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SAFETY ASPECTS IN DEVELOPING NEW TECHNOLOGIES FOR REMINISCENCE THERAPY: INSIGHTS FROM THE SENSE-GARDEN PROJECT

Ileana ***Ciobanu***[1]*, Andreea Georgiana* ***Marin***[1]*, Rozeta* ***Drăghici***[1]*, Gemma* ***Goodall***[2]*, Iulian* ***Anghelache***[3]*, Cătălina* ***Anghelache-Tutulan***[3]*, Rita* ***Valadas***[4]*, Cristina* ***Vaz de Almeida***[4]*, Ronny* ***Broekx***[5]*, Jon* ***Sørgaard***[2]*, Artur* ***Serrano***[2,6]*, Mihai* ***Berteanu***[1]
AAL SENSE-GARDEN Project (https://sense-garden.eu)

[1]Rehabilitation Medicine Department, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania, [2]Faculty of Medicine and Health Sciences, NTNU/Norwegian University of Science and Technology, [3]Compexin S.A., Ploiesti, Romania, [4]Santa Casa da Misericordia de Lisboa, Portugal, [5]Epoint, Belgium, [6]Norwegian Centre for eHealth Research

Corresponding author: Ileana Ciobanu, ileanacuk@yahoo.co.uk

Abstract. Technology is present in all aspects of our life today. In order to ensure increased acceptance and usability for new technologies, a user-centred approach is promoted in regards to design and development. When the primary users of the new technology are people facing cognitive challenges, specific aspects must be addressed in order to provide a safe experience in using the new device, system or method. The project by which we exemplify these aspects is "SENSE-GARDEN: Virtual and memory adaptable spaces creating stimuli for the senses in ageing people with dementia". The aim of this project is to create multisensory spaces, virtual and automatically adaptable to personal memories. The project team has developed a new IT-based technology and a new intervention methodology for personalised reminiscence therapy and multisensory stimulation for person with dementia. In order to ensure the safety of the participants in the project trials, as well as the safety of the future users of the new technology developed in the SENSE-GARDEN project, the authors conducted bibliographic research and hereby present some aspects one needs to take into account when developing advanced technologies for reminiscence therapy for people with dementia.
Key words: dementia, reminiscence therapy, multisensory stimulation, safety

Rezumat. Tehnologia este prezentă astăzi în toate aspectele existenței noastre. Pentru a asigura un nivel ridicat de acceptare și utilizabilitate pentru noile tehnologii, se promovează centrarea pe utilizator în ce privește proiectarea și dezvoltarea acestora. Când utilizatorii primari ai noii tehnologii sunt persoane cu afectare cognitivă, este necesar să se ia în calcul aspecte specifice pentru a oferi o experiență sigură în utilizarea noului dispozitiv, sistem sau metodă. Proiectul cu care exemplificăm aceste aspecte, „Spații virtuale adaptabile la amintirile utilizatorilor, pentru stimularea senzorială a persoanelor vârstnice cu demență" – SENSE-GARDEN are ca scop crearea de spații multisenzoriale, virtuale și automat adaptabile la amintirile personale. Echipa de proiect dezvoltă un sistem nou bazat pe tehnologia informației, precum și o nouă metodologie de aplicare pentru terapia prin reamintire și stimulare multisenzorială personalizată pentru persoana cu tulburare neurocognitivă. Pentru siguranța participanților la studii pe durata proiectului, ca și pentru siguranța viitorilor utilizatori ai sistemului, autorii au desfășurat o cercetare bibliografică și prezintă în această lucrare aspectele care trebuie luate în considerație la crearea de noi tehnologii destinate terapiei prin reamintire pentru persoanele cu tulburări neurocognitive.
Cuvinte cheie: tulburări neurocognitive, terapie prin reamintire, stimulare multisenzorială, siguranță

INTRODUCTION

Technology is present in all aspects of our life today. In order to ensure increased acceptance and usability for new technologies, a user-centred approach is promoted in regards to design and development. This approach implies the involvement of the potential future users with the new technology, in different stages of its development. When the primary users of the new technology are people facing cognitive challenges, specific aspects must be addressed in order to provide a safe experience in using the new device, system or method.

The aim of the project "Virtual and memory adaptable spaces creating stimuli for the senses in ageing people with dementia" - SENSE-GARDEN is to create multisensory spaces, virtual and automatically adaptable to personal memories. The project team has

developed a new IT-based technology and a new intervention methodology for personalised reminiscence therapy and multisensory stimulation for people with dementia. SENSE-GARDEN is developed with the scope of improving the well-being and the quality of life of its users and allows the informal and professional caregivers to better relate to and support their care receivers, being either loved ones or patients.

The SENSE-GARDEN project is built on 3 conceptual drives: 1) providing evidence-based, safe and efficient therapeutic interventions for persons with dementia, in 2) a user centred design, based on 3) evidence-based safe research and development methodology.

SAFETY OF DEVELOPMENT PROCESS

Process safety during the development of the SENSE-GARDEN kit (development activities and end-user studies) will be provided through intricated management mechanisms provided from the original proposal of the SENSE-GARDEN project.

Trials need an evidence-based protocol [1], standardised and validated evaluation tools and the approval of the institutional ethical committees and commissions. All participants in the trials are correctly and completely informed about the implications of their participation to the studies, and informed consents are signed and exit strategies are prepared.

SAFETY OF SENSE-GARDEN EXPERIENCE

Safety of the user experience during the visit in SENSE-GARDEN is ensured through a set of specific measures regarding:

1. Person with dementia (PwD) risk factors – prevention, early identification, and real time management of dementia risk factors must be assessed [2] in addition to ensuring the reduction of environmental factors affecting mood, disturbing cognitive functioning and generating or exacerbating challenging behaviour. Such factors may include overcrowding, lack of privacy, lack of activities, inadequate staff attention, poor communication, and conflicts between staff and careers [3]. The cognitive, emotional and procedural content will be personalised and the parameters of exposure to the different physical aspects of the intervention (soundscape and music intensity and complexity, intensity, brightness and colours of the visual content, the ambiental lights, the intensity of the scents, the intensity and complexity of the physical activity) will be set in accord with the sensory profile of the user, with the final goal being to improve the quality of the user's life [4]. The reaction of the user will be continuously monitored and the content and the parameters will be adapted in accord. Due to the specific user profile, presenting with frailty syndrome as well as with sensory and cognitive deficits, all devices must be secured and all wires and cables put in positions to reduce the risk of incidents and accidents as well as risk of inappropriate use. The primary user must be always accompanied by the professional caregiver delivering the SENSE-GARDEN intervention.

2. Staff resources - All personnel (formal caregivers), involved in the facilitation of the SENSE-GARDEN sessions need clinical experience in working with people with neurocognitive disorders and is recommended to be certified in dementia care, in reminiscence therapy and multisensory stimulation and in what concerns the rights of people with dementia, with respect to the international guidelines [4]. The roles, attributes and responsibilities of each team member will be clearly established and respected. A special attention will be given to the training of the caregivers implementing the SENSE-GARDEN interventions, in accord with the training requirements and using the training materials prepared by the developers. A SENSE-GARDEN kit user training manual has been developed in this respect.

3. Ambiental safety – Minimal space requirements for optimal sensory-motor and cognitive experience are to be decided and respected. Ambiental safety aspects will be considered by respecting the international guidelines and national related legislation, in

order to create the appropriate environment for a safe and efficient experience for the users with dementia and their caregivers, during the trials, as well as for a SENSE-GARDEN kit installation and use requirements guide. Considering the safety of SENSE-GARDEN experience, special attention will be given to:

a) fall prevention interventions [5] and over-stimulation prevention, as well as the stress management of caregivers, as described in Dementia Care Practice Recommendations for Professionals Working in a Home Setting given by the Alzheimer's Association [6];

b) occupational protection measures working with people with dementia, related to caregiver stress and hazard [7];

c) occupational protection measures working with electric and electronic devices and with wireless transmissions [8];

d) safety measures regarding the environmental design [9]: space requirements, microclimate, infrastructure, access and furniture. As NICE guidelines for dementia care CG42 states: "Specific, but not exclusive, attention should be paid to: lighting, colour schemes, floor coverings, assistive technology, signage, garden design, and the access to and safety of the external environment" [10]. Signaling can be used to secure the flow of the SENSE-GARDEN experience. A sign at the outside of the Sense-Garden will show personnel and other people passing by that a session is going on. This will ensure that others respect the privacy of the session and will not accidentally interrupt the SENSE-GARDEN experience. With the sign in ON position we secure the privacy, lack of session interruption but also reduce the outside noise when people are passing by the SENSE-GARDEN. The SENSE-GARDEN team will take into consideration the requirements regarding the space destined for PwD in order to respect the point 1.1.10.2 of NICE Clinical Guide for Dementia recommending that "When organising and/or purchasing living arrangements and/or care home placements for people with dementia, health and social care managers should ensure that built environments are enabling and aid orientation. Specific, but not exclusive, attention should be paid to: lighting, colour schemes, floor coverings, assistive technology, signage, garden design, and the access to and safety of the external environment" [11].

The partners in the project consider in this aspect the European and national laws and regulations regarding safety and health at work, periodical check control of medical devices (even if SENSE-GARDEN kit is not a medical device, it is used in healthcare environment and as a therapy tool), mental health and the protection of people with mental disorders.

DATA SAFETY

The SENSE-GARDEN User profile is the main component for the personalization of the SENSE-GARDEN technology. Each user has her/his own profile in the system. This integrates personal data, such age, gender, place of birth, places of work, etc.; individual preferences, such singers, melodies, type of music, places, sport, food, etc. The user profile will observe national Data Protection Acts and the EU Data Protection Reform (2012) [12]. For security reasons, no personally identifiable data will be stored in the cloud, meaning that all data will be de-identified, with only codes being used. The connection between codes and real names will be done locally, using a smart wristband or card.

In the SENSE-GARDEN, the concept of "digitecture", where digital technology creates a perception of architectural constructs, is used to offer an experience that is far beyond the 'normal physical' perception of a room. Projections, combined with adaptive lighting, sound and scent, can create environments that may inspire and activate the user in a completely new way. This experience is used to give SENSE-GARDEN a whole new scope of possibilities to reconnect people with dementia to the reality around.

The EU General Data Protection Regulation (GDPR), considered the most important change in data privacy regulation in 20 years, will be respected. Attention will be paid to

personal data recording and processing (in denominated and not-identifiable manner, on-site storage devices), personal data accessibility (access allowed only for the researchers involved in SENSE-GARDEN project studies and only for precise research objectives and data analysis procedures), private data transfers (in denominated encrypted manner, only when onsite analysis is not feasible).

The team will comply with the international and national regulations regarding the confidentiality of personal data and the right to private life of the end-users and with the national regulations regarding the implementing measures for the Regulation (EU) 2016/679 of European Parliament and Council from 27 April 2016 regarding protection of individuals with regard to personal data processing and the free movement of such data.

PRODUCT SAFETY

It is of the utmost importance that the SENSE-GARDEN is a safe environment and offers a safe therapeutic intervention for all users involved. Furthermore, given the novelty of the intervention, a thorough assessment of the possible risks and complications of the products involved is required. Innovation in the project is built on already approved and certified marketed technology: scent delivery systems, high definition large screens for a sense of immersion in the created space, several speakers distributed in the space to provide surround sound, stationary bicycles coupled to screens showing road videos. These devices are mechanically, radiatively, biologically and chemically safe, as well as ergonomic.

SENSE-GARDEN applies wireless communication technologies such as WiFi, RFID, WLAN. It will use well established standards, such as IEEE 802.11n for WiFi, Low Voltage directive (LVD) 73/23/EEC for wearable devices, ECP global Gen2 (ISO 18000-6C) UHF for RFID, OSGi for web services, MIDPI 2.0 or more for mobile devices s/w, OWL and FIPA, etc. It follows all recommendations and standards created within the following groups: "Personal Connected Health Alliance (PCHA)" formed by Continua, mHealth Summit and HIMSS, "AEGIS Open Accessibility Everywhere Group – OAEG" (on ICT services accessibility). The project will strive to use free software principles as advocated by the Free Software Foundation (FSF).

The Radio Equipment Directive (2014/ 53/EU) establishes a regulatory framework for placing radio equipment on the market. It has been applicable since 13 June 2016. The Radio Equipment Directive (2014/53/ EU) ensures a Single Market for radio equipment by setting essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It applies to all products using the radio frequency spectrum [13].

This directive is to be followed, along with the European standards regarding Electro-magnetic compatibility of multimedia equipment - Immunity requirements [14], Product standard to demonstrate the compliance of wireless communication devices with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 30 MHz to 6 GHz: hand-held and body mounted devices in close proximity to the human body [15], Product standard to demonstrate the compliance of base station equipment with radiofrequency electromagnetic field exposure limits (110 MHz - 100 GHz), when placed on the market [16], Product standard to demonstrate the compliance of wireless communication devices, with the basic restrictions and exposure limit values related to human exposure to electromagnetic fields in the frequency range from 300 MHz to 6 GHz: standards regarding short-range devices [17].

PwD, caregivers and research team members' exposure to technology during SENSE-GARDEN equipment testing will comply with the international recommendations regarding exposure limits as well as to the related national laws.

SENSE-GARDEN considers the recom-mendations of the International Commission

on Non-Ionizing Radiation Protection, regarding the Thresholds of thermal damage [18], Guidelines on induced electric fields [19], Guidelines regarding exposure to visible and infrared optic radiation [20], Guidelines for Limiting Exposure to Time-Varying Electric and Magnetic Fields [21] .

BACK-UP SOLUTIONS FOR UNEXPECTED EFFECTS OF REMINISCENCE

The authors of a review concerning the ethics in reminiscence therapy state that those developing technology for reminiscence therapy must also be aware of the side effects that reminiscing may have on participants [22]. However, a recent Cochrane systematic review on reminiscence therapy for people with dementia, published in 2018, found no evidence that the therapeutic approach would have any adverse effects [23].

The investigators (researchers) in the studies involving people with dementia will be supported by a medical team consisting of a Rehabilitation Medicine Physician, a Psychologist and Psychiatrist, a Neurologist, and a Cardiologist.

In order to avoid and reduce any adverse effects of the intervention during the studies, a comprehensive list of exclusion criteria was developed and the intervention stimuli are selected through close collaboration with the family and friends of the primary users, as well as with the formal caregivers managing the case. Reevaluations and follow-up assessments of cognitive and emotional status, as well as of functionality and of participative capacities, will be performed.

In the case of any adverse events, the session may be terminated by the accompanying caregiver. It is important that, at all times, the institution is prepared to tackle such events with a back-up solution. This will involve, as a first step, referring the participant to the back-up medical team for physiological parameter stabilization and life-threatening conditions solution. The second step will be referring the end-user to the psychologist/ psychiatrist, for diagnosis and appropriated therapy and counselling.

CONCLUSION

To conclude, this paper has provided an overview of numerous aspects that need to be considered with regards to the safety of users in the SENSE-GARDEN intervention. These include process safety, data safety, product safety, and back-up solutions in the case of adverse events. Other projects or studies aiming to develop new technologies for reminiscence therapy or other psychosocial interventions should also conduct a thorough assessment of the risks and complications that their technology may have.

Careful considerations of all these aspects, along with direct input from end-users, can help to develop a safe, secure and comfortable environment for intervention.

The inclusion of users' perspectives in the design process is of crucial importance. However, after the process of designing and implementing the technology, the users also have the final say to whether the technology is functioning, useful, desirable, or safe: it is the users themselves that in the end have the defining powers.

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Conflicts of interest

The authors declare no conflicts of interest.

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CLINICAL PARTICULARITIES OF DEPRESSION IN GERIATRIC PATIENTS

*Traian **Purnichi**[1], Maria **Banu**[1], Luciana **Mardirosevici**[1], Elena Mihaela **Mihu**[1]*

[1] *''Ana Aslan'' National Institute of Gerontology and Geriatrics, Bucharest, Romania*

Corresponding author: Traian Purnichi, purnichi.traian@ana-aslan.ro

Abstract. The major depressive disorder (MDD) is the most common affliction of the elderly persons. Its presence, reduces the life quality, adds disability to the other comorbidities, decrease response to treatment for the somatic diseases, it complicates the course of dementia and it becomes a risk factor for them. Having just a few persistent symptoms with low functionality and low life quality can be by itself a risk factor for MDD or mild cognitive impairment (MCI). Subsyndromal MDD or dysthymia is more frequent in older persons. Typical presentation of the elderly with MDD also can contain insomnia, late onset of alcohol abuse, memory deficits, unexplained pain, deliberately minor self-harm, loneliness, exacerbated anxiety with somatizations, accentuation of the abnormal personality traits or behavioral disorders. So MDD with no sadness and other atypical features can obscure the diagnosis. From the clinical subtypes of MDD, the psychotic depression is likely more present. The classical delusions are worthlessness, poverty, guilt or hypochondriacal delusions. Elderly rarely fake suicide in order to attract attention or by accident. 25% of the people with MCI have significant depressive symptoms and 50% of the people with Alzheimer have depressive symptoms. MDD may appear after stroke that affect certain areas like those closer to the anterior pole of the left hemisphere, but not all agree to that. We suggest that using a scale like Stroke Aphasic Depression Questioner Hospital Version may be helpful in these cases. When we choose a treatment for MDD elderly we must consider the comorbidities, the current medication, clinical form, patient needs and to start with lower doses. In all these cases, only a multidisciplinary approach can lead to the best course of treatment.
Key words: depression, elderly, comorbidities, clinical particularities, treatment

Rezumat. Tulburarea depresivă majoră (TDM) este de departe cea mai frecventă afecțiune a vârstnicilor. Reduce calitatea vieții, adaugă dizabilitate celorlalte comorbidități și un răspuns mai slab la tratamentul bolilor somatice, complică cursul demenței și devine un factor de risc pentru acestea. Prezența doar a câtorva simptome persistente cu funcționalitate scăzută sau calitatea vieții scăzută poate fi de la sine un factor de risc pentru TDM sau deficitul cognitiv (MCI). Depresia sub-sindromală sau distimia este mai frecventă în prezentare geriatrică. Caracteristicile clinice tipice la vârstnicii cu MDD pot include și: insomnie, debut tardiv al abuzului de alcool, deficite de memorie, durere inexplicabilă, auto-vătămare deliberată, singurătate, exacerbarea anxietății cu somatizări, accentuarea anormală, trăsături de personalitate accentuate sau tulburări comportamentale. Deci, MDD fără tristețe cât și alte caracteristici atipice pot ascunde diagnosticul. Dintre subtipurile clinice ale MDD, depresia psihotică este probabil mai prezentă. Ideile delirante ale vârstnicilor pot include lipsa de valoare, sărăcia sau vina, dar în principal ei au ideație hipocondriacă. Tentativa de suicid a pacientului geriatric rar are ca scop atragerea atenției. 25% din persoanele cu MCI au simptome depresive semnificative, iar 50% dintre persoanele cu demență Alzheimer au unele simptome depresive. MDD poate apărea după accident vascular cerebral care afectează anumite zone precum cele mai apropiate de polul anterior al emisferei stângi, dar nu toți medicii sunt de acord cu aceasta. În aceste cazuri vă sugerăm să utilizați o scală similară cu Stroke Aphasic Depression Questioner Hospital Version. Atunci când alegem un tratament pentru vârstnicii cu MDD, trebuie să luăm în considerare comorbiditățile, medicația curentă, forma clinică, nevoile pacienților și să începem cu doze mai mici. În toate aceste cazuri, numai abordarea multidisciplinară poate duce la cel mai bună evoluție a pacientului.
Cuvinte cheie: depresie, vârstnic, comorbidități, particularități clinice, tratament

INTRODUCTION

The need for this article appeared after discussions with various caregivers in our institute, due to the fact that a geriatric patient has in general more comorbidities and we tend to consider its depression as a result of the ageing process or a consequence of his psycho-traumas or physical diseases. Sometimes it is the case, but it was proved that the late life depression is not just a mental disorder that affects an undifferentiated group or subgroup of age arising from senility or just getting old. It seems that besides the

different disorder prognoses, comorbidities, particularities and clinical aspects the depression at old age needs special attentions and approaches. Although dementia and mild cognitive impairment (MCI) are regarded as the main psychiatric afflictions at old age, major depressive disorder (MDD) is by far the most common [1]. Regarding the MDD clinical aspects the findings have been inconsistent, but majority opinion holds that depression (especially 'subsyndromal') is more common in old age. There may be two peaks in the prevalence rate of major depression, one in late old age and the other in middle age or earlier [1]. Consistent with the international published data, a study on Romanian patients, confirms the peaks of depression are in the middle age and at old age. Also, more women than men are affected by depression (ratio of 2:1.2) [2].

MDD in old patient is often overlooked but it is a serious disorder because it reduces the life quality, adds disability to the other comorbidities, decreased response to treatment for the somatic diseases, it complicates the course of dementia or MCI and it becomes a risk factor for them [3]. A study on Romanian patients showed that the recently diagnosed (<3 months) and treated have presented a significant improvement after ten weeks of treatment compared with the patients diagnosed with depression more than one year ago. Also, the patients above 65 years, diagnosed with depression for more than one year, had a slow improvement during all the visits. These two observations sustain the importance of recognizing depression and the initiation of the treatment from the beginning, which allow a good improvement of the functionality [4]. Many healthcare providers are tempted to presume that older people are more susceptible to MDD because of their end of life is approaching or because of their somatic chronic illnesses. So, it is a trap to 'normalize' MDD in older people with chronic illnesses because you can overlook it. The fact is that many older people are living content with their quality life, and this is improving constantly with age [3]. In the group that became depressed, the medical and psychological intervention may help significantly [3].

The objective of this article is to provide a resource to the healthcare providers that are involved in the geriatric patients care by summarizing the core knowledge from the most relevant evidence-based literature.

DIAGNOSIS CRITERIA

Depression can be a symptom or a syndrome. If we refer it as a symptom, the key in order to distinguish from a transitory low mood is a qualitative and persistent (most days, most of the time) change of the mood. Also, in depression the mood is worst during mornings, it improves during noon and afternoon and again it became worst in the evenings. In the recent years, we significantly change the way we conceptualized depression. In the Diagnostic and Statistical Manual of Mental Disorders the fifth edition (DSM 5), depression is seen on a continuum rather than fixed categories of disorder into which the patient must be forced. Moreover, the evidences suggest that depression is on a continuum from normal sadness to severe MDD. But the DSM 5 is beginning to be used in research. DSM IV is widely used by clinicians. Interestingly the US Centers for Medicare and Medicaid Services has recently called for providers to bill for services using the International Statistical Classification of Diseases and Related Health Problems 10^{th} edition (ICD-10) designations.

In Europe, the healthcare providers use for now, in order to diagnose the MDD, the ICD-10 criteria. In ICD-10, the depression diagnostic criteria are used as an agreed list of ten depressive symptoms divided into key symptoms and associated symptoms. The key symptoms must be present most days, most of the time for at least 2 weeks (persistent sadness or low mood *and/or* loss of interests or pleasure

and/or fatigue or low energy). If any of above present, ask about associated symptoms like - disturbed sleep, poor concentration or indecisiveness, low self-confidence, poor or increased appetite, suicidal thoughts or acts, agitation or slowing of movements, guilt or self-blame. The 10 symptoms then define the degree of depression and management is based on the degree: not depressed (fewer than four symptoms), mild depression (two or three of the above symptoms are usually present and the patient is usually distressed by these but will probably be able to continue with most activities), moderate depression (four or more of the above symptoms are usually present and the patient is likely to have great difficulty in continuing with ordinary activities.), severe depression (an episode of depression in which several of the above symptoms are marked and distressing, typically loss of self-esteem and ideas of worthlessness or guilt; suicidal thoughts and acts are common and a number of "somatic" symptoms are usually present). These symptoms should be present for a month or more and every symptom should be present for most of every day [5].

Also, we can have the situation when a patient does not meet the diagnosis threshold, but it has an impaired functionality and a significant degree of distress in its life. Having just a few persistent symptoms with low functionality and low life quality can be by itself a risk factor for MDD or MCI [6]. Subsyndromal depression or dysthymia are more common and have a negative impact on health of the older persons [6]. Interestingly, the incidence and prevalence of the sub-threshold depression (STD) is bigger than the incidence and prevalence of the MDD (between 8.6% and 14.1% for STD and from 1% to 4% for MDD) [7]. These rates were then lower than those of the peoples under 65 years old. This fact can be partially explained by the ICD/DSM strict criteria used to diagnose MDD that may not be suited to older population. This was underlined also by the 'EUORO-D' study results because it used an aged specific rating scale to compare symptoms of depression among European elderly. Also, a large cohort study proved that healthy older people were not at a greater risk of depression than the younger ones, so the increased MDD prevalence with age may be explained by the greater prevalence of the chronical somatic illnesses in the older people not by their age [8].

CLINICAL FEATURES IN GERIATRIC PATIENTS

It seems that no matter what the aetiologia of the MDD could be, the phenomenology is the same and the different clinical particularities are constant and specific [9]. The typical clinical features like sadness is minimize in older patient, but other clinical features like guilt, marked withdrawal, hypochondriasis somatization or psychomotor retardation/agitation are more common, and they are associated more with age than with the age at onset [9]. Moreover, they are more pronounced in females. Also, another feature of the later life depression is that these patients became excessively concerned about their physical health [9]. So, typical presentation of the elderly with MDD also can contain in addition to the features already discussed: insomnia, late onset of alcohol abuse, memory deficits, unexplained pain, deliberately minor self-harm, loneliness, exacerbated anxiety with somatizations, accentuation of the abnormal personality traits or behavioral disorders [9]. So MDD with no sadness and together with these other features can obscure the diagnosis of depression.

Also, typical for elderly is the apathy (it can be a symptom or a syndrome), which is a disorder of motivation rather than mood and it is different from depression. From the behavioral point of view the syndromic aspect consist in indifference, impoverished thoughts and indolence. From neurological point of view, it is associated with stroke, frontal lobe trauma

or degeneration, other traumatic brain injuries, multiple sclerosis, vascular or mixt dementias or depression [10]. From the biological psychiatry point of view apathy appears when there are imbalances in the subcortical-frontal connection (front-striatal circuits) like in the diseases of the basal ganglia, anterior cingulate and/or dorsolateral prefrontal cortex [10]. So, the front-striatal circuits are important in later life because if happens any disruption here, it will cause a dysexecutive syndrome [10]. Although there are overlaps between MDD and apathy, we can distinguish them. MDD is a mood disorder that can cause effects on apathy which are felt by the patient as distressing and it respond to the medication. On the other hand, apathy does not cause distress on the patient and is most of the time notices by the care givers and requires behavioral interventions.

From the clinical subtypes of depression (some other author considers it a form more severe form of MDD rather than a specific subtype), the psychotic depression is likely more present in later life than in the young adults. The classical delusions may include worthlessness, poverty or guilt but in older patients it mainly includes hypochondriacal delusions [11]. Also, in old age is far more present the Cowards syndrome in which the patients negate their own existence or physical body [11]. The most common abnormal perception in old age is auditory hallucination, which content is congruent with the mood [11].

Regarding the attempted suicide in older patients, they resemble successful suicide in its clinical characteristics. In older patients it can be a fatal mistake not to take seriously any deliberate act of self-harm, because elderly rarely fake suicide in order to attract attention or by accident. Even a sub-intentional suicide or a passive suicide must be very carefully assessed because these patients that show profound withdrawn, refuse food, reject help or suffer huge weight losses represent a heterogenous and hard to asses group. So, if we are unsure of the risk of suicide, we must prescribe with caution benzodiazepines, tranquilizes, sedatives, non-opiate analgesics or other drugs that have an overdose that can be reached easily with the prescribed quantity [6]. There are many suicide risk factors (male, living alone, no social support, chronic stressor or conditions, alcohol abuse, cultural or family history of suicide), behaviors (suicide plan expressed, altering wills, hoarding drugs, self-neglect, accidental overdoses or leaving notes behind) and illness factors (Psychosis, agitations, substances misuse, insomnia, guilt, hopelessness), in older patients, but the most important one is the history of self-harm [6]. In contrast to earlier research, recent studies have found relationship problems are the most prominent factor. However, in the past decade there has been inadequate examination of psychosocial precipitants, motivations and psychopathology and the way these factors interact. The possibilities of the psychological trait of hopelessness and the biological trait of low central serotonergic activity being linked with suicide attempts in the elderly require further research. Future studies should be prospective, longitudinal, use standardized measures, matched control groups and include evaluations of post suicide attempt interventions, hopelessness and central serotonergic activity [12].

The suicide prevention in elderly has received little attention, despite suicide rates being highest in older men, in the context in which almost 90% of older people who attempt, or complete suicide have a mental disorder (mostly MDD), which often has been inadequately treated [13]. Other treatable contributing factors include pain, grief, loneliness or alcoholism. Few suicides in older people occur in the context of terminal illness or can be regarded as "rational". Educational programs are required to improve the recognition and treatment of depression in primary care [13].

MDD AND THE DIFFERENTIAL DIAGNOSIS OF PSEUDODEMENTIA

Another important clinical aspect that we need to mention is the so called pseudodementia (a term invented in 1980, that probably it outlives its usefulness), which in most of the cases appear in older patients that accuses huge memory loses with fast onset. They also appeared to be amnestic, the attention is poor, but they do not present any deficit of the higher cognitive functions (aphasia, apraxia, acalculia) [14]. Pseudodementia term suffered in time few other modifications: Pearlson called it dementia of the depression and in 2002 Alexopulos called it Depression-Executive Dysfunction Syndrome (DEDS), term used until today [14]. This also implies different etiological pathways like vascular injuries to the FSC that causes executive disfunctions and amnesia from neurodegeneration of the limbic regions. Patients with DEDS seems to have higher risk of dementia, but it is no clear correlation to which type (speculation on the subject we can assume that DEDS patient are at risk for vascular dementia and the amnestic type are at risk for Alzheimer dementia, but there are no data to confirm this) [14]. What we know for sure is that MDD is a risk factor for later cognitive impairment or dementia [15]. This may be because of the depression action on the cortisol level, HPA axis or because of the commune inflammatory mechanism [16].

Around 25% of the people with MCI have significant depressive symptoms and 50% of the people with Alzheimer dementia have some depressive symptoms of clinical significance [17]. On these categories of patient, we can use Cornell scale in order to detect depressive disorder in dementia. Also, it is important to mention that dementia usually have a slow and insidious onset and the relatives, or the caregiver are the one that notice the memory disturbances and, on the memory, tests the patient may just guess. On the memory impairment from MDD, the patient is the one who is complaining and, on the memory, test struggles to give an answer or just give up. In dementia the high cortical function is compromised also. We must consider also that MDD often is a prodrome for dementia with a cut off around 10 years and beyond that is a risk factor for it. In this context a proper treatment and patient follow-up is required [17].

INTERRELATIONS BETWEEN MDD AND CARDIOVASCULAR DISEASES

An important association is between the coronary heart disease (CHD) and MDD. 20% of the peoples after a coronary event develop MDD [18]. 7.1% of the CHD patient has MDD and 5.3% have generalized anxiety disorder (GAD) [18]. American Heart Association recommends screening for depression all cardiac patients because the presence of MDD in old cardiac patient is an independent factor for vascular events. There are many biological possible explanations for the relationship between MDD and cardiovascular diseases:

- Endovascular low-grade inflammation, present in cardiovascular diseases (CVD) but also in MDD, proves that this is a two-way street for both pathologies [16].
- At the vascular endothelial level, the balance between the nitric oxide (NO) which has a vasodilator effect and endothelin (a peptide with vasoconstrictor action) is affected. So, the endothelial disfunction is considered to predict the atheromatous process [19].
- Autonomic system imbalance (HPA axis hyperreactivity leads to sympathetic overactivity and parasympathetic under-activity) from MDD is well known for decreasing the heart rate variability, decreasing the baroreceptors sensitivity and down regulating the beta-receptors. All these leads in the end in making the heart more susceptible for arrhythmias [19].
- The pallets seem more active in the depressed patients with CVD [19].

- MDD presence is also liked with the physical change in arteries: intima-media thickness (measurement for atheroma) is affected by depression presence at baseline in a 3 years study, after adjusting for confounding factors [20].
- To complicate the things even more, the MDD patients is reducing the like hood of taking the medication as prescribed and so these patients will have reduced treatment adherence, poorer life quality and more comorbidities.

MDD AND NEUROLOGICAL DISEASES

Also, the ***stroke*** is an important comorbidity with the MDD, because around 20% of the patients within develop depression in the first year after it. The peak prevalence of the MDD after stroke is between the 3rd and the 6th month, tailing off after 3 years [21]. Between the 1st and the 3rd year after the stoke 10 to 15% of the survivors remain affected [21]. It is an important comorbidity because post stroke MDD is one of the most important predictors for impaired quality of life, poorer functional recovery and a risk factor for cognitive decline [18]. Also, around 25% of the stroke survivors in the first 6 month after it begin to cry or laugh in inappropriate social situation (like laughing at a funeral) with little control of it [21]. There are theories that the MDD may appear after stroke that affect certain areas like closer to the anterior pole of the left hemisphere (by disruption of the routes connecting the cortex with the brain stem) but not all agree to that [18]. But to make a diagnosis can be difficult after a stroke and therefore we recommend using a scale like Stroke Aphasic Depression Questioner Hospital Version may help.

Moreover, MDD is a heterogeneous disorder from the clinical point of view, common in ***Parkinson Disease (PD)*** elderly patients. In some studies, almost 28% of the PD patient met DSM-IV criteria for a current depressive episode [22]. The best-fitting confirmatory factor analysis model had 3 factors (negative affect, apathy, and anhedonia). All factors are uniquely associated with depression status. Negative affect exhibited the strongest relationship. Psychological disturbance in PD is heterogeneous and can produce symptoms of apathy, anhedonia, and negative affect [22]. Apathy appears to be the core neuropsychiatric feature of PD, whereas negative affect (like dysphoria) seems to be most pathognomonic of depression. Future studies should examine the specific neural correlates and treatment response patterns unique to these 3 components [22]. In another study, the mentation, behavior and mood functions were studied, and the lack of motivation/initiative was most frequently observed in 83.6%of the patients, followed by depression – in 68.2% of the cases and memory disorders in 67.9% [23]. Thought the MDD diagnostic after the ICD criteria was the less frequent (26.9%). As result, all patients had a considerably reduced quality of life mainly due to the development of significant cognitive impairment [23]. From neurobiological point of view, L-DOPA administration does not seem to improve the mood in PD patients, and therefore SSRIs are administered because tricyclic agents (TCA) aggravate the constipation and the postural hypotension [24]. However, in a study with nortriptyline (a TCA), in PD patients with a mean age of 62 years old, was more effective than paroxetine [24]. Some authors concern that SSRIs can cause extrapyramidal effect is contro-versial. The combination of SSRIs and selegiline/rasagiline (MAO-B inhibitors) can lead to serotoninergic syndrome and ca be lethal (the cases are very rare) but the combination of an SSRI and a dopamine agonist was not more effective than either agent alone, or did not produce a more rapid onset of antidepressant action [25]. Combination therapy with escitalopram and pramipexole may not be well-tolerated [25]. The combination of tianeptine and moclobemide (a reversible and selective

inhibitor of monoamine oxidase) has been used to treat MDD in PD patients but the proof is mostly empirical. The electroconvulsive therapy may be effective in severe depression treatment and in improving the motor symptoms of the PD patient, but the results are temporary. Also, deep brain stimulation is can be a treatment for both MDD and PD, but paradoxically may cause MDD in PD patients.

OTHER MDD COMORBIDITIES

Maybe the most common psychiatric comorbidity of the MDD is represented by ***anxiety***. If comparing this association of comorbidities between different age classes, it was proven that a statistically significant higher percent from the very old compared to the old people experienced depression: OR=1.309, CI=1.066-1.609, p=.005. From the total number of the old patients, almost 70% presented anxiety compared to 58% from the very old age group, without statistically significant differences between the two groups: OR=.686, CI=.319-1.474, p=.498. So, we can conclude that MDD and anxiety are present with high rates of prevalence in the old age patients in geriatric presentation. Still, there is an increase in risk for depression in the very old age group. More research for identifying risk and protective factors in different segments of the old age people are necessary for both depression and anxiety [26].

Diabetes is also an important comorbidity for depression. Simultaneous occurrence of chronic diseases like diabetes, cancer, chronic obstructive pulmonary disease, and cardiovascular disease has been at the center of attention of specialists in highly developed countries [27]. A series of epidemiological studies demonstrated that depression is more likely to occur in people with diabetes regardless of whether the individuals are aware of their diabetes. In addition to depressive disorders, people with diabetes are also registering significant levels of diabetes-specific distress, which is clearly distinguishable from depressive disorders but can act as a risk factor for MDD. Epidemiological studies of depression and diabetes and their comorbidity have been carried out in the United States of America (USA), the United Kingdom, and some other high-income countries [27]. An important study of 30 022 adults in the USA showed that the risk of functional disability in people with diabetes was 2.42 times higher than in people who did not have diabetes; that in people with depression alone, it was 3 times higher than in people without depression; and that the risk for those who had MDD and diabetes, the risk was 7.15 times higher than in people who did not have depression or diabetes [27]. It was proven that it was a direct link between MDD presence and the onset of the diabetic complications and poorer glycemia control. The other way around, the level of the HbA1c was a predictor of the recurrent depression or the relapses of the MDD [28].

Chronic obstructive pulmonary disease (COPD) presence in a patient is linked with a high prevalence of depression ranging from 19.4% to 50% [29]. Majority of COPD patients have severe symptoms related to depression with increasing severity of COPD [29]. For example, in one recent study, out of the total COPD patient showed depressive symptoms in 51.76% [29]. Moreover, a higher depression scores 12.35 ± 9.18 was present in moderate to severe COPD. Depression was found to be higher among patients with higher CAT Score, SGRQ_S Score, SGRQ_I Score and SF-36-MCS scale (HRQoL) Score. Activity components of SGRQ (SGRQ_A Score) were found to be potential predictors of depression in COPD patients and a proportion mild moderate to very severe 43% 57% [29]. So, the clinicians and the patients both should be focused on adequate and timely management of both these comorbidities. There is no clear guideline regarding the pharmacological treatment but because of the

association of COPD with depression and anxiety symptoms SSRIs, mirtazapine, bupropion or tianeptine can be administrated. Benzodiazepines should be avoided because they depress the respiratory center. Cognitive behavioral therapy, peer groups and other psychological interventions have been found to alleviate the symptoms and improve the quality of live [30]. In mild and moderate MDD it seems that the psychotherapy is as effective as psychopharmacological treatments, in elderly peoples [30]. For the moment, it seems that CBT, behavioral therapy, interpersonal therapy, dynamic therapy has the most evidences in elderly peoples with depression [30]. Problem solving therapy seems to have a proven efficacy in younger adults with mild and moderate MDD [30]. The best therapeutically course of action and the best results were obtained when psychopharmacology was combined with psychotherapy, even in patient with severe MDD.

Another clinical and therapeutically challenge in geriatric patients is represented by the patients that have ***cancer and MDD***. The prevalence of depressive symptoms in patients with cancer exceeds those observed in the general population and depression is associated with a poorer prognosis in cancer patients [31]. The increased prevalence is not solely explained by the psychosocial stress associated with the diagnosis [31]. Pro-inflammatory cyto-kines, which induce sickness behavior with symptoms overlapping those of clinical depression, are validated biomarkers of increased inflammation in patients with cancer. A growing literature reveals that chronic inflammatory processes associated with stress may also underlie depression symptoms in general, and in patients with cancer. Therapeutic modalities, which are frequently poorly tolerated, are used in the treatment of cancer. These interventions are associated with inflammatory reactions, which may help to explain their toxicity [31]. There is evidence that antidepressants can effectively treat symptoms of depression in cancer patients though the database is meager. Novel agents with anti-inflammatory properties may be effective alternatives for patients with treatment-resistant depression who exhibit evidence of increased inflammation [31]. Antidepressant drugs should be considered for the treatment of moderate-to-severe major depression in cancer patients. Current evidence does not support the relative superiority of one pharmacologic treatment over another, neither the superiority of pharmacologic treatment over psychosocial interventions. The two main classes of medication for depression in cancer are tricyclic antidepressants (TCAs) and selective serotonin reuptake inhibitors (SSRIs). The choice of an antidepressant (AD) should be informed by individual medication and patient factors: the side effect profiles of the medication, tolerability of treatment (including the potential of interaction with other current medications), response to prior treatment, and patient preference [32]. TCAs have more adverse effects and a higher risk of overdose compared with SSRIs. However, a meta-analysis found no recommendation for one antidepressant type over another in cancer due to a lack of research [33]. The prescription of SSRIs must be carefully considered in patients receiving chemotherapy or radiotherapy, as SSRIs can often worsen emesis and nausea [34], whilst the anticholinergic effects of TCAs may worsen delirium associated with chemotherapy [34]. The use of AD in patients with terminal cancer may be unwise due to the delayed mode of action of these drugs [34]. An observational study supported this notion, concluding that currently prescribed antidepressants have little effect on improving depression in terminally ill depressed cancer patients, as measured by depression scores [33]. In one trial, methylphenidate provided moderate to marked improvement in depression symptoms in 73% of depressed oncology

patients within two days; this AD may be an effective alternative to conventional antidepressants [33]. But, the trials of methylphenidate have been promising, physiological tolerance develops quickly, and doses must be increased [33]. Also, Ketamine that has recently been studied for its rapid and effective antidepressant effects, due to its antagonism of NMDA receptors [33]. Ketamine has been suggested as a treatment of depression in terminally ill cancer patients where rapid reversal of depression is vital. A trial in a single patient with advanced cancer, however, exerted initially positive but unsustainable effects; larger randomized trials are necessary to assess the role of ketamine in treating depression in terminal patients [33]. We must consider that chemotherapy drugs may interact with antidepressants and cause nervous system toxicity, by reducing the metabolism of the antidepressants or by additive effects of the cancer drugs themselves [33]. Some antidepressants may reduce the efficacy of chemotherapeutic drugs (for example SSRIs prescribed together with tamoxifen, may reduce the metabolism of tamoxifen to its active metabolite - endoxifen, by inhibiting the hepatic CYP2D6 enzyme and this means the decreasing of the effectiveness of the drug and increases the risk of breast cancer relapse).

CONCLUSION

So, besides different clinical particularities, patient's fragility and comorbidities, when we face MDD in an elderly we must also, look at his medication, because certain chronic drug treatments can induce depression. So, we must look for drugs like non-selective beta-blockers, methyldopa, reserpine, clonidine, digoxin, nifedipine, steroids, analgesic drugs (opioids, indomethacin), antiparkinsonian drugs (levodopa, amantadine, tetrabenazine), interferon, sulfonamides, neuroleptics or benzodiazepines. MDD can appear also in some medical conditions like - diabetes, hypothyroidism, Cushing disease, hypercalcemia, pernicious anemia, sub-nutrition, cerebrovascular disease, stroke, CNS tumor, Parkinson's disease, multiple sclerosis, systemic lupus erythematosus, Alzheimer's disease, carcinoma, neurosyphilis, brucellosis, neurocysticer-cosis, myalgia or AIDS. In all these cases only and multidisciplinary approach can lead to the best course of treatment.

Conflicts of interest

The authors declare no conflicts of interest.

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ECHOCARDIOGRAPHY IN THE ELDERLY

*Elena Mihaela **Mihu**[1]*

[1]"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania

Corresponding author: Elena Mihaela Mihu, ileanamihu@yahoo.com

Abstract. Heart structure changes with age. Due to increased life expectancy, a growing percentage of the population presents such changes. Old age is also linked to a high prevalence of comorbidities, including cardiac comorbidities. It is therefore imperative to know the physiological changes that occur in the elderly people in order to be able to differentiate the normal of pathological. In addition to the clinical examination and ECG, echocardiography provides important information about heart changes taking place in elderly people. Echocardiography assess structural changes (left ventricular hypertrophy, changes in heart geometry, fibrosis and valvular calcifications) and functional changes (systolic and diastolic dysfunction of the left ventricle with decrease of the left ventricle compliance, increase of myocardial stiffness, lusitrope function alteration, decrease of early diastolic filling and increase of atrial contraction, leading to atrial dilatation and left atrium remodeling. In elderly, the left ventricle ejection fraction is preserved, but the peak cardiac output in effort is lower compared to young people. In addition, the elderly have specific pathologies, such as senile cardiac amyloidosis.
Key words: echocardiography, elderly, valvular calcifications

Rezumat. Odată cu înaintarea în vârstă au loc modificări structurale la nivelul cordului. Datorită creşterii speranţei de viaţă, un procent tot mai mare din populaţie prezintă astfel de modificări. Înaintarea în vârstă este legată totodată de o prevalenţă mare a comorbidităţilor, inclusiv cardiace. Devine astfel imperios necesară cunoaşterea modificărilor fiziologice care au loc la vârstnici pentru a putea diferenţia normalul de patologic. Alături de examenul obiectiv şi ECG, ecocardiografia aduce informaţii importante referitoare la modificările cardiace care au loc la vârstnici. Ecocardiografia evaluează modificările structurale (hipertrofia de ventricul stâng, modificări în geometria cardiacă, fibroze şi calcificări valvulare) şi funcţionale ale cordului (disfuncţie sistolică şi diastolică de ventricul stâng cu scăderea complianţei ventriculului stâng, creşterea rigidităţii miocardice, scăderea umplerii diastolice precoce şi creşterea contracţiei atriale care duce la dilatare atrială, remodelare de atriu stâng, alterarea funcţiei lusitrope). La vârstnici, fracţia de ejecţie a ventriculului stâng este prezervată, dar debitul cardiac maximal la efort este mai mic decât la tineri. În plus, vârstnicii au patologii specifice, precum amiloidoza cardiaca senila.
Cuvinte cheie: ecocardiografie, vârstnici, calcificări valvulare

INTRODUCTION

According to Michael Rose, aging is defined as "a decline or loss of adaptation with increasing age, caused by a time-progressive decline of natural selection. Biologists define aging as "a decline or loss of adaptation with increasing age, caused by a time-progressive decline of Hamilton's forces of natural selection."[1].

Adaptation decrease in time is due to cardiac physiological, structural, and functional changes. The population distribution by age shows an increased number of old people, so the prevalence of physiological echocardiographic changes in elderly increases.

The recognition of these physiological changes is important for the differential diagnosis between a normal, but old heart, and a pathologically modified heart, so it helps to establish the diagnosis of diseases in elderly. Often there is no difference between the changes due to physiological aging and those due to the disease. The differences are more difficult and important to establish as the prevalence of cardiovascular disease increases with age.

There is a higher probability that an elderly will have cardiovascular disease compared to a young person (chronic coronary syndrome expressed as kinetic abnormality in ultrasound, arterial hypertension expressed as left ventricular hypertrophy in ultrasound, atrial fibrillation expressed in ultrasound as atrial dilation).

On the other hand, cardiac changes associated with aging increase the risk of cardiovascular disease. This creates a

vicious circle. These changes decrease the cardiac functional reserve and increase the risk of left ventricular hypertrophy (LVH), heart failure and atrial fibrillation which in turn are interdependent. LVH leads to decreased left ventricle (LV) compliance and diastolic LV dysfunction. Dilation and remodelling of left atrium (LA) and pulmonary veins in the presence of diastolic dysfunction increase the risk of arrhythmogenesis with the appearance of atrial fibrillation (AFib). AFib in turn aggravates diastolic dysfunction. The cardiac changes in the elderly decrease the manifestation threshold of some pathological disorders and decrease the heart capacity of adapting to physiological conditions (decrease the functional reserve). An ischemic episode asymptomatic in young people, in the elderly may be associated with a severe symptomatology.

The main structural changes that occur with advanced age are LVH, ventricular systolic and diastolic dimensions discrete decreasing (especially in women), left atrium and aortic root dilation (in both genres), valves thickening and fibrosis with physiological regurgitations worsening, increase in the amount of epicardial fat both anterior and posterior (especially in women), pericardium thickening and stiffening. Foramen oval is less prevalent in the elderly but when present, it is wider [2]. Sometimes, normal aging changes is similar to some heart disease: sigmoid-shaped ventricular septum may mimic hypertrophic cardiomyopathy, mitral leaflet "buckling" may mimic floppy mitral valve [3].

Regarding cardiac functional changes, significant alterations occur in left ventricular diastolic filling time, with decreased early filling and increased atrial filling velocity and mildly prolonged early deceleration and isovolumic relaxation time. These changes in diastolic function are relatively uniform and independent of other age-related changes.

Histological Changes

In the aging heart produces cardiomyocyte hypertrophy, transition from fibroblasts to myofibroblasts, extracellular matrix protein accumulation in the interstitium, interstitial fibrosis, fibrotic remodelling, subepicardial fat accumulation, myocardium brown atrophy, focal amyloid deposits increase and calcific deposition in the mitral annulus aortic valve, and epicardial coronary arteries. Collagen accumulates in the heart due to its reduced degradation [4]. These histological changes lead to visible echocardiographic changes.

Structural Echocardiographic Changes

1. Left ventricular remodeling

Since 1983 it has been found that left ventricular mass increases with age (Framingham study). According to these data, blood pressure and body weight are the most important risk factors associated with increased left ventricular mass. The question arose whether aging inevitably leads to LVH or if left ventricular mass remains stable in the absence of risk factors [5].

Subsequent studies have shown that left ventricular wall thickness and left ventricular mass are correlated with age, in both sexes, but also with systolic blood pressure, body mass index and mitral regurgitation [6].

Cheng MRI study included patients enrolled in MESA (Multi-Ethnic Study of Atherosclerosis) aged 45 to 84 years in the 4 ethnic groups (non-Hispanic white, black, Hispanic and Chinese), without cardio - vascular disease at the time of enrollment (ischemic coronary disease, peripheral arthritis, cerebrovascular disease or heart failure). This study shows a discrete decrease in the absolute value of left ventricle mass in the elderly, but a significant increase in the mass / volume ratio with aging [7].

Also by MRI studies, in 2013, a subset of patients (without cardiovascular disease and without hypertension) enrolled in the

Framingham study, showed LV volume but not the LV mass decrease. Advanced age increased the LV concentricity and ejection fraction. It has not been established, however, whether the increased concentricity was due to physiological aging or subclinical disease [8].

In 1990, a group of patients over 55 years old showed an increased prevalence of LVH, despite the controlled values of blood pressure in 2 years preceding the study. Moreover, the LVH presence did not correlate with the hypertension control level, neither with therapeutic strategy [9].

Left ventricular hypertrophy may occur even in the absence of pressure changes, due to the myocytes size increase. In addition, in the very old, amyloid deposits accumulate in interstitial space.

2. Changes in the heart geometry

In the elderly, the ascending aorta shifts rightward, and the basal interventricular septum moves posterior, leading to left ventricular ejection tract narrowing. Left atrium and aortic root dilates in both genders. Increased epicardial fat widens the echolucent pericardial stripe, both anterior and posterior, particularly in women. The atrial septum thickens and becomes stiffer [2].

With aging, basal interventricular septum bends leftward, bulging into the left ventricular outflow tract. This is due to decreased long axis dimensions, but also to the rightward shift of the ascending aorta. The basal ventricular septal bulge into the left ventricular outflow tract may mimic hypetrofic cardiomyopathy. The resemblance is even greater as both the old heart and the hypertrofic cardiomyopathy associate small cavities, thick ventricular walls and dilated atria. The differences consist in the dilation of the ascending aorta in the elderly, associated with the thickening and calcification of the aortic cusps [3].

3. Valvular fibrosis and calcification

With aging, fibrosis and valvular calcifications appear especially mitral and aortic ring calcifications.

Aortic sclerosis is a common finding in clinical practice, characterized by the calcium and fibrous tissue deposition in aortic valve, with the thickening of aortic valvular leaflets, without narrowing the ejection tract of the LV. The aortic sclerosis lesions show many histological similarities with atherosclerotic lesions [10].

The frequency of aortic sclerosis is around 26% in the population over 65 and increases with age [11].

Over time, aortic sclerosis may progress to clinically manifest aortic stenosis, and therapeutic options are limited. Statin, ACE-inhibitors, ARBs and bisphospho-nates trials have been performed to investigate aortic sclerosis treatment, but none of these therapeutic classes has proved its effectiveness. It has been hypothesized that these therapeutic classes could be effective in the early stages of valvular calcification, but not in advanced ones, when aortic stenosis is present [12].

Calcium and fibrous tissue deposit occurs not only in aortic valve, but also in the mitral ring and can lead over time to mitral regurgitation and / or stenosis.

The prevalence of mitral ring calcification varies between 5 and 42%, depending on the age, sex, diagnostic imaging method, and the associated risk factors [13]. A study including elderly subjects (over 90 years old) who underwent autopsy showed a direct correlation between mitral ring calcification and age [14]. Mitral calcification lesions are very similar to aortic sclerosis lesions and atherosclerosis.

Due to life expectancy growth and limited therapeutic options, the prevalence of this condition increased in recent years. Balloon valvuloplasty is not recommended due to valvular calcifications, and open surgery is burdened by many complications, especially in elderly. In addition, transcatheter valve implantation

is difficult due to mitral calcifications and due to particular anatomy of the mitral apparatus [15].

Conduction system fibrosis, sinus node cells diminution, fat and collagen quantity increase in the sinus node and atrioventricular node fibrosis are also over time changes, but they cannot be detected by ultrasound.

Functional echocardiographic changes - Systolic and diastolic function

In patients over 50 years old, left ventricular ejection fraction decreasing below 55% is correlated with 3-fold increase in the risk of developing heart failure and with risk of death doubling [16, 17]. A study of 4257 patients enrolled in the Framingham trial showed an increased prevalence of asymptomatic systolic left ventricular dysfunction with age, higher in men (86%). In almost half of the cases the patients had a myocardial infarction history [18].

The Cardiovascular Health Study found that although the risk of heart failure death in elderly is lower in people with normal ejection fraction compared to the risk of heart failure death in those with low ejection fraction, more deaths have been associated with normal ejection fraction. This can be explained by the higher prevalence of preserved ejection fraction heart failure, higher than decreased ejection fraction heart failure [16].

Even if, over time, the ejection fraction remains preserved, speckle tracking changes in the contractile function may occur. In a study published by Zghal, the echocardiographic changes were analyzed in 45 elderly patients and 45 young patients without cardiovascular disease, and no differences were identified regarding the ejection fraction in the 2 groups. However, it was found that the overall longitudinal strain was significantly lower in elderly patients. There were no differences between the transversal global strain and the circumferential global strain in young vs. old people [19].

The prevalence of normal ejection fraction heart failure increases with age, particularly in women. Advanced age and female gender are associated with increases in vascular and ventricular systolic and diastolic stiffness even in the absence of cardiovascular disease [20]. Ventricular diastolic stiffness may contribute to the pathogenesis of preserved ejection fraction heart failure.

Patients with preserved ejection fraction heart failure are usually older compared to those with low ejection fraction heart failure. At the same time preserved ejection fraction heart failure appears more often in women than in men [21].

About half the patients presenting heart failure symptoms have diastolic dysfunction with preserved ejection fraction. Diastolic dysfunction, whether or not associated with heart failure symptoms, correlates with increased all causes mortality [22].

The protodiastolic left ventricular filling is proportional to the mitral valve anterior leflet closure rate. With aging, the E-F slope decrease, this may indicate early diastolic filling age-decreasing [23].

Right Ventricle Systolic and Diastolic Function

A MRI study of 120 healthy patients, (of which 60 women and 60 men) analyzing the right ventricle correlation between systolic and diastolic function, concluded that right ventricle mass and volume decreased significantly with age, while the ejection fraction increased. Regarding diastolic function, E wave decreased, A wave increased, with the decrease of the E / A ratio. Increased body surface area was associated with increased right ventricle mass, volume and E wave amplitude [24].

DISCUSSIONS

Over time, echocardiographic changes are more frequent, reflecting the existing cardiac pathology. The high prevalence of hypertension in the elderly leads to LVH and diastolic LV dysfunction. In patients

with chronic coronary syndromes, kinetic changes of LV walls frequently occur, left ventricular aneurysms can be identified, and the ejection fraction decreases. The most common valve disease etiology in elderly is degeneration. The rhythm disorders cause the heart cavities dilation leading to a vicious circle They maintain the arrhytmia and over time lead to the cardiac function impairment (initially the diastolic function is affected, then the systolic function is affected).

On the other hand, some physiological changes that occur in the elderly's heart may become severe enough to lead to clinically manifest cardiac dysfunction. Mitral ring calcification can lead over time to mitral regurgitation, mitral stenosis or heart block. Calcific deposits in the aortic valve can transform aortic sclerosis into clinically manifest aortic stenosis. Focal and localized deposition of amyloid, without clinical expression at first, can turn into symptomatic senile cardiac amyloidosis, fatal in the absence of treatment [3].

There are 3 types of cardiac amyloidosis, depending on the type of proteins deposits: AL type amyloidosis, hereditary transtyretin amyloidosis (ATTRm) and ATTRwt amyloidosis (wild type transtyretin amyloidosis). Among them, wild-type transtyretin amyloidosis is age-specific and it is also called senile cardiac amyloidosis. Cardiac amyloidosis symptoms are nonspecific, and diagnosis is often difficult. In order to treat amyloidosis, it is important to identify the type of protein deposits. AL-type amyloidosis is associated with reduced survival compared to ATTRwt amyloidosis, and although it has been attempted to develop differential diagnostic algorithms between the two types of amyloidosis, the gold standard for diagnosis remains the histological examination [25].

CONCLUSIONS

In elderly, physiological cardiac changes decrease the heart functional reserve and also the disease manifestation threshold. The association of multiple comorbidities is present, but the cardiovascular disease is one of the main causes of mortality at elderly patients. On the other hand, a number of physiological changes may mimic cardiovascular disease or may lead, by their aggravation, to the symptomatic cardio-vascular diseases (mitral / aortic calcifications / amyloid deposition) appearance. In this context, for a complete and correct heart disease diagnosis in elderly patients, it is necessary for the clinician to know the echocardiographic changes that occur in this age category: LV remodeling, changes in heart geometry, valvular calcifications, and functional changes. Frequently is difficult to obtain a good ultrasound view in the elderly. Age, gender, and body size should be taken into account when interpreting echocardiographic findings.

Conflicts of interest

The authors declare no conflicts of interest.

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STUDIES REGARDING INTERRELATIONSHIP BETWEEN TYPE 2 DIABETES AND CANCER

Cristina ***Ionescu***[1]*, Claudia* ***Borşa***[1]

[1] *"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania*

Corresponding author: Cristina Ionescu, cristinaionescucristina@gmail.com

Abstract. Lately, there has been concern about type 2 diabetes occurring in patients previously diagnosed with cancer. To date, the risk of type 2 diabetes patients to develop cancer of different types has been investigated more extensively. This paper has selected data on diabetes in relation with cancer and also with regard to incidence of cancer in relationship to time of diabetes diagnosis. A cohort study to investigate incidence of obesity-related cancers in relation to the time of diabetes diagnosis established that obesity-related and all cancer incidence was increased throughout year two to year five after diabetes diagnosis. In contrast, kidney tumors, pancreas, liver, gallbladder, blood, lung, breast, stomach and thyroid cancers, have been associated with a significantly increased risk of subsequent diabetes, not caused by classical diabetes risk factors. Concomitant viral hepatitis related-cirrhosis and type 2 diabetes increase risk for hepatocellular carcinoma. It was specified that increased mortality in type 2 diabetes patients with cirrhosis and subsequent hepatocellular carcinoma was caused by complications of the liver disease not diabetes' complications. Several limitations of studies associating type 2 diabetes with cancer were underscored, namely that cancer is a plurifactorial process and insulin not a carcinogen respectively, heterogeneity of studies, speculated results and overestimation of study-effects. Advances in molecular biology and methodologies of studies will provide more precise information concerning diabetes as a likely risk factor for developing cancer. On the other hand, diabetes has prognostic value for estimating survival of patients initially diagnosed with cancer and subsequently, type 2 diabetes.
Key words: type 2 diabetes, types of cancer

Rezumat. Una dintre preocupările recente o reprezintă apariţia diabetul tip 2 la pacienţii diagnosticaţi iniţial cu boli maligne. Riscul ca pacienții cu diabet tip 2 să dezvolte diferite tipuri de cancer a fost investigat pe larg. Acest articol a selectat date în ceea ce privește interrelația dintre diabetul tip 2 și riscul de dezvoltare a unor boli maligne, precum și privind pacienți cu boli maligne ulterior diagnosticați cu diabet. Un studiu-cohortă pentru investigarea incidenței cancerelor asociate obezității în corelație cu data diagnosticării diabetului, a stabilit că incidența a fost crescută în intervalul de timp doi-cinci ani de la diagnosticarea diabetului. Prin contrast tumorile de rinichi, pancreas, ficat, colecist, plămân, stomac, tiroidă, cancerul mamar și cancerul limfatic au fost asociate cu riscul crescut de apariție a diabetului după diagnosticarea bolii maligne, în acest caz "diabetul nefiind determinat de factorii tradiționali de risc diabetic". Ciroza apărută în urmă hepatitei virale și concomitentă cu diabetul, crește riscul de carcinom hepatocelular. S-a specificat că mortalitatea în cazul pacienților diabetici cu carcinom hepatocelular, este cauzată de complicațiile bolii de ficat și nu de cele diabetice. Câteva limitări ale studiilor au fost subliniate, respectiv faptul că boala malignă este un proces plurifactorial, insulina nefiind agent carcinogen, heterogenitatea studiilor, rezultatele speculative și supraestimarea efectelor constatate. Progresele din biologia moleculară și cele ale metodologiilor pentru diverse studii vor oferi informații mai precise legate de diabet ca factor de risc pentru dezvoltarea cancerului. Pe de altă parte, diabetul are valoare prognostică pentru estimarea ratei de supraviețuire a pacienților inițial diagnosticați cu boli maligne și ulterior cu diabet tip 2.
Cuvinte cheie: diabet tip 2, boli maligne

INTRODUCTION

Lately, there has been concern about type 2 diabetes occurring in patients with different types of cancer. More data in regard to tumor-induced insulin resistance and diabetes are probably necessary. By now, numerous studies showed that type 2 diabetes patients are at risk to develop cancer. It has been pointed out that the signaling pathways downstream of the activated insulin receptor isoform IR-A and IGF-I receptor are known to stimulate cancer cell proliferation, survival, migration, and invasion, while insulin receptor isoform IR-B is more closely linked to metabolic regulation [1]. Increased IR-A/IR-B ratio and IR-A overexpression determine cancer cells to divide in response to insulin and IGF-II, is produced locally, by both stromal and

epithelial cancer cells. Also, IR-A overexpression in cancer may promote resistance to IGF-I receptor-targeted therapies [2].
This paper has selected data on type 2 diabetes in relation with cancer and also with regard to incidence of cancer in relation to time of diabetes diagnosis.

STUDIES SUPPORTING THE LINK BETWEEN DIABETES AND CANCER

Epidemiological studies that link type 2 diabetes and cancer of different types are complex. Using data of several clinical studies, Matyszewski A. et al. showed C-peptide, insulin and IGFBPs level variations in patients with colon, colorectal and other types of cancers [3]. The authors cited the Physicians' Health Study, a prospective, case control study, which pointed out high C-peptide concentrations in patients with colon cancer. According to this study, subjects of the highest C-peptide concentration quintile were of older ages and had highest levels of risk factors for malignancy like smoking, alcohol consumption, body mass index and lack of physical activity. In patients undergoing surgical treatments for colorectal cancer, the high C- peptide levels were related to increased risk of death. Previously, Djiogue S. et al. have suggested as well that high C-peptide levels associated the risk for colorectal cancer [4]. However, Nogueira L. et al. in 2017 highlighted also in a case control study, which enrolled 1800 subjects that circulating C-peptide concentrations were negatively associated with pancreatic ductal adenocarcinoma only in current smokers. These authors concluded that smoking status is confounding associations between biomarkers of insulin secretion and pancreatic ductal adenocarcinoma [5].
Farrell G. showed in Japanese patients with type 2 diabetes that hepatocellular carcinoma was the most common malignancy, followed by lung, pancreas, and stomach cancer. Diabetes is an independent risk factor for hepatocellular carcinoma HCC that increased risk for the later mentioned by 3- to 4-fold in men, more than 50-fold in obese people with hepatitis B or C, also patients with sustained viral responses and those with hepatocellular carcinoma recurrence after curative therapies [6]. Sharma A. et al. used a score for patients with newly onset diabetes who developed pancreatic cancer - The Rochester Epidemiology Project, 2015. The score (the Enriching New-Onset Diabetes for Pancreatic Cancer ENDPAC) was based on changes in weight, blood glucose and age at diabetes diagnosis. An ENDPAC score of at least 3 identified patients who developed pancreatic cancer three years after diabetes diagnosis ("area under receiver operating characteristic curve 0.87, 80% sensitivity and 80% specificity"). A zero ENDPAC score was found out in patients who had extremely low risk for pancreatic cancer [7].
In an interesting study that investigated the incidence of obesity-related cancers in 71648 women and men, in relationship to the time of diabetes diagnosis, Schrijnders D. et al. established that two to five years after diabetes diagnosis, obesity-related and all cancer incidence was substantially and significantly higher in women and nevertheless, was increased throughout year two to year five after diabetes diagnosis. In men it was suggested that advanced prostate cancer might not be positively related to obesity" as in obese males there were no differences regarding cancer risk after they were diagnosed with diabetes [8]. Also concerning time of diabetes diagnosis and risk of malignancy, de Kort S. et al. noticed an initial spike in colorectal cancer CRC risk in the first six months after type 2 diabetes diagnosis in patients, both men and women, and a subsequent lowering of the effect size of overall CRC risk after these six months were excluded from the statistical analysis [9].
An observational study published last year attempted to show the contrary, namely that diabetes occurred in patients already

diagnosed with cancer [10]. According to this study, nine different types of cancer, namely kidney tumors, pancreas, liver, gallbladder, blood, lung, breast, stomach and thyroid cancers, were associated with a significantly increased risk of subsequent diabetes, which was not caused by traditional diabetes risk factors. Study results reported for more than half a million Korean patients investigated between 2003 and 2013, pointed out that "the risk of diabetes was highest in the two years following cancer diagnosis, and remained elevated during the entire follow-up period. Overall, the hazard ratio (HR) for diabetes associated with cancer was "1.35, after adjusting for sex, metabolic factors, comorbidities and pre-cancer risk factors". The risk for diabetes was increased five-fold in participants diagnosed with pancreatic cancer (HR 5.15), while colorectal and endometrial cancers were not associated with increased risk of subsequent diabetes. Both effects of cancer and treatments of cancer can advance diabetes onset. For example, cachexia as cancer effects is associated with insulin resistance, impaired glucose tolerance, and diabetes [10]. To these studies adds another type of statistical approach, which further concerned survival in cases of patients with hepatocellular carcinoma. Piscaglia F. et al. modeled survival based on clinical parameters, lead-time bias and propensity analysis [11].

A distinct part of researches concerns associations between cirrhosis caused by viral hepatitis, diabetes and hepatocellular carcinoma. In a previous study on hepatitis C virus and diabetes, Hammerstad S.S. et al. showed that there may be no associations between the two pathologies because of subtle variations in HCV genotype, ethnicity and severity of liver disease [12]. In contrast Li J. et al. noted the complex relationships of cirrhosis-related to hepatitis viruses B or C with type 2 diabetes [13]. On one hand, cirrhosis increases risk for type 2 diabetes and on the other hand, existing diabetes accelerates hepatitis C virus infection toward cirrhosis [13]. Furthermore, concomitant viral hepatitis related-cirrhosis and diabetes mellitus increase risk for hepatocellular carcinoma [14]. Ramachandran T.M. et al. specified that increased mortality in diabetic patients with cirrhosis and subsequent hepatocellular carcinoma was not caused by diabetes-related complications but mostly, complications of the liver disease [14]. Concerning antiviral treatments for hepatitis virus C or B, Li J. et al. also underlined that treatments reduced incidence of diabetes mellitus but effects of these treatments on diabetes' complications are by now unknown [13].

STUDIES THAT CONTRADICT THE ASSOCIATION OF DIABETES WITH CANCER

There is also the view that associations of diabetes with cancer are much speculated and both small study-effects and overestimation are found out in investigations addressing this topic.

Godsland I.F. underscored that cancer is a plurifactorial process and considered that "insulin itself does not induce somatic cell mutations and cannot, therefore, be taken into account as carcinogen". "Pre-malignant lesions may be present in a high proportion of healthy individuals, and these lesions might progress to invasive cancer" only through imbalances, metabolic abnormalities and inborn errors of metabolism [15]. Also, according to Godsland I.F. diabetic patients could be at the same time relatively hypoinsulinemic and consequently considered, at low risk of developing cancer. Another specification Godsland I.F. made, concerns very difficult recruitment of study-patients. Participants enrolled in a study are supposed to undergo numerous investigations during a long period of time. Tsilidis K.K. et al. reported in a meta-analysis, substantial heterogeneity between studies, small study effects and excess

significance, all three because of which, associations between type 2 diabetes and risk of hepatocellular and pancreatic cancers may be invalidated [16].
Additionally, there was reservation about researches, as for example, in case- control studies IGF-1 can reflect tumor metabolism also, and therefore should not be taken into account as impact on risk of developing cancer [17].

CONCLUSION

Advances in molecular biology and methodologies of studies will help provide more precise information for taking into account, on one hand insulin resistance and diabetes as likely risk factors for developing cancer. On the other hand, diabetes has prognostic value for estimating survival of patients with cancer.

Conflicts of interest

The authors declare no conflicts of interest.

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THE LIFE SPACE MOBILITY ASSESSMENT AND THE SOCIAL FRAILTY

Doina ***Roditis***[1]*, Rozeta* ***Drăghici***[1]*, Elena* ***Lupeanu***[1]*, Cătălina Monica* ***Pena***[1]*, Irina* ***Dumitrescu***[1]*, Mariana* ***Răchită***[1]*, Doina* ***State***[1]*, Violeta* ***Bogdăneanu***[1]

[1] *"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania*

Corresponding author: Doina Roditis, elena.roditis@gmail.com

Abstract. Lately, WHO approaches the study of frailty from a functional perspective. When the functional reserve moderately decreases, behavioral adaptive changes can appear to restore the balance. Such a change is the life space mobility (LSM) constriction, considered a frailty marker. The gerontological literature reveals many domains of frailty research: physical, cognitive, psychological and social. Both the cognitive and the depressive frail phenotype include physical frailty elements in their definitions. Being a mobility measure, LSM certainly assesses physical frailty. Objective: We analyze the links between LSM and some social aspects to see if LSM can assess social frailty. Method: A sample of 281 NIGG inpatients between 45 and 98 years old is globally evaluated by tests referring to: physical functioning (Up and Go Test, Life Space Mobility/LSM), nutritional status (BMI), psycho-sensorial functioning (depression/GDS and fatigue - Brief Fatigue Inventory) and social situation. Results: The weight of frailty assessed by LSM is 27.5%. Firstly, a part of the frail persons depending on the relatives/friends support can be considered socially frail. Secondly, we found significant correlations between LSM and social aspects as: age (r=-0.549/ p=0.000), gender, high school graduation (r=0.146/p=0.015), social support network (r= 0.185/ p=0.032), number of chronic conditions(involving social aspects through the potential "sickness behaviour"). Other important variables revealing an extended LSM are: the high "interest in every day life" and the "satisfaction of social relations", psycho-social positive aspects that surely help elderly to maintain an active lifestyle. Conclusions: The LSM assessment can be considered a good measure of the social frailty, not only of the physical one.
Key words: functional ability, social frailty, life space mobility

Rezumat. În ultima vreme, OMS abordează studiul fragilității din perspectiva functionalității. Când rezervele funcționale scad moderat, pot aparea schimbări comportamentale adaptative pentru refacerea echilibrului. O asemenea schimbare este constricția Mobilității în Spațiul Vital (MSV), considerată un marker al fragilității. Literatura gerontologică relevă mai multe domenii ale fragilității: fizic, cognitiv, psihologic și social. Atât fragilitatea cognitivă, cât și cea însoțită de depresie includ elemente de fragilitate fizică în definiție. MSV, o modalitate de măsurare a mobilității, sigur evaluează fragilitatea fizică. Obiectiv: Studiul corelațiilor dintre MSV și câteva aspecte sociale pentru evidențierea posibilității evaluării fragilității sociale prin MSV. Metoda: 281 pacienți cu vârste între 45-98 ani sunt evaluati prin teste pentru: funcționalitate fizică (Up and Go Test, Mobilitatea în Spațiul Vital/MSV), stare nutrițională (IMC), funcționalitate psiho-senzorială (depresie-scala depresiei geriatrice/ GDS, oboseală-Scurt test de evaluare a obosealii*)* și situația socială. Rezultate: Ponderea fragilității evaluată prin MSV este de 27.5%. În primul rând, persoanele fragile ce depind de susținerea rudelor/prietenilor pot fi considerate și social fragile. În al doilea rând, există corelații semnificative între MSV și aspecte sociale ca: vârsta (r=-0.549/ p=0.000), genul, absolvirea liceului (r=0.146/ p=0.015), rețeaua de support social (r= 0.185/ p=0.032), numărul de boli cronice(implică aspecte sociale prin potențialul „comportament de boală". Alte variabile importante relevând un Spațiu Vital extins sunt: „interesul crescut pentru evenimentele cotidiene" și „satisfacția fată de relațiile sociale", aspecte psiho-sociale pozitive care îi susțin pe vârstnici să mențină un stil de viată activ. Concluzii: Evaluarea MSV poate fi considerată un bun indicator al fragilității sociale, nu numai al fragilității fizice.
Cuvinte cheie: abilitate funcțională, fragilitate socială, mobilitate în spațiul vital

INTRODUCTION

When WHO formulates a public health strategy on aging, healthy aging is considered in a holistic sense, based on functional perspectives and on the life-course vision. Healthy ageing is the process of developing and maintaining the functional ability that enables well-being in older age. The concept of functional ability represents health-related attributes that permit people to do what they consider valuable to themselves. In the healthy

ageing model (Fig. 1), functional ability includes two components in permanent interrelation. The first component, intrinsic capacity is formed of genetic inheritance and personal characteristics of health. The second component, extrinsic capacity is represented by social and physical environment of an individual. Health characteristics from intrinsic capacity include**:** underlying age-related trends, behaviors, physiological changes and risk factors, diseases, changes in homeostasis and geriatric syndromes [1].

The frailty is one of the modern geriatric syndromes, along with sarcopenia, anorexia of ageing and cognitive impairment. In 1965, Bernard Isaacs coined the first giants of geriatrics: immobility, instability, incontinence and intellectual impairment (delirium and dementia).

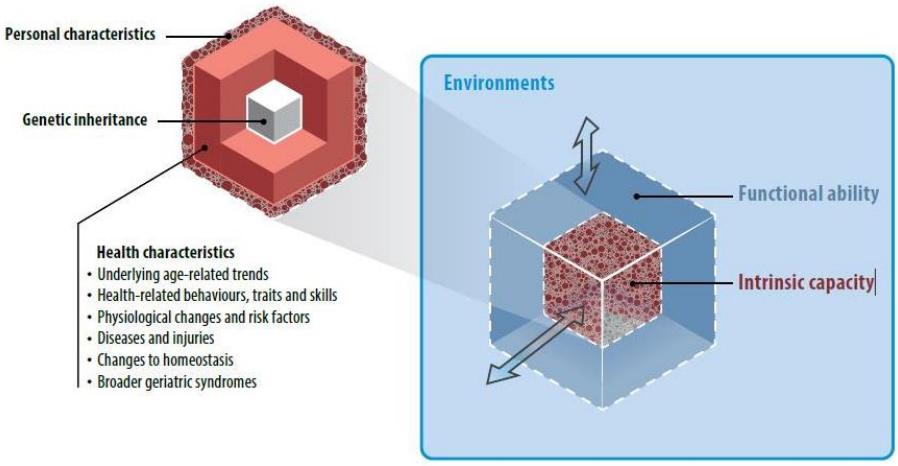

Fig. 1 Healthy Ageing from WHO - World report on ageing and health, 2015

Frailty has been defined as a syndrome involving a high vulnerability to stressors due to reduced functional capacity of various physiological systems. It involves the loss of resilience in the face of internal or environmental challenges, affecting different but interlinked physiological systems. The concept of resilience may be defined as the individual's ability to adapt in the face of stresses and adversities. It is a complex construct depending on a network or interaction of biological, clinical, psychological, and environmental factors that characterize each individual. A frail individual with low resilience is more likely to fall into a disabling cascade and quickly develop negative outcomes, whereas high resilience may be protective and facilitate maintenance of health status [2].

Measures of mobility in older adults are often used as indicators of health and general functioning. Some studies suggest the role of mobility as a predictor of different functional impairments; others researchers attempt to understand how demographic, biomedical, psychological, sociological, or environmental variables are predictors of mobility [3].

The most used approach of frailty was until now the physical frailty. Well-known studies as the Cardiovascular Health Study (CHS) and the Women's Health and Aging Studies (WHAS) evaluated physical frailty using the Fried phenotype.

In 2013, an international consensus group formed by IANA (the International Academy of Nutrition and Aging) and IAGG (the International Association of Gerontology and Geriatrics) defined the cognitive frailty concept as *„a syndrome characterized both by physical frailty and cognitive impairment, in absence of dementia"* [4]. Cognitive frailty appears in the context of the reduced neurophysiological reserves. Many studies have demonstrated that poor baseline physical performance results in cognitive impairment or dementia. And neuro-

imaging studies of cognitive networks showed that regular exercise improves connectivity and increases neuroplasticity which translates into better learning skills [5].

The possible link among physical frailty, cognition and chronic inflammation was directly confirmed by some studies. The IANA-IAGG consensus suggested biomarkers, such as inflammatory markers [i.e., C-reactive protein (CRP) and interleukin (IL)-6, that may be able to capture both the risk of future physical and cognitive declines] [6].

An important factor that also may influence the risk of becoming frail in later life is the personality. There is evidence that the personality may be associated with individual differences in physiological processes that have been hypothesized to underlie the onset of frailty, namely inflammation and the dysregulation of Hypothalamic–Pituitary–Adrenal (HPA) Axis [6].

According to WHO, major depression will become the leading cause of disability worldwide by the year 2030 [7]. It must be also emphasized that, in later life, depression represents a severe public health problem, associated with high rates of suicide and dementia. So, recently the depressive frail phenotype was proposed, being a high-risk morbidity and mortality syndrome and revealing a confluence between depression and frailty [6].

The authors discuss two general hypotheses regarding the medical causes of depression linked to effects of some common chronic disorders in late life: one suggests that depression may be associated with subclinical cerebrovascular disease in older patients with cerebrovascular risk factors; the other suggests that depression occurs in association with conditions related to cytokine-mediated "sickness behaviour" [8].

Cytokine levels are elevated in the blood and cerebrospinal fluid of MDD (major depression disorder) patients. Blocking cytokine actions in patients exhibiting MDD shows some antidepressant efficacy [9].

Similar to the cognitive frailty, for the depressive frailty phenotype a parallel can be made between physical frailty and the domain of brain function. It is known that depression and physical frailty share several clinical characteristics such as loss of energy, fatigability, poor sleep and reduced interest.

Related to the personality, the notion of behaviour is important for the concept of social frailty. The age-related accumulation of deficits is influenced by the individual's behaviors as well as social and economic factors (e.g. access to health care) to which the person is exposed during his or her life [2]. The article "Twenty Years of Research on Cytokine-Induced Sickness Behavior" (2006) shows the following: *"Cytokine-induced sickness behavior was recognized around the 1990s. It was subsequently shown that physiological concentrations of pro-inflammatory cytokines that occur after infection act in the brain to induce common symptoms of sickness (loss of appetite, sleepiness, withdraw from normal social activities, fever, aching joints and fatigue). This syndrome was defined as "sickness behavior" and is now recognized to be part of a motivational system that reorganizes the organism's priorities to facilitate recovery from the infection" [10]*. Sick animals often withdraw from social interactions; their behavior depends on many factors, including the degree of cytokine activation. The complex relations between sickness and social processes suggest that cytokines have many roles in mediating social behaviour that are not limited to situations of pathogen exposure [11].

Social frailty, the most unexplored frailty concept, can be defined as a continuum of being at risk of losing, or having lost, social and general resources, activities, or abilities that are important for fulfilling one or more basic social needs during the lifespan [6].

At the highest level of frailty, the assessment scales consider that the subject is dependent on the surrounding caregivers. This fact highlights the social aspect of frailty since the person progressively loses the autonomy. The healthy ageing model (Fig. 1) presents the frailty as a health characteristic of the intrinsic capacity which permanently interacts with social aspects from the extrinsic capacity. So the social frailty entity can be seen more clearly in a functional perspective.

The model from Fig. 2 shows the frailty in a life-course vision. Xue QL and Fried L et al, consider that an overt state of frailty is preceded by behavioural adaptation made in response to declining physiological reserve (intrinsic capacity). In the intra-individual and environmental domains, in a pre-clinical phase of frailty, there may be adaptive and maladaptive modifications for maintaining of the functional reserve. But such adaptive changes must capture the real function in the real life [12].

One example of such behavioural precursor change is the Life Space, a measure of spatial mobility. It is defined as *"the size of the spatial area people purposely move through, in their daily life, as well as the frequency of travel within a specific time frame"*. As it appears in the model, life space constriction represents a *frailty marker* and it can be influenced by the functional ability components: intra-individual challenges and supports (from intrinsic capacity) and environmental support and challenges (extrinsic capacity). In the Fig. 2, the physiological changes related to age, which can lead to primary frailty, are separated from factors related to chronic physical and mental pathology, generators of secondary frailty. Finally, the risk factors of social frailty can be included in the group of environmental factors: isolation, caregiver gaps, poverty [13].

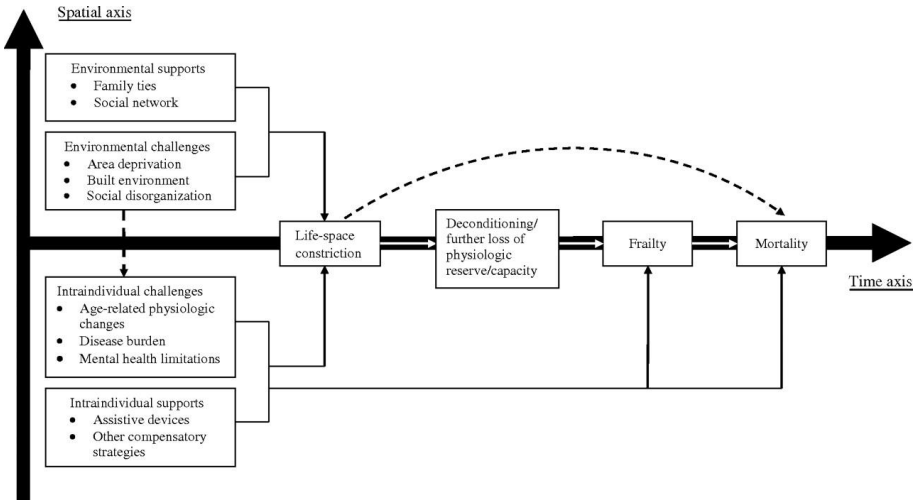

Fig. 2 Theoretical model of the association of life space with the clinical syndrome of frailty [12].
(Solid and dashed lines represent direct and indirect effects, respectively; arrows represent causal direction.)

Based on WHAS-I data (the Women's Health and Aging Studies -the first Study), three-years of cumulative incidence of frailty were analyzed. The authors used the Fried Phenotype criteria in relation to life-space mobility constriction in 599 community-dwelling women, who were not frail at baseline. Multivariate survival-models showed the following: when women who left the neighbourhood four or more times per week were compared with those who left the neighbourhood less frequently, the latter were 1.7 times more likely to become frail. And when the former were compared with those who never left their homes, the latter experienced a 3-fold increase in frailty**.** Xue QL theorized that the LSM constriction is a marker of declines in physiologic reserve. The relation is bi-

directional: the constriction of LSM itself could lead to decreased physical activity and social engagement, accelerated de-conditioning and exacerbated decline in physiologic reserve, directly contributing to the development of clinical frailty [12].
But the study underlines a particularly intriguing idea: "the decreasing of mobility, IADL or ADL alone did not necessarily lead to a reduction in LSM. As reasons for this discrepancy, the authors hypothesize the existence of some external and internal compensatory strategies (e.g., social support and, respectively, using a cane) that may help to minimize the impact on loss of physiologic reserve and preserve LSM" [14].
The same idea was presented in a recent review of researchers from University of Manchester UK (2019): *LSM assessment provides a more complete picture of what a person 'does do' rather than what they physically 'can do', i.e. abilities of a person, assessed by traditional measures as: up and go test or gait speed.* For example, a severely disabled person may utilize a mobility aid and accessible this meaning an extended LSM. But physically able person with dementia or depression may be relatively restricted. The study concludes: the maintenance of an active lifestyle and social participation in older age are fundamental for a good quality of life [15].

The link of LSM with physical and psycho-social component of the index Health Related Quality of Life (HRQoL) was studied in a longitudinal survey from the University of Alabama – Birmingham. The study assessed whether the relationship between functional status (ADLs or what individuals report they are capable of doing) and HRQoL are mediated by LSM (i.e., what people actually do in terms of mobility). Perceived difficulties in performing ADLs were shown to be related to mobility and mobility has also been shown to be correlated with the physical and mental component summary scores of the SF-12 (a commonly used measure of HRQoL). The statistical analyses showed that the mediating role of LSM is more significant linked to the mental component score (MCS) of the SF-12 than the physical component score (PCS) [16].
Our work intends to reveal the links between frailty (measured by LSM assessment) and social and physical functioning.

MATERIALS AND METHODS

The paper studies a sample of 281 patients from the NIGG "Ana Aslan" hospital. They come from two previous studies, one referring on elderly mobility and the other on human longevity. For obtaining significance in the statistical analyzes, only two age groups were used: 45-79 years and 80-98 years, comprising 135 and 146 subjects respectively. Globally, the subjects are evaluated by medico-social survey method, with the application of various tests referring to:

- The physical functioning: Up and Go Test (TUG), ADL and IADL;
- Life Space Mobility (LSM)-assessment;
- The nutritional status (Body Mass Index);
- The psycho-sensorial functioning: depression (Geriatric Depression Scale) and fatigue (Brief Fatigue Inventory);
- The social situation assessment - Geriatric Assessment Wizard (R.Kleindlenst-2001-2002, version 1.3.

The diagnoses are obtained from the clinical department.

RESULTS

Our study uses LSM as a measure of social frailty specially and also of physical frailty, starting from the statement of the UK review (2019): "LSM is a concept that provides a more holistic measure of resilience to physical decline and social isolation in later life" [15].
Following the application of assessment scales, the subjects with a definite frailty diagnosis are dependent (in various degrees) on people who care of them. Thus

the social aspect of frailty is clear. In our lot, the frailty was evaluated mainly by LSM, but in the applied study questionnaire there are also other that mirror the frailty: Up and Go Test and Brief Fatigue Inventory (BFI). Table I shows the frailty weights resulting from these assessments, which imply the need for social support and, therefore, the existence of social frailty*:* 27.5% frails from LSM, 26.6% subjects chronically very tired – a BFI item, and 22.6% frails according to Up and Go Test.

Tab. I Weights of accentuated frailty which imply the presence of social frailty due to decreased autonomy, with dependence on caregivers

Frailty Index	Criteria	Accentuated frailty
LSM	Those >Ill at bed+ > with displacement only in the house + > with displacement near the house	27.5%
Presence of fatigue (BFI)	regular accentuated fatigue	26.6 %
Up and Go Test	Those who can't accomplish the test + those with time execution >20 sec	22.8 %

Regarding the links of LSM with different variables we shall see first the social frailty (A) and secondly the physical frailty (B) level.

A) Links between LSM and social functioning

In some population-based studies, social frailty has been operationalized with single items from functional and depressive symptom scales or health checklist. We recall a recent longitudinal study (2015) which started from the data of the South Australian Health Omnibus Survey (HOS). In 2011, the LSM assessment was included in its questionnaire. Between 2011 and 2014, the data analysis (regarding 3,032 respondents from the community) showed the following: the mean of the LSM score was 98.3 (SD=±20.3) and decreasing scores were associated with: -female gender, -older age, -living in rural areas, -lower educational attainment, - not employed, -lower household income, and -higher numbers of chronic conditions [17]. So, the variables of HOS study which significantly correlated with LSM represent in majority aspects of social frailty.

On the other hand, in NIGG sample, the mean LSM score was 61.6 (SD= ±42.246), much lower than that from HOS survey (Tab. II). The explanation of the difference is the subjects' provenience, HOS survey collecting data from the community and not from a hospital. Also we see NIGG LSM index significantly correlating with some social aspects: age (r= -0.549 /p=0.000), gender, high school graduation (r= -0.146 /p=0.015), social support network and the number of chronic conditions (which is associated with the social aspects due to "sickness behaviour", a quite new syndrome).

Lately, there are more discussions about the psychological frailty which encompasses the concepts of mood and motivational frailty. Regarding (a) the mood, which describes a relative persistent state of emotion, we have mentioned before a recent concept, the depressive frail phenotype [18]. In our study, only in the "80-98 years" group, the link between LSM and depression (GDS) is revealed; the correlation is high (r = -0.374/ p=0.000). On the other hand, speaking about the psychological frailty, there is also the element of (b) motivation, which means: "the drive toward a goal, or lack of a goal (apathy); it is linked to mood but can be largely independent of it as it is noted**,** for example, in nondepressed individuals with dementia".

Tab. II Correlations of the Life Space Mobility assessment with social functioning in the NIGG study

Significant correlations of LSM with:	Total NIGG lot	45-79 years	80-98 years
Gender	ns	r = -0.226/ p= 0.008	ns
Age	r= -0.549 /p=0 .000	r =-0.622 / p=0.000	r = -0.276 / p=0.001
High school attended	r= -0.147 / p=0.014	ns	ns
Caregiver number		r =0.185 /p= 0.032	ns
Number of chronic conditions (high influence on social aspects due to "sickness behaviour")	r=-0.230 /p=0.000	ns	ns
Interest in everyday life	r=-0.222 /p=0.000	ns	r=-0.348 /p=0.000
Satisfaction with the social relations	r=-0.230 /p=0.000	ns	r=-0.206 /p=0.013

In our study, significant correlations were also found between LSM and two social variables, with an important psycho-affective content: (1) interest in everyday life and (2) satisfaction for personal social relationships.

(1) Interest in everyday life: In literature, our "interest in everyday life" item is present in depression assessment scales, but it can also be considered alone as a valuable psycho-social indicator. Considering that motivation arouses interest in various activities, we could analyze the interest for everyday life, for different motivations such as described by a 2015 Finnish article with the title „Personal goals and changes in life-space mobility" [19]. The study explored how personal goals predict changes in life-space mobility in old age. It was observed that: (a) a higher life-space mobility was associated with goals indicating a desire to be active in daily life, to stay mentally alert and to exercise; these associations remained valuable over many years; (b) a high life-space mobility was also predicted by goals related to maintaining functioning; association remained present 2-year later in follow-up; (c) in contrast, lower life-space mobility was predicted by goals aiming improvement of poor physical functioning.

The correlation between the interest for everyday life (for various purposes) and age has a high intensity: r=-0.399 /p=0.000. This link can explain some percents: only 14.6% from the "85-98 years" group are still making plans; and more than half (52.8%) are less interested in everyday life; on the other hand, in pre-senescent group, two thirds subjects are motivated by various activities and under a fifth (18.6%) are less interested in daily problems.

Fig. 3 shows the link between LSM and the interest for daily activities (or motivation) for the entire sample, r=-0.222 /p=0.000 (see Tab. 2). Of those who say that they have different plans, two thirds go outside the town and a not statistically significant percentage stay at home; conversely, of those who have lost interest in various activities, those who go outside the locality represent almost a half of the percentage of the analogous group mentioned above. A third of those stay only at home (30.5%).

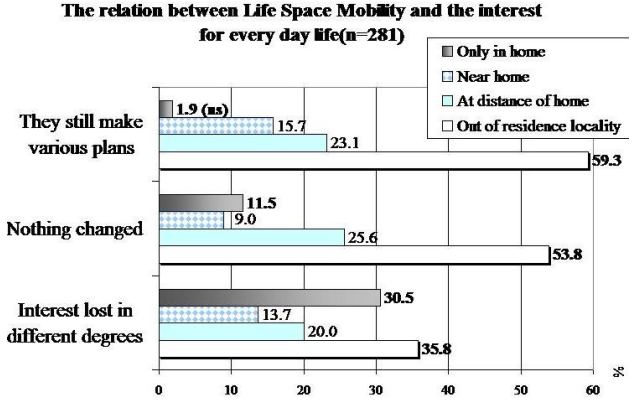

Fig. 3 Links of the Life Space Mobility Index and the interest in daily life (n=281) (r= - 0.222 /p=0.000)

(2) Satisfaction for personal social relationships: The item evaluating the satisfaction with the social relations also has both a social and a psychological meaning. On the one hand, it indicates the existence of a social support network, more or less satisfactory from a quantitative view point; on the other hand it also indicates the quality of the affective load of these connections.

The link between age and the "satisfaction regarding social relations" is strong: r=0.398 /p=0.000. This is the reason for which in the 85-100 years group, only 16.9% are satisfied with their relationships, and more than half (56.2%) feel the limitation of social relations but they resign. Almost a third feels alone and / or disadvantaged.

We can include "the satisfaction with social relationships" in the concept of "attachment", defined as the long-term emotional connection with a particular individual [20]. People have different attachment styles, associated with positive or bad relationships with the others. People characterized by a secure attachment, meaning those who trust the other can be loved, responsive and supportive of their needs, are more resilient to the vicissitudes of life. These people are more optimistic, they make fewer negative assessments about dangers and they are more confident in their ability to face life's challenges.

More recent research shows that attachment style also has an impact on how adults manage to control their emotions in adulthood. Thus, in the lot, the satisfaction with social relationships correlates with high intensity, inversely proportional to depression (r = -0.477 / p = 0.000), but even more with the interest for everyday (r = 0.593 / p = 0.000). This last high correlation between daily interest and satisfaction with social relationships explains why the Fig. 4, the representation of the relationship between LSM and social relations satisfaction, resembles so much the Fig. 3.

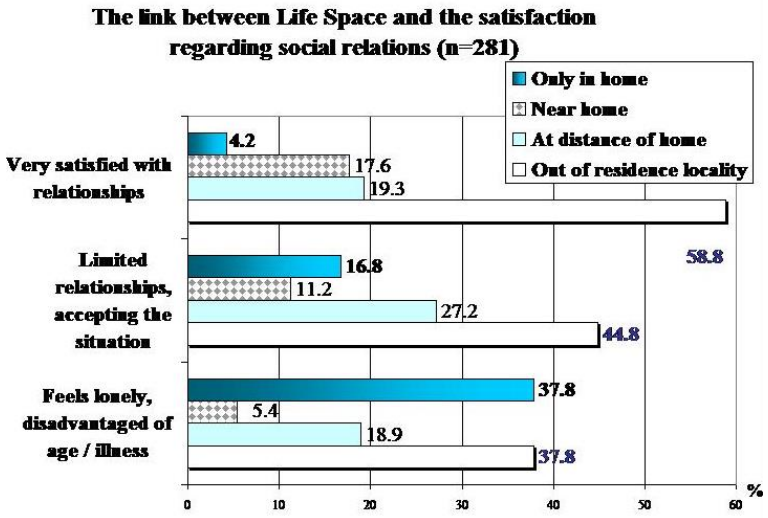

Fig. 4 The links between the Life Space Mobility Index and the social relations satisfaction (n=281) (r= - 0.230 /p=0.000)

B) Links between LSM and physical decline

Starting from the Fried Phenotype criteria, in case of an isolated appearance of muscle weakness, preventive interventions for frailty can be successfully. But if fatigue and / or weight loss had also appeared, it is too late to return to robust health [21]. Both situations are met in our study. First, in the age group "45-79 years", the Life Space Mobility (used as the Index for frailty) correlates only with the test that suggests the low muscle tone and the slow movement (Up and Go Test); but LSM

does not correlate with fatigue and weight loss (BMI) (Tab. III). These mean that muscle weakness is isolated, and that the subjects' health can return to a better status. On the contrary, in the "80-98 years" group, LSM Index correlates with "Up and Go Test", but also with the Brief Fatigue (BFI) Index items linked to general physical activity, walking and with also weight loss (BMI). So, given these circumstances, it is too late for frail subjects to recover to a robust health.

Tab. III The link between frailty (LSM) and Fried phenotype items: Up and Go Test, Fatigue (BFI), weight loss (BMI)

Life Space Mobility Index	Age groups			
Correlated with:	45-79 years		80-98 years	
	r=	r=	r=	p=
Up-and Go Test	-0.168	0.050	-0.308	0.000
Global (BFI) Brief Fatigue Index	ns		-0.265	0.003
BMI	ns		0.183	0.028

CONCLUSIONS

The article places the frailty first in the picture of healthy aging related to the perspectives of functionality and of life course phenomena. Additionally, the paper draws attention to the transitions from a certain health status to pre-frailty (moderate decrease of functional reserve determining behavioural adaptive changes, such as LSM), to frailty and finally to death.

Some data from the literature reveal recent frailty research fields: physical, cognitive, psychological and social. Both the cognitive frailty and the depressive frailty phenotype include elements of physical frailty in their definitions. In our study, we present the links between the Life Space Mobility (LSM) with social variables of functionality and with physical frailty. The social frailty, a little explored frailty concept, can be defined by many criteria. Firstly, we can state that in any kind of frailty, when this condition is accentuated, the person depends on the surrounding help in different degrees, becoming a social frail. In our study, the weights of frailty are 14.1% and 39.7%, in the 45-79 years group, respectively the longevous group.

Secondly, the presence of social frailty is revealed by the links between LSM and some social variables. More precisely, LSM significantly correlates with: age (r= -0,549/ p=0,000), gender, social support network, educational level (r=-0.147/p= 0.014) and chronic diseases number (r= -0.230 /p=0.000) (linked to the "sickness behavior"). All these variables bring to attention components of the social frailty: social isolation, caregiver gaps and poverty.

Third, other aspects of the social frailty are suggested through the significant correlations between the LSM with two social variables that have an increased psycho-affective content: the interest for everyday life (r=-0.222 /p=0.000) and the satisfaction with the social relations (r=-0.230 /p=0.000). Both subjects with a high interest for everyday life, as well as those satisfied with their social relations, have a LSM more extended, traveling at distance from their home in the residence locality and also outside the locality. From the literature we find that the concerns of being active mentally and physically are the reasons which stimulate the interest of the elderly for daily life; these goals correlate with an extended LSM. Also good social relations or, in other words, a secure attachment represents a support for mental health and social adaptation. Those who are satisfied with their relationships are emotionally more attached to their relatives and friends; they want to support them and in turn, they receive support as needed. This interrelation fills their daily existence, giving them reasons to be tonic, active. In our sample, these situations are suggested by the intense correlation between satisfaction for own relationships and interest in everyday life (r = 0.593 / p =

0.000). The mutual help relationships support elderly to be more confident, more optimistic. (See the intense but inverse correlation between relationship satisfaction and depression (r=-0.477 / p = 0.000).
Cognitive frailty and depressive frail phenotype are by definition associated with physical frailty. In our study, the social frailty is also seconded by the physical frailty, being assessed by LSM, a mobility measure. As a conclusion, we can say that the LSM is a valuable method for the assessment of social frailty in particular, but also of frailty in general.

Conflicts of interest

The authors declare no conflicts of interest.

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OCCUPATIONAL THERAPY THROUGH INTERVENTION, RESPONSABILITY AND SOCIAL INTERACTION PROGRAMMES FOR OLDER PEOPLE

*Claudia **Bălan***[1]

[1] *"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania*

Corresponding author: Bălan Claudia, bluegipt@yahoo.com

Abstract. Occupational therapy through social intervention accountability and intervention programs for older persons from Romania represents the continuation and development of the mission which National Institute of Geriatrics and Gerontology "Ana Aslan" has with regards to social gerontology. The pathological characteristic of the older people is represented by polymorbidity, which has to be considered in a psycho - socio - emotional context with a role both as cause as well as effect. The study aims to create a program which includes a series of activities and occupational therapy workshops with a set purpose to intervene in the social, psychological, and environmental factors specific to the elder patients; stimulation of social interaction and interpersonal relations; stimulation, practice and optimization of the cognitive functions; identification and orientation towards managing life problems; recuperation and improvement of motor and coordination strengths; improvements on managing life. The study is based on a questionnaire of needs applied to 200 older patients. Our conclusion confirms the results of previous studies, namely that senior citizens are interested in socializing, interrelating and spending quality time. The social and cultural identity occupies a very important role in the personality structure of a senior citizen and also represents protective factors of the brain.
Key words: occupational therapy, older, social gerontology

Rezumat. Terapia ocupaţională, prin programele de intervenţie, responsabilizare şi interacţiune socială pentru persoanele vârstnice din România reprezintă continuarea şi aprofundarea misiunii pe care Institutul Naţional de Geriatrie şi Gerontologie „Ana Aslan" o are în ceea ce priveşte gerontologia socială. Specificul patologic al vârstnicului este reprezentat de polimorbiditate, iar aceasta trebuie considerată într-un context psiho-socio-emoţional cu rol atât de cauza cât şi de efect. Studiul îşi propune realizarea unui program care să cuprindă o serie de activităţi şi ateliere de terapie ocupaţională, cu scopul intervenţiei asupra factorilor sociali, psihologici şi de mediu specifici pacienţilor vârstnici; stimularea interacţiunii sociale şi a relaţiilor interpersonale; stimularea, exersarea şi optimizarea funcţiilor cognitive; identificarea şi orientarea spre conţinerea problemelor de viaţă; recuperarea şi îmbunătăţirea forţei motorii şi a coordonării; îmbunătăţirea gestiunii vieţii. Studiul are la bază un chestionar de nevoi aplicat pe 200 de pacienţi vârstnici. Concluzia noastră confirmă rezultatele studiilor anterioare, şi anume că pacienţii senescenţi sunt interesaţi de socializare, interrelaţie şi petrecere a timpului de calitate. Identitatea socială şi culturală ocupă un rol foarte important în structura personalităţii vârstnicilor şi reprezintă, de asemenea, factori de protecţie ai creierului.
Cuvinte cheie: terapie ocupaţională, vârstnic, gerontologie socială

INTRODUCTION

Statistics show that the population of Romania, as well as of the whole Europe, is aging. The age structure of the population is characterized by a demographic aging process, caused mainly by a decreased rate of birth, which triggered the absolute and relative decrease of the young population (0-14 years). In parallel, the increase of the life expectancy triggered the increase of the number and proportion of the senior population (65+ years). In Romania, in 2017, 17.4% of the population was aged 65+. In the European Union, in 2017, 19.4% of the population was aged 65+. It is estimated that by 2070 the percentage will get to 51.2 [1].

Currently, according to the statistics made available by World Population Prospects: the 2017 Revision, in 2017 the world's population of over 60 years was in proportion of 13%. The forecasts show that by 2050 this percentage will double, and by 2100 will triple [2].

These aspects raise many economic, social and psychological concerns on the level of the society and public policy. How is the life of these persons, which are the problems they are facing and how happy are the senior persons in Romania?

According to a study conducted by Growth from Knowledge Romania with the help of Margaret Principessa Foundation, in 2015 the main problems faced by the senior persons in Romania were the low income, health issues followed by their dependency on the others, the sense of futility and loneliness [3].

The respondents, 1.5 millions, associated loneliness with the absence of the loved ones (many young Romanians work abroad), living alone, the absence of social interactions and communication and the lack of a constant and practical help. The study also shows that women are more affected than men, and women in the urban are more affected in comparison to the ones in the rural. The loneliness and lack of activity and utility are amplified as they age. To the question what would they improve in their lives if they had the chance, one of three persons answered communication and social interaction.

A senior person faces a series of complex problems, specifically generated both by the age and by different contexts of life: health issues, disabilities, dependency, loneliness, loss of social and professional identity, near-death. In Romania, all these are linked to a deficiency of the social programs for senior persons. Regarding the social services expenses, it may be observed that there are a very low percentage of the social assistance expenses assigned to social services. In 2015, this percentage represented 0.55 of the budget, and the amount assigned to services was decreasing. In 2015, 39% of the amount assigned to services was represented by subventions granted to private suppliers of social services [4].

The idea of an occupational therapy program appeared after the constant affirmations of admitted patients regarding a way to spend the free time: “it would be nice if there were some activities for the admitted patients during weekends”, “it would be interesting if we could see some documentaries about Ana Aslan, on medical topics”. These wishes were corroborated with a series of needs identified within the psychological assessments: weakening or slight and/or moderate deterioration of cognitive functions, many inter- and intrapersonal conflicts, slight to moderate depressive-anxious disorders.

The senior persons are amongst the disadvantaged groups, the majority suffering from loneliness, lack of social interaction to which add up the weakening of the cognitive functions and facing the complex aspects of life and somatic condition [5].

The study aims to create a program which includes a series of activities and occupational therapy workshops with a set purpose to intervene in the social, psychological, and environmental factors specific to the elder patients; stimulation of social interaction and interpersonal relations; stimulation, practice and optimization of the cognitive functions; identification and orientation towards managing life problems; recuperation and improvement of motor and coordination strengths; improvements on managing life.

MATERIALS AND METHODS

Regarding the polling of the interests, motivation and intended degree to participate to an occupational therapy program, we carried out a needs questionnaire (Annex 1) which we applied on 200 patients admitted in the Ana Aslan clinics.

Annex 1- Questionnaire – Occupational Therapy

INGG “Ana Aslan” intends to organize some activities during the free time of the patients, in the form of occupational therapy workshops, aiming to intervene on the social, psychological and environmental factors

specific to the admitted patients and on the stimulation factors of social interaction and interpersonal relationships.
We kindly ask you to answer the questions below by circling the answer that is closest to your personal opinion and by writing examples of activities you would like to carry out as admitted patient.

Annex 1 – Questionnaire – Occupational Therapy			
1.	Are you interested in the organization of a location with daily access, where would be set chess tables, backgammon, play cars, books, magazines, newspapers, and puzzles for adults?	YES	NO
2.	Are you interested in watching movies, documentaries, coverages followed by group talks?	YES	NO
3.	Are you interested in participating to melotherapy sessions? Melotherapy is a form of psychotherapy which uses sounds and music.	YES	NO
4.	Are you interested in participating to cognitive neuro-stimulation workshops? Within these the memory, attention, and abstract thinking are stimulated, optimized and exercised.	YES	NO
5.	Are you interested in participating to group therapy sessions on different topics: inter- and intrapersonal conflicts, loneliness, mourning.	YES	NO
6.	Are you interested in participating to occupational therapy workshops? Within these are performed motor recovery, muscular force recovery and sensitivity and coordination recovery. If you are interested, on which activities would you participate?	YES	NO
	Pottery	YES	NO
	Mold: modelling clay, kinetic sand	YES	NO
	Ceramics	YES	NO
	Bed sheet, apron embroidery	YES	NO
	Whicker braiding	YES	NO
	Bead make-of	YES	NO
	Cooking sweets with no sugar	YES	NO
7.	What other activities would you like to be carried out during your admittance?		
	Thank you!		

RESULTS AND DISCUSSIONS

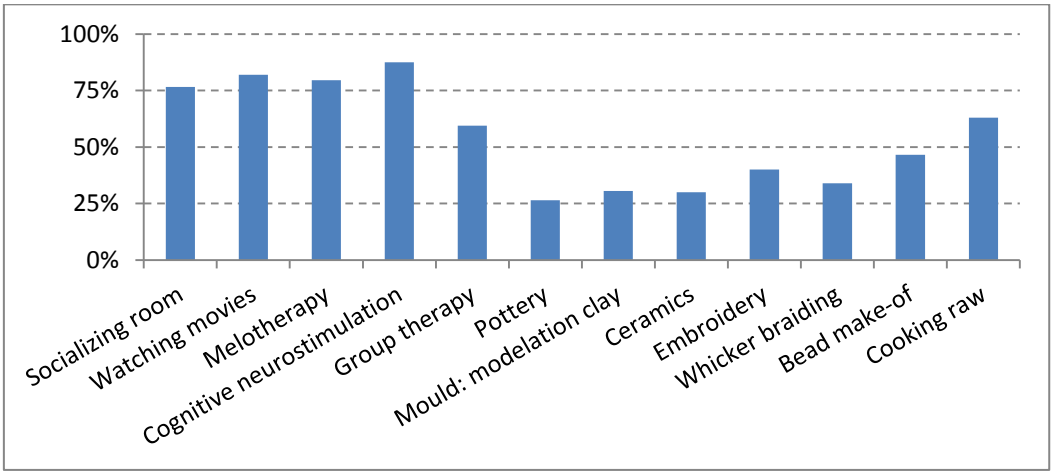

Fig. 1 Choices distribution

Data processing and interpretation (Fig.1) show that the biggest interest was in the idea of some cognitive neuro-stimulation workshops (87.5%), followed by the possibility to watch movies, documentaries (82%), melotherapy sessions (79.5%) and the existence of a location adequate to interrelationships. This data reflect the deepest motivations which a senior person and the admitted patient currently have.

As regards the occupational therapy workshops (Fig.1), the raised interest was moderate to low, the less interesting being the idea of the pottery workshops (26.5%) and the most attractive idea being the one of raw cooking workshops (63%). The explanation consists of the playful aspect of some of these propositions: mold and pottery came up. The relatively increased motivation for the embroidery, ceramics

painting, bead design and raw cooking workshops determined us to include such sessions in our program.

It is found the existence of a relative difference between the activity type chosen and the gender identity. For the accuracy, we delineated the great range of proposed activities in two categories: socio-cognitive activities and occupational therapy workshops. We classified the participation to the socializing room in social-cognitive activities, watching movies, melotherapy and cognitive neuro-stimulating sessions, and the rest of activities in the occupational therapy workshops. Thus, if relating to the social-cognitive activities, no significant differences may be seen, the choices being rather homogeneous, in the case of occupational therapy workshops, the things are otherwise. The females selected all types of themes proposed despite the males who expressed the availability only to three of them, out of seven: plasticine and modeling kinetic sand, rod stitching and cooking healthy sweets.

The extremely low interest expressed towards the occupational therapy workshops indicates a possible stereotype depending on sex (Fig.2). Dynamics of old male patient focuses on the social interaction factors and/or by various kinds of activities, social games 7% higher than the female persons. Socialization is a protective factor of brain operation. In the case of female persons, the selected range of workshops is larger, comprising all kinds of proposed activities. We notice the high interest that the cooking of healthy sweets raised, of 80%, similar to that one generated by the social-cognitive activities. This is in line with the general social trend of eating healthy food and adopting responsible behaviors.

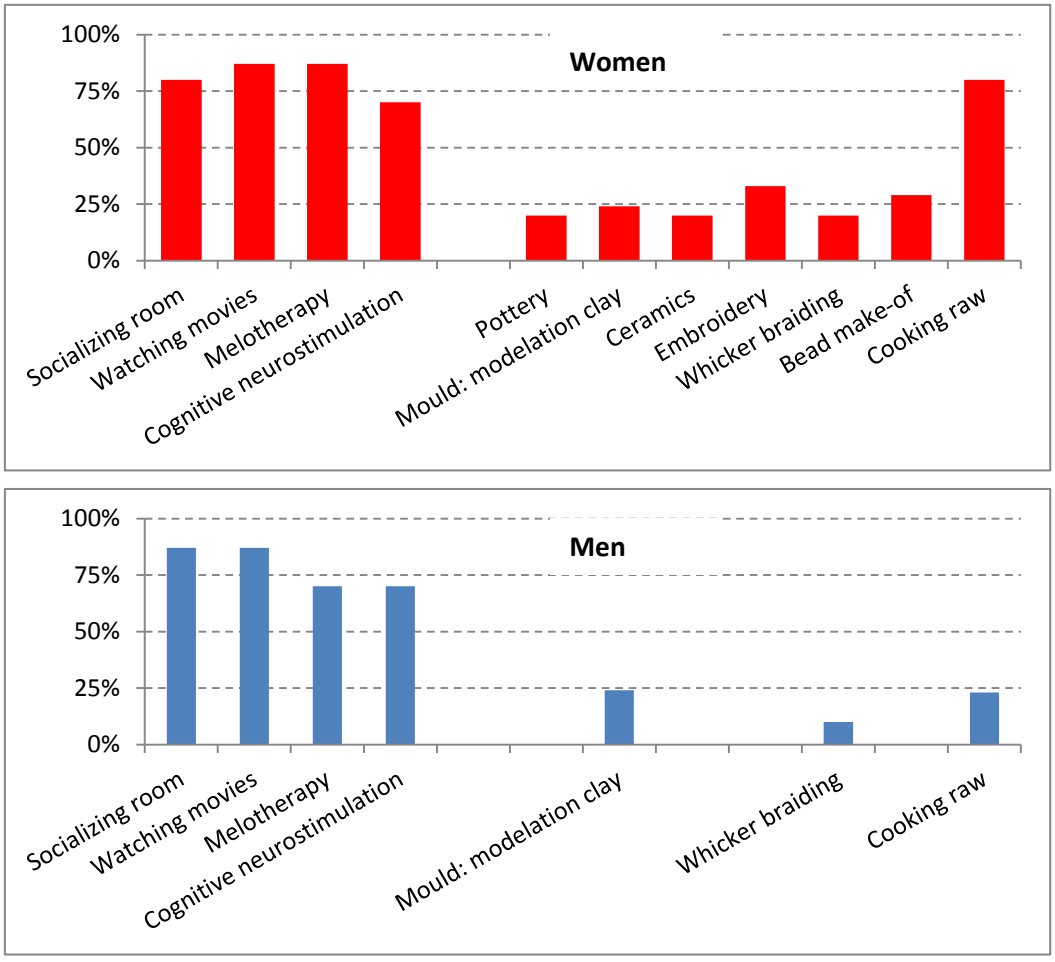

Fig. 2 Gender's choices distribution

Gender distribution shows a highest female to male ratio (Fig.3).

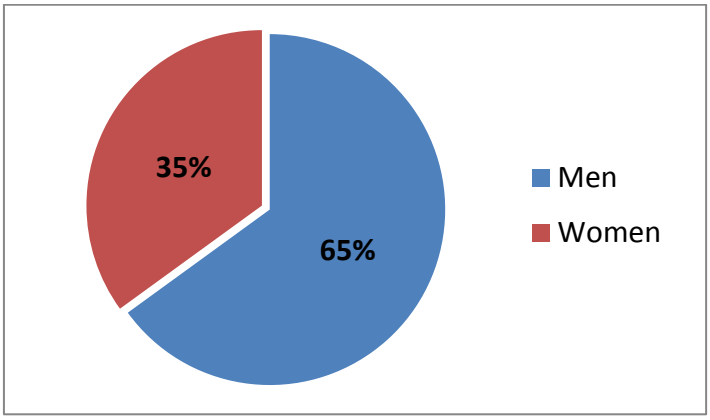

Fig. 3 Gender distribution

The possibility to organize group therapy groups raised a moderate interest of only 59.5% (Fig.1), no matter what gender type was involved. The explanation is being based on embarrassment and social desirability that interfere with exposing the intimate and personal issues in front of strangers. In the occupational therapy program we also include group therapy sessions in order to observe the impact a real plan can have and the contamination possibility by disseminating the impressions of participating.

From the point of view of the variable level of study there is no significant correlation between it and the types of choice made. The same tendency is maintained, respondents regardless of the level of study choosing rather social-cognitive activities and less the various occupational workshops. Distribution by level of education indicates a relative homogeneity among the respondents: 35% of people with higher education, 45% of people with secondary education and 20% of people with low education (Fig.4).

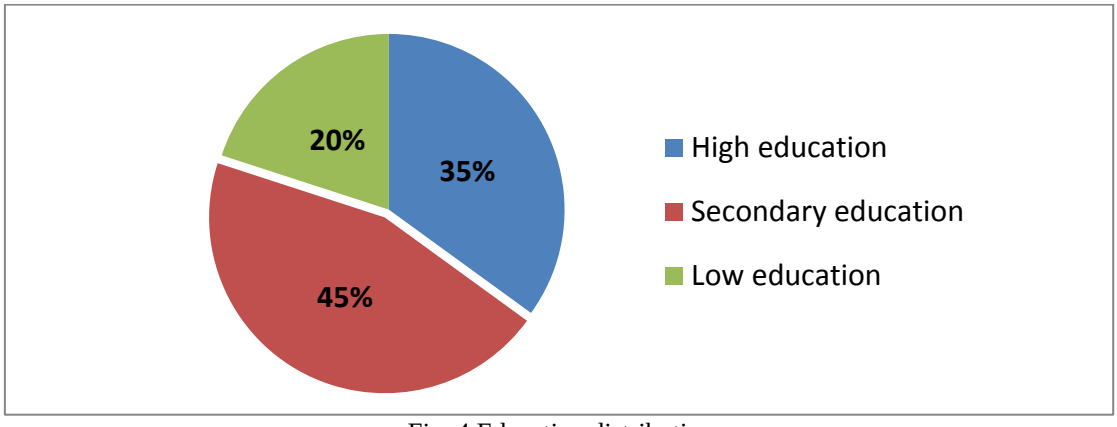

Fig. 4 Education distribution

A correlation was obtained between the variable level of studies and the answers given to the open question on the respondents' personal choices. In order to facilitate interpretation, we categorized the interests stated by respondents in three categories: socio-cultural activities, social activities and practical skills.

People with higher education have suggested that possible activities: organizing theater performances (even with hospitalized patients), meetings with actors, organizing workshops and color contests for adults, dancing, discussions with doctors and people involved in health on various themes, trips around and in

Bucharest, sports activities (swimming, sports competitions), gardening activities. There is a difference in gender identity, in the sense that male respondents have opted for a higher proportion, twice as much for sporting activities than female, 80% vs. men. 35%. Also, women with higher education have shown interest in gardening activities, which is not at all an option for men (Fig. 5).

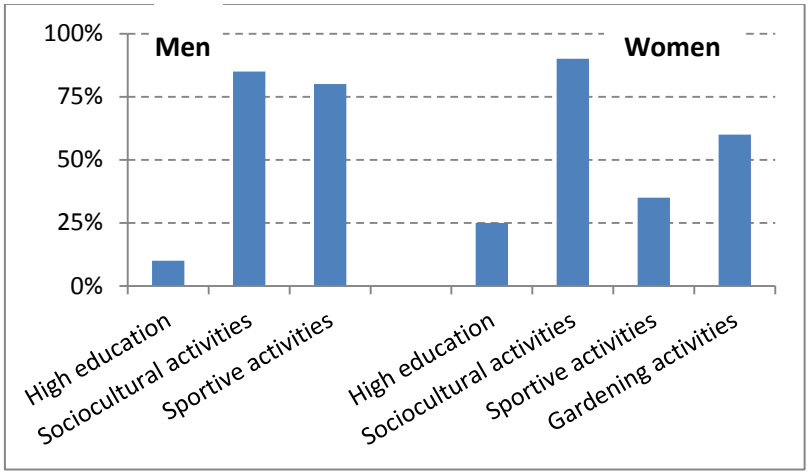

Fig. 5 People's with high education personal choices distribution

People with a secondary education have suggested that possible activities: organizing dance parties, shows, quilting and knitting workshops, workshops for healthy food cooking (not just sweets), gardening (fed flowers) (Fig. 6). There is a stronger trend towards practical activities, compared to people with a high level of education. It maintains, as in the analysis of correlation between gender identity, the higher education level and the manifested interests, the tendency for the female to express their willingness to participate in practical skills. It can also be seen in this case the stereotyped character of the proposed activities, assigned to the social identity of feminine.

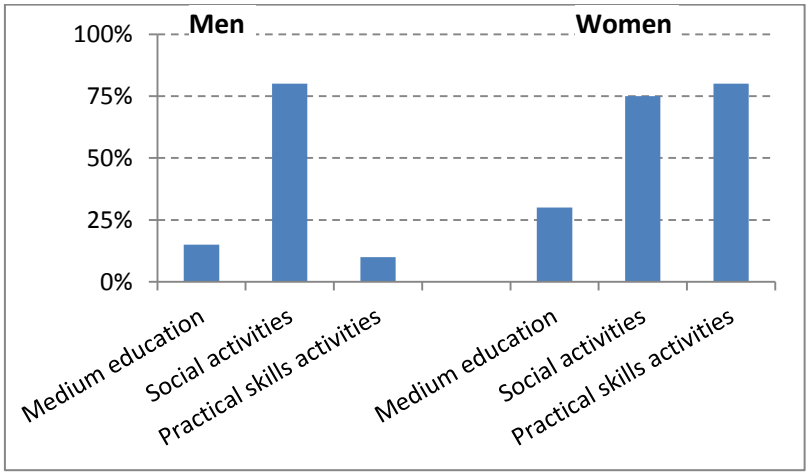

Fig. 6 People's with secondary education personal choices distribution

Low-educated people filled-in lesser the column, almost half did not respond, 8% vs. 12% (Fig. 7). The respondents expressed their interest concerning the organization of a party, knitting and goblet workshops. As in the case of middle-aged students, there is an interest in social interaction and practical activities, but the range of options is much more restricted.

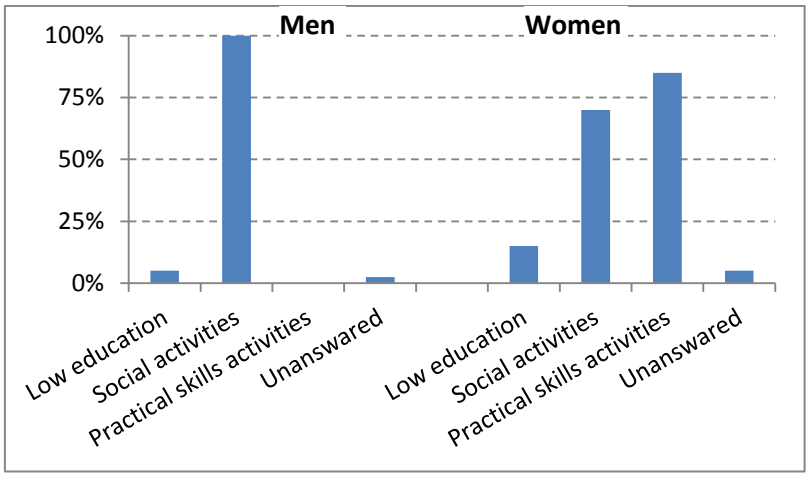

Fig. 7 People's with low education personal choices distribution

The perceived difference is given by the higher interest that people with higher education have for cultural and socio-cultural activities (theater plays, meetings and debates, etc.) and less for dexterity activities. In contrast to these, the other respondents are equally oriented towards activities involving social interactions, especially playful and occupational activities. A high interest has been manifested, regardless of the level of education, for gardening activities.

CONCLUSIONS AND PERSPECTIVE

- Respondents, patients hospitalized with INGG "Ana Aslan" and ambulatory patients over the age of 65 are interested in participating in an occupational therapy program.
- Respondents, regardless of gender, are more interested in participating in activities involving social interaction and psycho-cognitive intervention than in practical training workshops.
- Female respondents have a greater interest in attending workshops of practical skills than males. A possible explanation derives from the existence of gender stereotypes.
- Respondents with higher education, regardless of gender identity, have a high interest in cultural activities and activities involving social interactions and low interest in practical activities.
- Respondents with higher education, male, showed a high interest in carrying out sports activities.
- Female respondents with secondary and low education are interested in participating in activities involving social interaction and carrying out practical skills as opposed to male participants who have shown their interest in social activities rather than in practical activities.
- Respondents, regardless of gender, have a moderate to low interest in group therapy. A possible explanation results by the social desire incurred and the relative novelty of such an intercession.
- The low interest expressed to some suggestions of occupational workshops may be explained by the gender stereotypes, in the game nature related to some of them and the intervention of somatic disorders (sight, rheumatic disorders).
- Respondents are interested in socializing and inter-relating and spending a good time. The social and cultural identities take an important place in their current psychic dynamics.

The extension of study to a representative batch for the entire elderly population of Romania.

Conflicts of interest

The authors declare no conflicts of interest.

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PROFESSIONAL RECONVERSION AND REINTEGRATION OF THE ELDERLY

*Ioana **Găiculescu**[1], Claudia **Bălan**[1]*

[1] *"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania*

Corresponding author: Claudia Bălan, bluegipt@yahoo.com

Abstract. In the near future, the dynamics of old age will look completely different than it does now. According to recent research, the idea of retirement will disappear. The pace of work of a person aged 65 plus will slow down, they will work less, they will change their work profile, explore new areas, but most important, they will be involved in income-generating activities. These trends have led to the development of concepts such as professional reconversion and reintegration of the elderly on the labor market. Starting from these data and corroborating them with the statements of the inpatients of "Ana Aslan" National Institute of Gerontology and Geriatrics (NIGG), Otopeni clinic, regarding the effects of retirement and of inactivity, we initiated a project in order to inform and raise awareness about professional reconversion and reintegration of the elderly into income-generating activities. Following the results obtained from the questionnaire and the discussions with the participants, regarding their interest for professional reconversion and reintegration on the labor market, we are motivated to continue the necessary steps for that project to be successful.
Key words: elderly, professional reconversion, reintegration

Rezumat. În viitorul apropiat dinamica vârstei a treia va arăta complet diferit față de prezent. Conform cercetărilor recente, ideea de pensionare va dispărea. Persoana cu vârsta de 65 ani plus o să încetinească ritmul muncii, o să muncească mai puțin, o să își schimbe profilul muncii de-a lungul vieții, o să lucreze în arii noi, dar o să fie implicat în activități generatoare de venit. Aceste tendințe au dus la dezvoltarea conceptelor de reconversie și reintegrare profesională la vârsta a treia. Pornind de la aceste date si coroborându-le cu afirmațiile pacienților internați la INGG „Ana Aslan", secția Otopeni, privind efectele pensionării și a lipsei de activitate, am demarat un proiect de informare și sensibilizare privind reconversia profesională și reinserarea persoanei de vârsta a treia în activități generatoare de venit. În urma aplicării chestionarului și discuțiilor avute cu pacienții participanți la aplicarea chestionarului, a reieșit un interes pentru reîntoarcerea pe piața muncii și/ sau reconversia profesională, lucru care ne motivează la continuarea pașilor necesari continuării proiectului.
Cuvinte cheie: persoane în vârstă, reconversie profesională, reintegrare

INTRODUCTION

After World War II, the issue of aging has come to the attention of the international community, and has triggered medical and social measures and research and development programs aimed at increasing life expectancy and longevity. At present, life expectancy has increased significantly, and therefore, in 2015, in Western Europe, North America, Canada and Australia, it had reached 80-85 years, and in the African countries, between 50-55 years. Before the 19th century, for the United Kingdom, life expectancy was between 30-40 years [1].

At global level, we are witnessing an increase of the elderly population. According to the statistical data provided by the United Nations Organization, in 2017, the population of the world that was over 60 years old occupied a percentage of 13%. Estimates indicate that, by 2050, this percentage will double, and by 2100, it will triple [2].

At European Union level, in 2017, people over the age of 65 had a weight of 19.4%. It is estimated that, by 2070, it will reach 51.2% [3].

An increasingly older population implies high costs in terms of pension, care and social protection systems, and is determining deeper changes in the way we perceive and approach this stage of life. Many of the modern institutions were built on the idea of retirement. Retirement refers to the period following the interval of time of income-generating activities, before approximately 65 years of age. It is a

period dominated by relaxation activities, which is paid out of the savings and benefits accumulated during the employment phase. Retirement as concept has been developed on a series of elements [4].

At present, 65 years of age does not mean being old and powerless. The 65-year-old person from the beginning of the 20th century is similar to a person who is 75-80 years old at present time. The working pattern has changed; we are not talking that much about physical work, but about intellectual work able to satisfy a person who is over 65. In 2011, in the United States, there were 2 employees who paid taxes of 15,000 $ each to support 1 retired person. The family structure has changed fundamentally, children are no longer living with their parents, single-parent families are more and more numerous, the divorce rate and consequently the rate of single persons has increased. Loneliness, lack of communication and of motivation is associated with mental and physical health problems that increase the costs of health services.

In the light of demographic, medical, technological, social and psychological changes, this creation of the 20th century, retirement, is likely to disappear towards the middle and/or the end of the 21st century. The dynamics of third age, in the future, will look completely different from how we conceptualize it today. Recent researches outline the idea that the elderly will no longer retire. The pace of their work will slow down, they will work less, they will change their work profile during their life, they will work in new areas, but they will continue to be involved in income-generating activities [5].

These changes have begun to occur. New concepts have been developed, such as reintegration and professional reconversion of the elderly. The professional reconversion during the third age implies the partial or total change of the field of activity and it involves a series of stages:

- identify the training programs and the specialized courses that are suitable for the physical, mental and psychic capacities and for the motivations of the concerned person;
- identify job options.

Romania follows the same trend of increase of the elderly population. In 2017, 17.4% of the total population of Romania was represented by people over 65 years old, 15.0% of the total population of Romania was economically active (more than at EU level), and 35.6% lived alone.

Departing from these globally and universally valid statistical data, and corroborating them with the inherent changes that occur in Romanian society, but also with the patients' statements regarding the effects of retirement and the lack of activity, the idea of developing a project was born: to inform about, and raise the awareness on, professional reconversion and reintegration of the elderly in income-generating activities.

METHODOLOGY

In developing our project, we began by selecting the theme: "to what extent the persons of retirement age, between 64 and 75 years old, admitted at "Ana Aslan" NIGG, Otopeni clinic, are interested in resuming professional activity and in taking professional reconversion courses?"

The general goal of the project is "to facilitate the access of the direct beneficiaries to a standardized program of professional reconversion and reintegration", and the specific goals are:

O.S.1: Inform and raise the awareness of the elderly about the processes of professional reconversion and reintegration;

O.S.2: Carry out professional reconversion courses for the elderly

O.S.3: Facilitate the access of participants to courses on the labor market.

The target group is represented by persons between 65-74 years old, retired, from the urban or rural environment.

In order to analyze the knowledge, skills and behavior of the target group, we

developed a questionnaire concerning their needs (Annex 1), and we corroborated the results with the individual interview in order to gather a series of quantitative data regarding the issues involved, and in order to understand the respondents' perspective. The gathered data showed us the extent to which such a project is necessary and welcome. The questionnaire was applied between March - May 2019, to 200 persons admitted at "Ana Aslan" NIGG, Otopeni clinic.

Annex 1 – Questionnaire – Retraining

"Ana Aslan" NIGG is conducting a study on the opportunity of professional reconversion for the hiring of retired persons between 65 - 74 years old. Please answer the questions below by circling the variant that suits you and giving the necessary explanations to the questions, where appropriate.

Annex 1 – Questionnaire – Retraining			
1.	Are you interested in working during your retirement period?	YES	NO
2.	If you are NOT interested, what are your reasons? ……		
	If you are not interested, you can stop here and no longer fill in the questionnaire. Thank you!		
3.	If you are interested, what are your reasons? ……		
4.	Would you be interested in working in the same field that you were active in?	YES	NO
5.	Would you be interested in taking professional reconversion courses?	YES	NO
6.	What are the areas or courses that would appeal to you, should you decide to work again?		
	Computer courses for beginners	YES	NO
	Foreign language courses for beginners	YES	NO
	Babysitter courses	YES	NO
	Cosmetics-facial esthetics courses	YES	NO
	Plumber courses	YES	NO
	Tailoring courses	YES	NO
	Massage courses	YES	NO
	Secretarial-office courses	YES	NO
	Security agent courses	YES	NO
	Decorator florist courses	YES	NO
	Nursing courses	YES	NO
7.	Would you be interested in other areas of activity? Do you have any other proposals?		
	Age: Gender: F/M Environment: R/U Educational level: Financial income: < 1000 lei; 1000 – 2000 lei; > 2000 lei **Thank you!**		

RESULTS AND DISCUSSIONS

The structured questionnaire, as a basic tool for need analysis, is developed following two important directions: the declared interest to work during retirement, and the willingness to attend a series of professional reconversion courses. These courses, and a subsequent employment, represent the goal of impact of the project.

The processing and interpretation of the collected data indicate that 72% of the interviewed patients showed interest in working during retirement, as opposed to 28% who stated that working at this stage of their life was no longer of interest to them (Fig. 1).

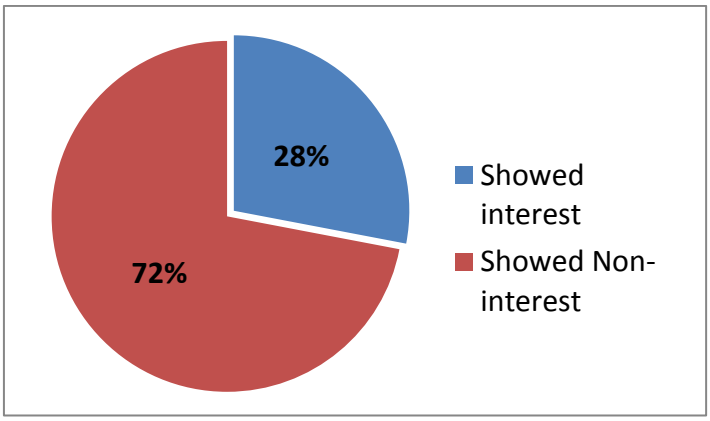

Fig. 1 Distribution of interest

The correlation between the socio-demographic variable and the expressed interest has identified a greater tendency to work of persons coming from the urban environment, compared to those from rural area, but there is high willingness in both environments. Thus, the difference in the urban area is of 78.8% of expressed interest, compared to 21.1% of non-interest, and in the rural area, the difference is of 61.1% to 38.8% (Fig. 2). The higher proportion of non-interest responses may be found in the different dynamics of life in rural versus urban areas. Living in a house with a yard and garden, having animals and solariums involves a continuous work, an aspect that we do not find in the city, living in a block of flats. It must be mentioned that the respondents come to a greater proportion from the urban area, an aspect that may influence the dynamics of the differences.

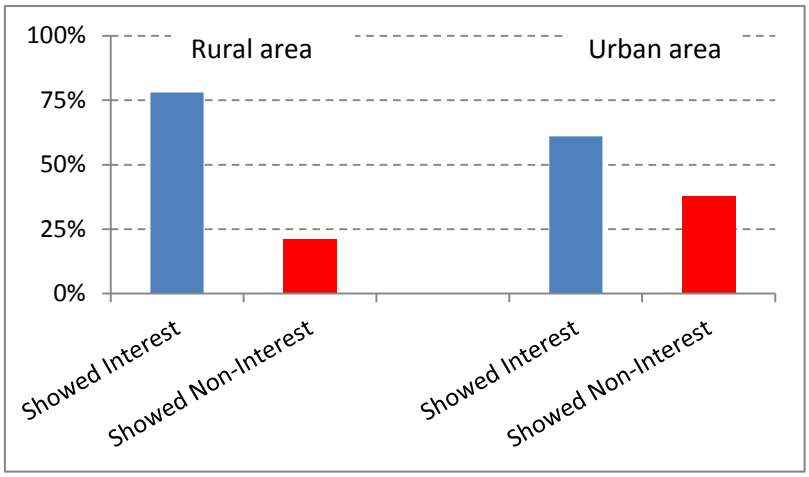

Fig. 2 Distribution of interest per living environments

The correlation between the socio-educational variable-level of education and the interest in working during retirement or not, has helped us collect data that confirm the expressed interest. Thus, we found that, regardless of the level of training, the respondents show a greater interest in working and in taking professional reconversion courses to support this (Fig. 3).

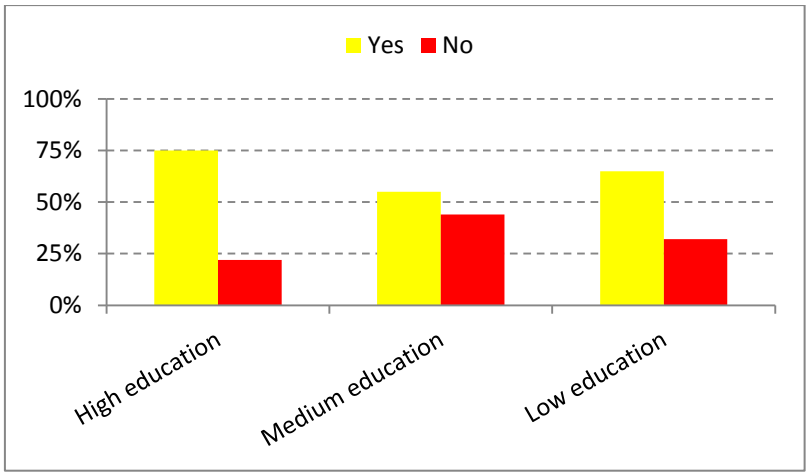

Fig.3 Distribution per educational level

In terms of the gender identity variable, the same tendency could be noticed, but with a greater willingness from female persons to respond positively, compared to males. Thus, out of the total of 30% of the male respondents, 61% responded positively, unlike the female gender, which responded positively in proportion of 77% out of the total of 70% (Fig. 4). The explanation for this fact may be complex, starting from the pension differences between women and men (men have bigger pensions), passing through family status (single women) and reaching the psychological aspects (greater adaptability of women).

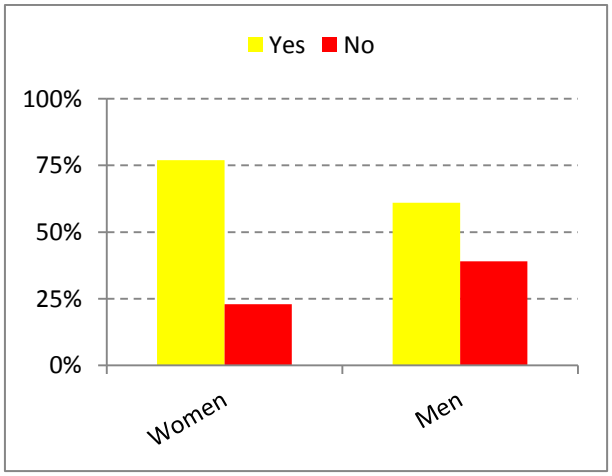

Fig. 4 Distribution per gender

The collected data indicate that, regardless of the educational level, the environment of origin and the gender identity, the respondents show high interest in taking professional reconversion courses and in working during retirement. Moreover, about 96% are interested in such courses even though only 41% of the interested respondents answered that they do not want to work in the field of activity in which they have been active. Regardless of the area in which they will activate, there is willingness to take such courses.

In structuring the questionnaire, we were also interested in the extrinsic and intrinsic motivation that supports their choices. As regards the persons who have not stated their interest in working, the range of reasons includes three motivational types: the good financial status, the time occupied with caring for their grandchildren or their ill partners, and the existence of health problems. All have an approximately

similar impact on the manifested option (Fig. 5). A greater motivational effect is given by the existing health problems. We must specify that the existing questions did not concern their degree of invalidity. A further study might focus on this dynamics in order to capture the difference between the existing invalidity and the perceived invalidity.

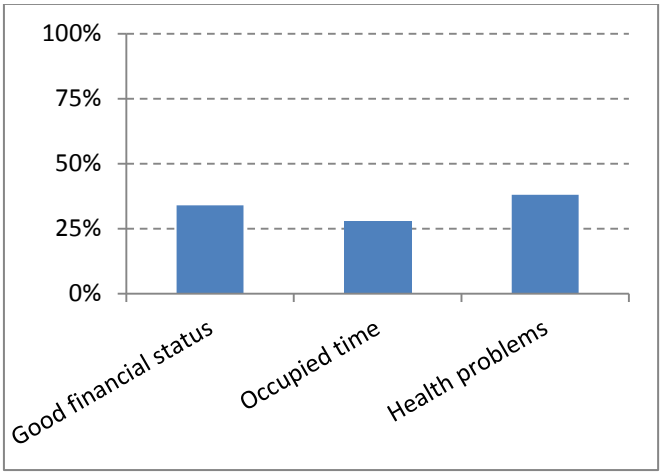

Fig. 5 Distribution of motivational types of persons who declared lack of interest

The motivation based on which the interest to work during retirement has been built consists in two types: the need to occupy their time doing something that matters, and the need for money. The collected data show that the intrinsic motivation is stronger, namely that 59% of the respondents mentioned, as reasons to resume working, the need to give a meaning to life, to occupy their time and to be active. These aspects provide indications about the identity of the retired person, how they perceive this period of stopping to work, what their needs and interests are. It should be mentioned that only 33% of these respondents have material incomes of over 2000 lei. The remaining others earn average incomes between 1000 and 2000 lei per month.

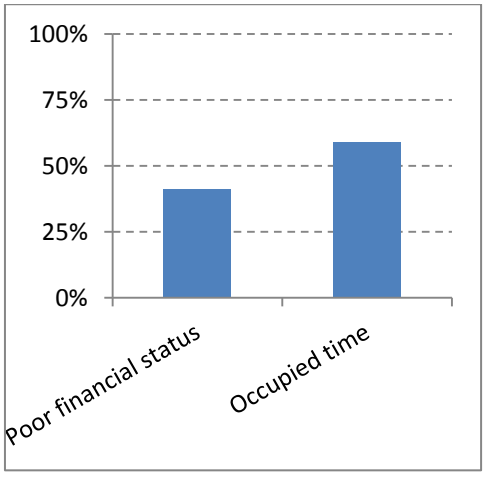

Fig. 6 Distribution of motivational types of persons who showed interest

According to the previous statements, regarding the willingness to take professional reconversion courses, it is a high one, and the respondents showed interest in the proportion of 96%, regardless whether they wish to work in the same field in which they have previously worked or not. The graph of the choices made (Fig. 7) indicates an increased interest for cosmetic courses, in proportion of 27%, and a limited to low interest, of 6-4%, for other types of fields: floral design, tailoring, secretariat, and plumber. A relatively high weight was obtained by computer and English courses for beginners, respectively of 25% and 8%. It should be mentioned that the interest for these two types of courses cannot be associated in practice with getting a job in these fields, as the acquisitions are limited. However, they represent an indicator of the interests and needs that the elderly are manifesting at present.

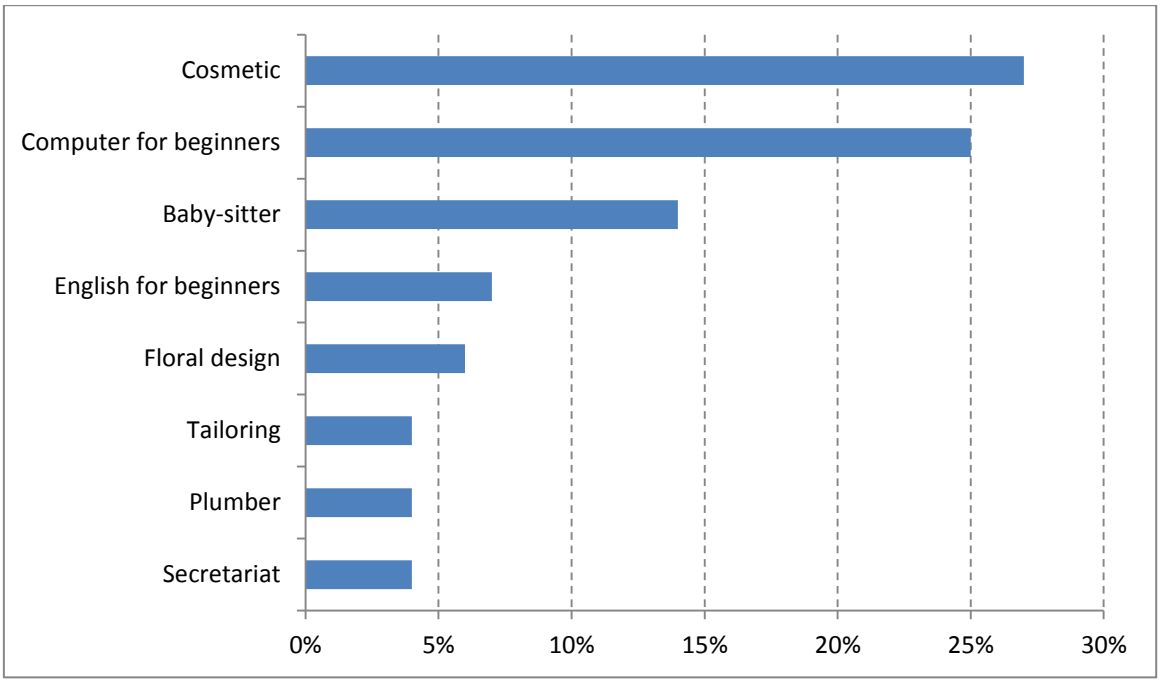

Fig. 7 Distribution of choices

In interpreting the choices made, we acknowledge the existence of gender stereotypes with an influential role. Thus, women predominantly chose types of courses specifically assigned to the female gender - cosmetics, babysitter, floral design, tailoring, while men opted for computer courses (the weight being of 66% M to 34% F), plumber courses. The respondents did not come with personal suggestions regarding the topic of professional reconversion courses.

CONCLUSIONS AND PERSPECTIVE

- There is interest and willingness for not giving up completely on working after retirement.
- There is interest and willingness for taking professional reconversion courses, regardless of the activity field chosen.
- There is interest and willingness for personal development courses in order to acquire modern acquisitions.
- The interest and the willingness are manifested independently of the socio-demographic variables, such as the environment of origin or the educational level. In both environments, the manifest

tendency is of activation. There is a similar situation in terms of study level as well.
- The female gender shows a higher interest in professional activation during retirement.
- The motivation of the stated interest is predominantly given by the need to occupy free time, to do something that matters. It is a type of intrinsic motivation. Money is the secondary motivation.
- The motivation of the stated non-interest is predominantly due to the existence of health problems.
- There is a gender stereotyping of the types of courses for which options have been expressed.

Conflicts of interest

The authors declare no conflicts of interest.

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OLDER PEOPLE IN TECHNOLOGICAL ERA

*Alexandra **Rusu**[1], Rozeta **Drăghici**[1]*

[1] *"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania*

Corresponding author: Alexandra Rusu, alexa0alexandra@gmail.com

Abstract. Starting from Cicero's idea that "older people could give to youngest one from their knowledge and their wisdom" it appears the question "how willing are older people to receive from the knowledge and technological education of young people in order to benefit from advantages of technology in everyday life?" Technology could offer to older people possibility to renew social contacts or to make new ones, to be actively involved in the community they are part of and the most important role of using technology is to create to elderly a sort of independency. The objective of this paper was to verify the opening of elderly regarding the use of technology, their availability to learn new things about technology and to establish the link between quality of life and the use of technology from older people perspective. Methodology: selected subjects for this paper were part from a group of subjects hospitalized at National Institute of Gerontology and Geriatrics "Ana Aslan" with ages between 65 and 90 years old, to which a proper questionnaire called TEQ- Technology for Elderly Questionnaire was applied. Following the study, it was concluded that most of elderly people are open to learn how to use technology, understand benefits of using it but it is quite a difficult process and not everyone has the availability to learn more than they already know.
Key words: older people, technology, quality of life, benefits

Rezumat. Plecând de la ideea lui Cicero cum că "oamenii mai în vârstă pot da mai departe celor tineri din cunoștințele și înțelepciunea lor" apare întrebarea "cât de dispuși sunt cei mai în vârstă să primească din cunoștințele și educația tehnologică a celor tineri pentru a beneficia de avantajele tehnologiei în viața de zi cu zi?". Tehnologia poate oferi persoanelor vârstnice posibilitatea de a reînnoi contacte sociale sau de a forma altele noi, de a se implica activ în comunitatea din care fac parte și cel mai important rol al tehnologiei este acela de a-i crea persoanei vârstnice o oarecare independență. Obiectivul acestei lucrări a fost de a verifica deschiderea persoanelor vârstnice în ceea ce privește utilizarea tehnologiei, dispozibilitatea acestora de a învăța lucruri noi legate de tehnologie și stabilirea legăturii dintre calitatea vieții și utilizarea tehnologiei din perspectiva persoanei vârstnice. Metodologie: subiecții selectați pentru această lucrare au făcut parte dintr-un loc de subiecți internați la INGG "Ana Aslan", cu vârste cuprinse între 65 ani și 90 ani, cărora li s-a aplicat un chestionar propriu denumit TEQ- Technology for Elderly Questionnaire. În urma studiului efectuat, s-a concluzionat faptul că majoritatea persoanelor vârstnice au deschidere pentru a învăța să utilizeze tehnologia, înțeleg beneficiile pe care le au în urma utilizării acesteia, însă este un proces destul de greoi și nu toți au disponibilitatea să învețe mai mult decât știu deja.
Cuvinte cheie: persoane vârstnice, tehnologie, calitatea vieții, beneficii

INTRODUCTION

"Older people could give to youngest ones from their knowledge and their wisdom", said Cicero, but how willing are elderly people to receive from the knowledge and technological education of young people in order to benefit from advantages of technology in everyday life? [1] As the person is growing old, bio-psycho-social changes begin to occur. Most frequent and most visible are usually biological, among which we can mention sensory senescence [2]. It appears constantly and it is felt by decreasing visual and auditory acuity, tactile, olfactory and taste sensitivities. There are a number of psychological changes that can occur during this process like diminishing attention, memory reduction, frequent returns in the past to long acquired experiences [3]. It decreases the spontaneity of thinking but synthesis, generalization and schematic functions are even preserved. Language reflects difficulties of thinking; the verbal flow decreases and it appears a slowness of rhythm and vocabulary. Also, affectivity is disturbed, most frequent being depression and anxiety. All of these personality changes reflect present deterioration. The social status is changing, too, including the circle of friends as well as their activities. There are no longer socially involved in

activities avoiding meetings with close friends because of the fear of being rejected or because of the fear of new things [3].

Because the standard age for retirement in Romania is 63 years old for women and 65 years old for men, an age in which most of the people are still active, it is important for them to supply their physical and mental activity during work days, through other methods [4]. Technology could offer to elderly people the possibility to renew social contacts or to form new ones and to be actively involved in the community they are part of. Because in generally after the retirement everything became a routine, technology could prevent social isolation of elderly [5]. Another important objective of using technology is to create to elderly a sort of independency. Older people could use technology to communicate with close persons, with medical personnel if any medical condition occurs, to be informed about daily events, to relax, but last but not least to keep their memory by training it.

When talking about elderly - meaning 65 years old according to WHO, we cannot speak about homogeneous group [6]. There are major differences between a 65 years old person who is still active or just retired and has contact with technology and an 80 years old person who did not use technology or technological devices and even more, consider himself/ herself too old for starting now to use technology. Also, it occurs some characteristics of elderly personality like suspicion, rigidity, interpretability which can make the process more difficult [7]. Older person lives more in the past than in the future, fact which leads to a psychological isolation, a more distant attitude even aggressive towards other people. Older people tend to be more conservative and it is pretty difficult for them to understand that even there are new things; it could be beneficial for them. It is difficult enough for them to accept that even they have an old age; there are a lot of things that they could learn from younger people who are more experienced in technology. There is also a feeling of embarrassment towards the person who tries to help them with technology because often technically means speeds and accuracy and most of the elderly begin to show changes in the motor-sensory plan – they become more weaker, more insecure, more rigid in the movements, slower in generally.

The reason why I chose this subject for the paper is that I personally consider it very important for the elderly to have a minimum of knowledge regarding the use of technology, because there are many devices designed to alert in case of changes in health, in case of natural disasters and the elderly must know how to access such a warning message. Moreover, every home appliance requires a minimum of technological knowledge for the recognition and understanding of the various warnings: sound, light, color. It exists also devices developed for permanently monitoring elderly and for transmitting to their family's warnings about leaving home, changes of their health status, even falls or administrating medication. Assistive technology is mainly used to facilitate the daily life of both elderly and their family members and to increase the quality of the user's life [8]

MATERIALS AND METHODS

The purpose of this study is to verify the interest of older in the use of technology in their daily lives in order to increase the quality of their life, which is one the objectives of AAL projects ("Active and Assisted Living" Program). The objective of preliminary study was to verify the opening of the elderly in the use of technology, the availability of elderly to learn new thing about technology and to establish the link between quality of life and the use of technology from the older person's perspective.

There were three hypotheses for this study:

I. First hypothesis assumes that most of older people use a technological device like mobile phone, tablet, laptop or

personal computer. II. The second hypothesis assumes that older people are willing to learn to use technology. III. The third hypothesis assumes that older people who were questioned consider that technology could change their quality of life. All subjects were evaluated from the gerontopsychological point of view and then it was applied a questionnaire named TEQ –Technology for Elderly Questionnaire, which contains 10 questions about using technological devices, having fixed or mobile internet, the purpose of using the internet and a personal opinion about technology in relation to quality of life. The study was conducted on a total number of 65 subjects, older people hospitalized at National Institute of Gerontology and Geriatrics "Ana Aslan", with ages between 65 and 90 years old, and the age average being 73 years old.

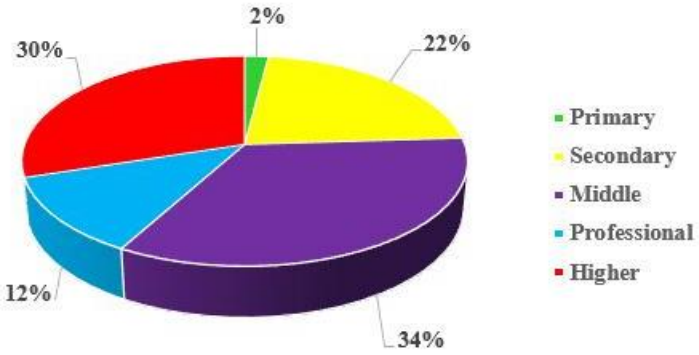

Fig. 1 Subjects distribution by residence area

The distribution of subjects by gender, residence area and educational level was as follows:

- 20% of subjects were males and 80% of them were females
- 29% of subjects came from rural area, while 71% came from urban area.

Educational level was divided into five categories: primary, secondary, middle, professional and higher education. Most of questioned subjects representing 39% from total have middle education.

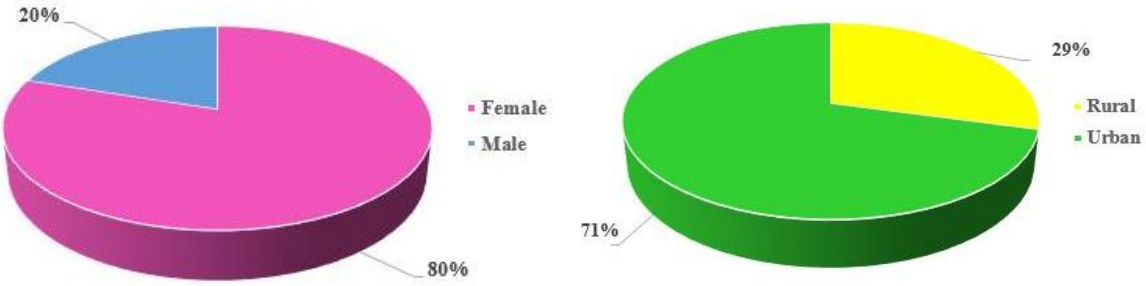

Fig. 2-3 Subjects distribution by gender and by residence area

RESULTS

The first hypothesis was tested with questions 1&2 from TEQ: *1) Do you use a mobile phone?*; *2) Do you use personal computer, laptop or tablet?*. This hypothesis was partially validated because 95% of subjects use a mobile phone but only 38% use a personal computer, tablet or laptop.

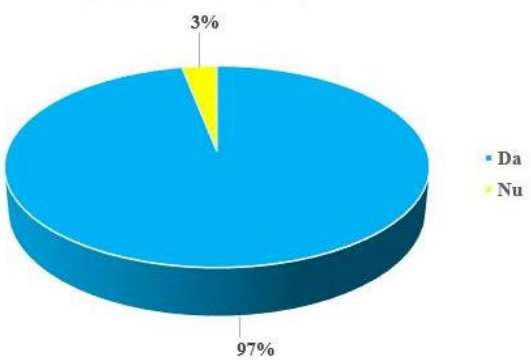

Fig. 4 Answers for question Q1

The second hypothesis was tested with question 7 from TEQ: *7) Would you be willing to learn to use technology?* It was validated with 58% of affirmative answers.

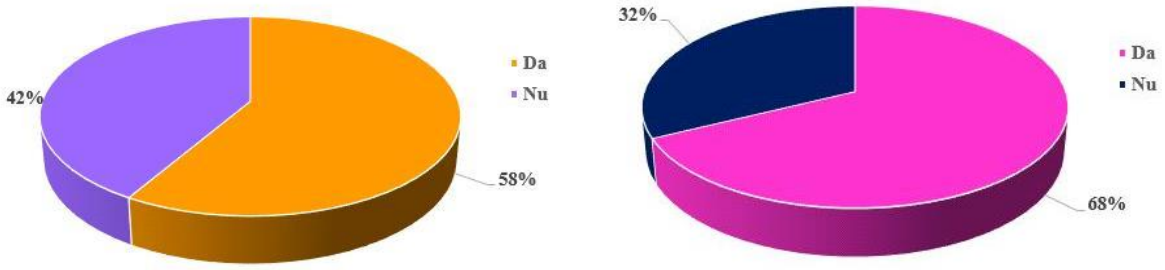

Fig.5-6 Answers for question Q7 and Q10

The third hypothesis was tested with question 10 from TEQ: *10) Do you consider that technology could change your quality of life?* 68% of total answered affirmative which means that the hypothesis was validated.

DISCUSSIONS

The distribution of subjects according to gender is heterogeneous, the number of older women being greater than older men because there are hospitalized more women than men and demographically the ratio is in favor of the female gender. Also, the distribution of the subjects according to the residence environment is hetero-geneous, the number of subjects in the urban area being greater than those in the rural area, because during the application of the questionnaires subjects selected for the study were predominantly from the urban area. Being a small number of subjects, this result isn't relevant for the interpretation of using technology by persons from both areas. Although results of this study were positive, there are many limits about using technology among older people.

According to the technical data of smartphone devices, the response time in adults on reaching an icon on the screen of the mobile phone is 0.7 seconds, while a person over 65 years old has a response time of 1 second. Using a touchscreen device may be a natural thing for a young person, but for an elderly it may be a challenge for the more open-minded or a stressful element for those with motor disorders or a rigid personality [9]. For an older person touching a screen can be a difficult task because the nerves of fingers become more sensitive with aging, which means that older people would press much harder on the screen [10].

Studies have suggested that if an elderly has a slight tremor of the hands, his/her

movement on the touchscreen will be recorded as a slide on the screen rather than a touch of it [11]. Also, another important problem is the font size and the size of the device itself. Elderly need a large, legible writing and color codes, whether it is a mobile phone, tablet or laptop. The device's system must be intuitive, otherwise will be quite complicated for elderly to remember all steps that have to be taken to access various applications. Because older people tend to lose their patience quickly when it comes to things that they hardly understand, stimulating curiosity is a good solution for them – if used applications are linked to a hobby, ability or a pleasure of them, it will be easier to accept and to use it.

To have a successful process of learning how to use technology it is recommended to do gradual exercises with them to acquire certain skills. Regarding the psychological aspects of the elderly, a rigid person in accepting the use of technology will be rigid in accepting everything that is new: hearing aid if necessary, mobility aids, even a companion if needed.

CONCLUSIONS

Following the study, it was concluded that most elderly people are open to learn how to use technology, understand the benefits of using it, but it is quite a difficult process and not everyone has the availability to learn more than they already know.

Conflicts of interest

The authors declare no conflicts of interest.

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INSTRUCTIONS FOR AUTHORS

MANUSCRIPTS. Manuscripts must be written in English and is necessary to contain genuine material. All manuscripts are submitted online, Word Doc, with all figures, references, figure legends and tables in the same document. Will be used Times New Roman font 12 and 1.0 spacing throughout. Acceptable formats for pictures, photos, and figures are JPG or TIF.

TITLES AND AUTHORS´ NAMES. The manuscript will contain a page with a concise and descriptive title (12 words recommended), Times New Roman font 12, upper case, bold; in English, as well as Romanian version. This page will include also the following information: first name and name (bold) of the authors, without their professional and/or scientific degrees, including their affiliations, Times New Roman font 12, italic. Affiliations should be specified by numbers and not symbols (e.g. [1]"Ana Aslan" National Institute of Gerontology and Geriatrics, Bucharest, Romania, [2]"Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania). If all authors were main authors and so, had equal contributions to the paper, then the authors should be listed in a subtitle, in alphabetical order, followed by their contact e-mails. The corresponding author and his contact e-mail must be written just after the institutional affiliations.

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KEY WORDS. In the bottom of each abstract version, should be added three to five key words.

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