agitation and aggression relantionship in people with neurodegenerative disorders.

Conclusions

Our own clinical observations, as well as the literature, lead to the conclusion that people with AD differ from those with other types of dementia in that they do not appear to be in contact with physical pain and emotional pain (Scherder & Bouma, 1997). On the other hand, the loss of the ability of people with dementia to communicate prevented the individual from expressing their pain in a typical way. The caregiver may not recognize the pain expressed by the patient and consider it as behaviour that is due to dementia.

This study examined levels of agitation, aggression, depression, and pain in people with advanced neurocognitive disorders. High correlations have been found with a statistically high effect especially for depression. There were statistically significant correlations between pain and aggression and between pain and agitation in people with dementia.

Statistical results show that the person with dementia can suffer pain that can be expressed in the form of behavioural disorders and in the form of depression, which coincides with clinical observations. On the other hand, these manifestations can lead to drug treatment errors in the sense that psychological disorders can be caused by pain and mistreated with antidepressants or antipsychotics designed to calm the patient. People with dementia who show signs of depression, emotional and behavioural disorders may actually hide behind these pain symptoms that appear in these forms.

These findings show the need for pain assessment in people with advanced neurocognitive disorders of the disease to contribute to a higher quality of life, but also to reduce aggressive disorders and agitation that cause many problems to caregivers.

The present study also extends the existing studies (Husebo, 2011, Pieper, 2011) by the composition of the clinical group that includes people in advanced stages of neurodegenerative disease.

The use of pain assessment tools and appropriate observation of dementia stages can be important factors in the successful care and management of pain in patients with dementia.

The care of the patient with dementia must be thought from the perspective of the patient, taking into consideration all aspects related to personality, relationships, habits, professions that the individual had. In creating personalized plans, managing challenging behaviours is based on patient knowledge and attention to physical, medical, and psychosocial needs.

Solutions and recommendations

Knowledge related to pain in people with dementia is limited and there is a need for research and dissemination of information about to the treatment of this category of patients. Emotional disorders in neurodegenerative disorders can be triggered by a combination of factors, among which pain can play an important role. Persistent pain can affect brain function by worsening the symptoms of dementia and speeding up the damage.

Person-centred care involves observing the patient's behaviour to detect pain, especially in people with moderate and severe cognitive impairment. Evans-Roberts and Turnbull (2011) argue for the person-centred approach based on the conclusions that interpersonal responses can remain intact despite cognitive impairments. We would like to complete these conclusions with the observation that depending on the type of dementia, according to the results of the present study, people with advanced AD do not typically show pain in interpersonal relationships. However, our clinical observations are consistent with the results obtained by Evans-Roberts and Turnbull (2011), for example, in vascular dementia, but these observations remain open to new research to confirm these clinical observations.

Patient-centred care should consider the person's usual ways and signs of pain or discomfort. The recording of individual signs of pain, the diseases they suffer from, must be accessible to medical and care staff so that they can take them into account. Pain management should be an important part of this service in palliative care.

A patient-centred approach is essential because symptoms can be correlated or expressed in different ways (aggression, depression, or agitation). The establishment of therapeutic measures and the development of personalized plans can be in favour of preventing mental damage exacerbated by emotional and behavioural disorders, especially in the early periods of AD.

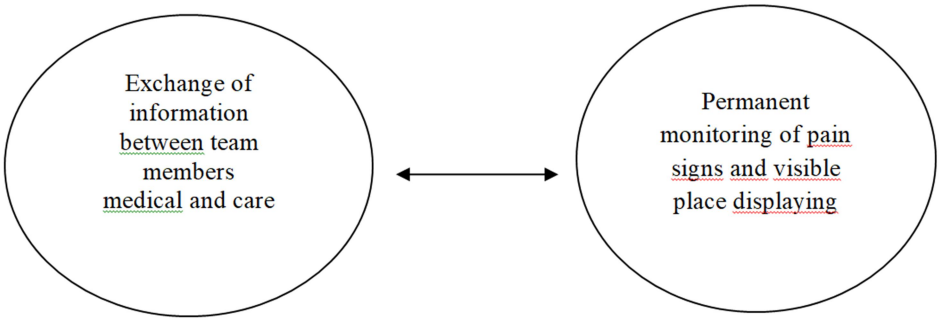

Figure 2. AD patient centred - care

Acknowledgments

I thank to the management team of the two residential centres where the study took place. This paper is part of the doctoral thesis entitled "Particularities of emotional intelligence in Alzheimer's disease" conducted at the University of Bucharest, coordinated by Mrs. prof.univ.dr. Mihaela Roco to whom I am grateful. I would also like to thank Dr. Cornelia Rada for her support.

Abbreviations

AD: Alzheimer's Disease
IASP: International Association for the Study of Pain
IPA: International Psychiatric Association
BPSD: Behavioural and psychological symptoms of dementia
CMAI: Agitation inventory
GDS: Global dementia assessment scale
NPI: Neuropsychiatric Inventory
CSDD: Depression scale in dementia
VAS: Analog visual scale
PAINAD: Pain scale in dementia
CMAI: Agitation inventory
DSM: Diagnostic and Statistical Manual of Mental Disorders
MRI: Functional magnetic resonance imaging
Aβ: Amyloid beta

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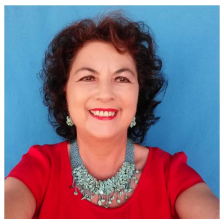
About the authors



RADA Cornelia has a Ph.D. in medicine and is Dr. Habilitat in the field of doctoral studies in Psychology. Also she is specialist supervisor in the clinical psychology specialty, psychotherapist, specializing in analytical psychotherapy, cognitive-behavioral psychotherapy and hypnotherapy autonomous practitioner.

She promotes equal opportunities and support for victims of domestic violence and human trafficking. The main scholarships and grants she has won and participated in are entitled as follows: *European standards for competitive postdoctoral training programs in advanced research, management and forensic psychiatric expertise*, *Identitary values of the contemporary Romanian family in the framework of the globalization. An anthropological approach, Socio-Psycho-Medical changes in the lifestyles of the contemporary family in Poland and Romania, Anthropological and psycho-medical coordinates of sexual-reproductive health in urban and rural population, Anthropo-demographic and socio-medical aspects in population over 60 years old.* She has published 8 books, 17 chapters in collective volumes, over 60 abstracts at international conferences, has 50 presentations at national or national conferences with international participation and published over 100 articles of which: *Sexual behaviour and sexual and reproductive health education: a cross-sectional study in Romania* (2014); *Violence against women by male partners and against children within the family: prevalence, associated factors, and intergenerational transmission in Romania:a cross-sectional study* (2014); *Alcohol consumption and accentuated personality traits among young adults in Romania: a cross-sectional study* (2016); *Latent Class Analysis Approach for the Family Adaptability and Cohesion Evaluation Scale IV Among Young People From Romania: The First Step for Validation* (2017); *Aging and intergenerational care* (2018); *Gender differences in sexual and reproductive health education in the family: a mixed methods study on Romanian young people* (2019), *Factors Associated with Depression in Middle-Aged and Elderly People in Romania* (2020).

MARINESCU Valentina is Professor Habilitat at the Department of Sociology within the Faculty of Sociology and Social Work, University of Bucharest, Romania. She teaches metods of research in communication sciences, introduction in communication and sociology of mass media both at the BA and MA level. Her main research interests are: communication and media studies in Eastern Europe, with a special focus on Romania.

Her recent publications were: Marinescu, V., Balica E. (eds.) *Migration and Crime: realities and media representations*, Palgrave (2018); Marinescu, V., Mitu, B. (eds.) *The Power of the Media in Health Communication*, Routledge (2016); Marinescu, V., Mitu, B. (eds.) *Health and the Media: Essays on the Effects of Mass Communication*, McFarland (2016)."

MITRACHE Georgeta is a teacher at the National University of Physical Education and Sports, Bucharest, Romania since 1995, currently being an associate professor in the Training Department for Teaching Personnel. Regarding recent activity, she teaches a series of disciplines, such as: "Psychopedagogy" and "Sports Psychology" (Cycle I - Bachelor studies), "Psychodiagnostics and psycho-therapy" (Cycle II - Motor and Somatic-Functional Recovery - Rehabilitation Master's programmes), currently being responsible the "Psychopedagogy" course.

She is the coordinator of the Psychology and psychomotricity Laboratory and responsible for the "*Counseling, evaluation and personal development*" program within the Career Counseling and Guidance Center of the National University of Physical Education and Sports. The main fields of interest are psychopedagogy, sports psychology, educational psychology and age psychology and psychomotor therapy. Recent works include: „*Sinteze de psihopedagogie. Învăţarea şi subsistemul cognitiv. Ediţie bilingvă română - franceză*" (Synthesis of psychopedagogy. Learning and the cognitive subsystem. Bilingual edition Romanian - French), Discobolul (2018) (Co-author with Tüdös Ștefan and Predoiu Radu); "*Incursiune în psihologia educaţiei. Profesorul de succes şi exigenţele contemporane*" (Incursion in the psychology of education. Successful teacher facing contemporary requirements), Discobolul (2018) (Co-author with Tüdös Ștefan and Predoiu Radu); "*Psihopedagogie. Curs în tehnologia*

IFR, Ediţie revizuită" (Psychopedagogy. Course in IFR technology. Revised edition), Discobolul (2016) (Co-author with Predoiu Radu).

TÜDÖS Stefan is a consulting professor within the Doctoral School of National University of Physical Education and Sport, Bucharest. The main areas of interest are sports psychology, clinical psychology, experiential psychotherapy, sports science. Former professional sportsman in the national basketball division (between 1961-1965), he has a double degree in Physical Education and Sport (1968) and Psychology (1973) and a Ph.D. in Psychology (2000).

His works show a rich teaching experience within the National University of Physical Education and Sport, Bucharest (from 1973 until now). He was also a sports psychologist within several national, Olympic and club teams. His recent works are : "*Mijloace psihologice în amplificarea performanţei sportive*" (Psychological means in amplifying sports performance), Discobolul (2019) (Co-author with Mitrache Georgeta); "*Sinteze de psihopedagogie. Învăţarea şi subsistemul cognitiv. Ediţie bilingvă (română - franceză)*" (*Syntheses of psychopedagogy. Learning and the cognitive subsystem.Bilingual edition Romanian - French*) ", Discobolul (2018) (Co-author with Mitrache Georgeta and Predoiu Radu); "*Incursiune în psihologia educaţiei. Profesorul de succes şi exigenţele contemporane* (Incursion in the psychology of education. Successful teacher and contemporary requirements)", Discobolul (2018) (Co-author with Mitrache Georgeta and Predoiu Radu).

BERCEANU Denisa is a Ph.D. student in Psychology and Assistant Professor at the Faculty of Psychology and Educational Sciences, University of Bucharest, where she teaches Learning Psychology and Managerial Psychology for BA level (2nd and 3rd years of study). Denisa has a long-standing interest in psychology, human mind, and behavior. Her main research interests are mental health, neuroscience, consumer psychology and gerontology.

She is also a Research Specialist in Consumer Neuroscience at *Buyer Brain*, a neuromarketing and consumer neuroscience company, headquartered in London, UK. Currently, her work at this company is

mainly focused on researching mental health during the COVID-19 pandemic for both employees and general population. This project, developed inside the company, was one of the winners in the EU vs Virus Hackathon, a competition organized by the European Commission in order to connect civil society, innovators, partners and investors across Europe in order to develop innovative solutions related to COVID-19. Driven by a strong desire to bring scientific solutions to life, she is also pursuing a Ph.D. in Psychology with her thesis focused on Ageism and Mental Health. Denisa is also an Assistant Editor at *Studia Doctoralia Psychology and Educational Science*, the official journal of the Doctoral School of Psychology and Education Sciences, University of Bucharest, Romania that is published by the Doctoral Centre for Interdisciplinary Research, Innovation and Sustainable Development (CCIIDD), where she works along with the editorial team to bring evidence-based studies closer to people. Along the years, she was part of and coordinated different research, advertising, and web development projects for clients from different industries.

MOGLAN Maria, the Vice President of Romanian Alzheimer Society, is a clinical psychologist and psychotherapist with a Bachelor's degree in psychology and one in engineering and a lot of active participation in European projects as manager, researcher and clinical psychologist. With a Master's degree in marketing and communication, one in environmental law and one in clinical psychology and therapeutic interventions, certified supervisor and trainer, she finished her doctoral studies in Psychology at the University of Bucharest with a thesis about the typology of emotional manifestations in neurodegenerative pathology especially in frontotemporal dementia.

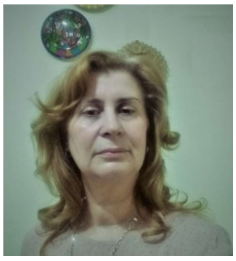
Her interest in neuropsychology and neurodegenerative disorders was materialized in the study on cognitive reserve with important results in the field of neuroscience in Romania, being most likely the only one of its kind in the country.

BOSCAIU Voicu is a graduate of the Faculty of Mathematics of Bucharest with a Ph.D. in Mathematics (1991). He is a senior researcher at *Gheorghe Mihoc–Caius Iacob* Institute of Mathematical Statistics and Applied Mathematics of the Romanian Academy (ISMMA), with around 75 published papers in statistics,

biostatistics, bioinformatics, sampling theory, econometrics, data analysis. He is the responsible for ISMMA in the research project: "*Modeling and evaluating of national and international direct investment impact on labor market and macroeconomic evolution in Romania*", granted by a PN2 program of the Ministry of Economy.

TUDOSE Cătălina is a professor in Psychiatry and Chair of Psychiatry, Department of Neurology, Neurosurgery and Psychiatry, *Carol Davila* University of Medicine and Pharmacy, Bucharest. Author of many psychiatry books and studies and of more than 100 scientific articles and papers communicated and published in professional magazines.

Co-author of the *Romanian Guide for the Diagnostic and Treatment of Dementia*, editor-in-chief of the psychiatric journal *Psihiatru.ro*, Founder member of the Romanian Psychiatric Association, founder member of the *Romanian Psychiatric Association*, founder member of the *Romanian Mental Health League*, founder member of the *Romanian Psychoanalysis Society*, President and founder of the *Romanian Alzheimer Society*, founder of the first *Memory Clinic* in Romania, she has changed the general mentality about the cognitive disorders by encouraging their recognition in early stages of diseases, Board *m*ember of the *Romanian Association of Psychiatry and Psychotherapy*, Senior Vice-President of the *Romanian Society of Psycho-Neuroendocrinology*, Knight of the *National Order of Faithful Service*, member in *European Groups of Experts in Old Age Psychiatry and in the field of Dementia*, responsible for the development of the educational programs, research, and health policies (WHO, EPA, JPND, ELTECA, ALCOVE). She is also member of the Editorial Board of the *Romanian Journal of Psychiatry* and *Romanian Journal of Gerontology and Geriatrics* and President of the Romanian Association of Psychiatry and Psychotherapy. Her areas of interest include psychopathology and psychopharmacology, old age psychiatry, community care, proved by the important number of studies, research grants and multicentric trials she has performed.



STAN Victoria has a Ph.D. in Psychology and she conducts research in the field of neurocognitive disorders. She is a clinical expert psychologist and supervisor, a psychotherapist specializing in psycho-analytic guidance with over ten years of experience. She is a teacher at the Faculty of Psychology and Director of

the *Career Counseling and Guidance Center* of Spiru Haret University. She has collaborations in which she practices adult, child and elderly psychotherapy.

Her research focuses mainly on the study of neurodegenerative disorders and patient-centered care. Recent publications include the articles "Quality of Life for People with Alzheimer's Disease and Caregivers" and "Reducing Emotional Manifestations in Alzheimer's Disease" in the *Journal of Psychology* (2019).