Acta Salus Vitae, Vol 8, No 1 (2020)
ISSN 1805-8787 actasalus@palestra.cz

EVALUATION OF QUALITY OF LIFE OF SENIORS WITH DEGENERATIVE SPINAL CORD DISORDERS

Bartosz BOLACH, Marta STĘPIEŃ-SŁODKOWSKA, Eugeniusz BOLACH, Zuzana KORNATOVSKA

Abstract
The goal of the research was to assess the quality of life of the seniors with degenerative spinal disorders. The research was conducted on 71 seniors with diagnosed degenerative spinal disorders, among them 33 women (46%) and 38 men (54%). The age of the subjects was in the range from 60 to 75 years. The questionnaire SF-36 was used to evaluate the indicators of the quality of life. Spinal degenerative disorders had the biggest impact on the general sense of wellbeing in monitored seniors. They lowered vitality level and hampered physical activities. The least affected was the perceived quality of life in the area of social activities, and the assessment of the quality of life was independent of the subjects' gender.

Keywords
Degenerative spinal disorders; Quality of life; Seniors; SF-36 questionnaire.

INTRODUCTION

Spine diseases represent one of the most common disease syndromes with which patients report to doctors of various specialties (Tate, Forchheimer, Bombardier, Heinemann, Neumann, Fann, 2015). Lack of movement has become the main cause of back pain resulting from the work, lifestyle or ignorance of the ergonomics of effort. It causes more and more frequent degenerative changes of the spine (Klimaszewska, Krajewska-Kułak, Kondzior, Kowalczuk, Jankowiak, 2011). Confirmed by radiological studies, the occurrence of the vertebrae degenerative changes, can be observed in 60-80% of the population after 50 years of age (Szulkowska, Fronczek-Wojciechowska Pieszyński, Adamczewski, Kujawa, 2011).

The degenerative changes of the spine are among the most common disease syndromes also due to the facilitation of living conditions and technical progress. Workplaces, in which the same activities are repetitive, or working for hours in poor ergonomic position, affect the overload of joints and periarticular structures of the spine, which is not adapted to long-term static overloads (Kushchayev, Glushko, Jarraya, et al. 2018).

According to Dziak (2003, p.7): "Extremely complicated is the biomechanical system, which is the spine represents with its core and roots. It works properly only until all components work flawlessly. The dysfunction of any element, even outside the locomotor system and the nervous system, causes dysfunction of the whole, which means discomfort, pain and limitation of movement".

Progressive disease may affect the assessed quality of life. Pain associated with arthrosis and a decrease in performance during daily activities contribute to a decrease in health self-esteem. Thus, determining the quality of life is beneficial, because it allows you to examine the degree of satisfaction with life in a given disease entity (Radziszewski 2008; Carlson, Adams, Yang, Fulton, 2018). Self-assessment of one´s own health represents a subjective value of physical and psychosocial condition, what is referred to as the health indicator of older adults. It depends on many factors, including education, financial situation or relations with the family. Making these assessments is associated with life balance analysis and it is

closely dependent on the patient's psycho-physical condition (Kwapisz and Głowacka, 2008).

ANATOMY OF THE SPINE

The spine is a central axis of the body performing a supporting function, protecting the spinal cord and providing a platform for bone and muscle attachments. (Dziak, 2003). It consists of 33 to 34 vertebrae. They are divided into seven cervical vertebrae, twelve thoracic vertebrae, five lumbar vertebrae, five sacral vertebrae and four to five coccyx vertebrae forming cervical lordosis (lordosis cervicalis), thoracic kyphosis (kyphosis thoracica), lumbar lordosis (lordosis lumbalis) and cross-nodular kyphosis (kyphosis sacrococcygea). The named sections participate in varying degrees of spine movements. The least movable part of the spine is the thoracic segment. The cervical spine has the greatest mobility due to small stems and significant height of intervertebral discs. The lumbar region also has a significant mobility (Ignasiak, Janusz, Jarosińska, 2002).

The spine, constituting the central axis of the body and fulfilling the supporting function, must be durable as well as flexible and movable in many planes. Flexibility is provided by intervertebral discs that connect individual vertebral bodies. Intervertebral discs are also part of the intervertebral joints. Through their structure, they enable specific spine dynamics. Its structure consists of a fibrous ring and atherosclerotic nucleus. The fibrous ring surrounds the atherosclerotic nucleus and is the peripheral part of the intervertebral disc. Its task is to connect individual vertebral bodies into one functional whole, because they allow a small range of movements between the vertebrae. Atherosclerotic nucleus occupies 50-60% of the disc volume. It has a semi-jelly consistency and is a support point for the circle lying above. It performs a cushioning function by transmitting tension evenly to the entire fibrous ring and cartilage plates of the vertebral bodies. It also participates in the transport of fluids between the disc and vertebraes (Dziak 2003). The mobility of individual vertebral vertebrae relative to each other is small, because it has a strong ligament apparatus (Ignasiak, Janusz, Jarosińska, 2002; Aleksandrowicz, 2008, Aleti, 2014).

DEGENERATIVE CHANGES OF THE SPINE

Degenerative changes of the spine, i.e. premature wear, occur due to the sum of overloads and microtraumas. They can affect all spine sections, as they can be primary and secondary, as a result of functional compensation of blocked motor units (Dziak 2003). At the beginning of this process is affected by adverse changes in the intervertebral disc, they can be caused by acute or chronic overloads. The consequence of destructive processes is damage to the intervertebral disc. Congenital malformations of the spine and overloading in physical education also contribute to the development of lesions (Rehor, Kornatovska, 2014; Rehor, 2016). Depending on the severity of degenerative changes, bone outgrowth occurs at the edges of the vertebral bodies, the result is spinal canal stenosis. The degenerative process leads to structural and anatomical changes in the joint. These changes increase over time and are irreversible, causing pain (Haywood, Getchel, 2018).

Degenerative disc disease

Degenerative disc disease begins with damage to the fibrous ring that causes displacement of the nucleus pulposus (Dziak, 2003). As a result of aging, wear or injury, dehydration of the atherosclerosis, loss of its elasticity, relaxation of the fibrous ring and reduction of the height of the intervertebral disc, which loses its cushioning properties. The posterior part of the ring weakens and then breaks, con-

tributing to the displacement of the fragments of the atherosclerotic nucleus towards the posterior longitudinal ligament. Damage to the ring may be so great that the hernia formed narrows the lumen of the spinal canal. In this case, the dura mater and nerve fibres are compressed, giving root pain and increased paravertebral muscle tone (Dziak, 2003). The pressure can puncture the posterior ligament and the fragment of the disc enters the spinal canal. This exacerbates pain. Atherosclerotic testicular prolapse can occur in any part of the spine, but the lumbar section is most at risk. According to research at the University Neurological Clinic of Zurich, among 2941 patients with discopathy, 2914 cases of the lumbar spine were recorded (Dziak, 2003).

Spondylosis and stenosis

Spondylosis - is a syndrome caused by overloading the spine associated with intervertebral disc disease. It arises due to the formation of bone outgrowths on the edges of the stems. Osteophytes form on the sides of the anterior longitudinal ligament. The decrease in the height of the degenerated disc leads to mutual friction of osteophytes, which causes their further increase. Overgrowth, micro-injuries and the patient's age are also conducive to the emergence. Stenosis - this is a bulge of bones towards the lumen of the spinal canal. The lateral canal becomes narrow and leads to entrapment of the root and can affect many levels. As a result of instability or limited mobility at a certain level, overloading of the spine moves to other levels, causes degenerative changes in other intervertebral joints, then multilevel stenosis occurs. The decrease in the lumen of the spinal canal can also be caused by a thickening of the yellow ligament, which gives protrusions from the sides joining the capsule of the inter-processional joints. In combination with osteophytes, it causes compression of the spinal cord or nerve roots. Pain symptoms intensify gradually and are more extended over time compared to discopathy. The characteristic symptoms of lumbar stenosis include: constant or intermittent low back pain, sciatica symptoms, increased pain when standing up and relief of sitting problems, cramps and pain in the calves, and numbness in the lower limbs (Dziak, 2003, Haywood, Getchel, 2018).

Degenerative changes of joints

The process of degenerative changes that occur also applies to intergrowth joints. The dysfunction of the intervertebral disc, which in normal conditions performs a cushioning function, means that loads acting on the spine are transferred to inter-processual joints. This accelerates the wear of inter-process joints, which are not adapted to such pressures (Dziak, 2003). The top of the upper appendix of the lower vertebra moves to the height of the base of the arch of the higher vertebra. The resulting changes cause swelling of the joint capsules and the formation of bone outgrowth on the edges of the joint surfaces. The consequence is a change in the shape of the intervertebral hole and a prominent yellow ligament to the root canal. The vertebral column is the displacement of a higher vertebral circle towards the anterior circle below. The moving vertebrate involves a whole column of vertebrae above. This applies to the fourth, fifth and third lumbar vertebrae. The slipping occurs as a result of breaking the continuity of the arch of the upper joint process. Displacement can also be caused by degenerative changes in inter-process joints (Fig. 1). The top of the upper articular process moves up to the height of the base of the arch above the vertebrae. Adjacent vertebrae move relative to each other which is referred to as degenerative spondylolisthesis. As a re-

sult of the slide, the anatomy of the spinal canal changes, which takes the shape of the letter “S”. Pain is blunt, aggravated by standing, walking, bending and hyperextension. Pain may also appear as radicular, radiating to the limbs and feet, intensifying during coughing and sneezing (Dziak, 2003).

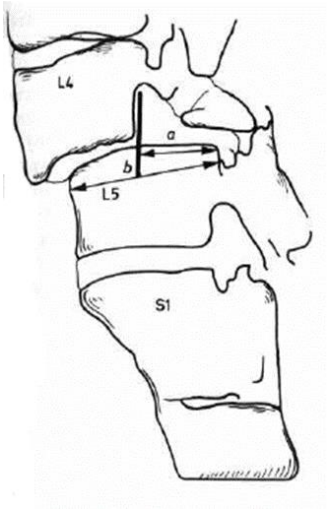

Fig. 1 Degree of displacement of the vertebra relative to the lower body vertebra, side view according to Kiwerski and Kowalski (1997, p. 85)

QUALITY OF LIFE IN ELDERLY

Aging is a reduction in the body's functional reserves that make it difficult to adapt to environmental changes. As a multistage and multi-dimensional process, it takes place over many years and eventually ends in death (Muszalik, Kędziora-Kornatowska, 2009). As a result of this process, the level of physical fitness and endurance decreases, disability occurs. For people at an advanced age, activities such as mobility, personal hygiene, use of the toilet, dressing and self-eating are often very limited. The old age is also characterized by: urinary incontinence, difficulty by moving, by often falls, vision and hearing disorders, which significantly impedes coping with basic activities and is associated with addiction on another person (Kwapisz and Głowacka 2008).

Aging is accompanied by multiple illnesses and the course of the disease is usually more severe than in the case of young people. The progressive disease and hence the pain worsen various aspects of life. Diseases that limit functioning and give you pain have a negative impact on health self-esteem. Living with the disease limits independence of seniors and makes them dependent on other people. This contributes to the lowering of social status, job loss, deterioration of material situation and, consequently, to a lowering of the quality of life (Klimaszewska, Krajewska-Kułak, Kondzior, Kowalczuk, Jankowiak, 2011). Elderly patients make up the majority of those hospitalized. With age, the number of physically disabled people unable to perform daily activities increases. In connection with the demographic decline, it can be observed that the population of seniors is much more numerous than younger people. Factors that increase the level of quality of life among seniors are meeting the need for belonging, opportunities for spending free time and social activity. Adequate healthcare and family contacts are also important. Elderly people living in their own families staying among relatives with a sense of affiliation and with a sTab. life situation show positive results when assessing the quality

of life. In turn, a lower level of satisfaction with life is demonstrated by people staying in a nursing homes, who must adapt to new living conditions and unfamiliar environment (Kwapisz and Głowacka 2008).

OBJECTIVE AND RESEARCH QUESTIONS

The aim of the study was to evaluate indicators of the quality of life of seniors with degenerative changes of the spine using the SF-36 questionnaire.

Research Questions:

1. Is there a difference in evaluation of quality of life in men and women with degenerative changes in the spine?
2. Do degenerative changes of the spine contribute to a decrease in the quality of life in terms of overall health?
3. Do degenerative changes of the spine affect social functioning of seniors?

METHODOLOGY

SUBJECTS

The study included 71 people with diagnosed spinal degenerative changes, living in a senior house, including 33 women (46%) and 38 men (54%). The participation in the study was voluntary and was conducted following the participants' written consent. The age of the subjects ranged from 60 to 75 years, with an average age of 67.2 years and a standard deviation of 4.6 years. Most persons (37%) in the research group had vocational education and the least (17%) tertiary (Tab. 1, Fig. 2).

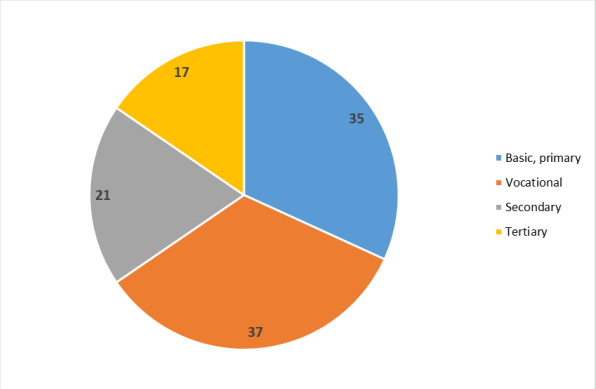

Fig. 2 Educational level of the monitored persons (N=71)

The distribution of education levels of the surveyed women and men was similar (Tab. 1), the chi-square test value was $\chi 2 = 1.56$, which corresponds to the test probability (at 3 degrees of freedom) $p = 0.67 > 0.05$.

Tab. 1 Distribution of the education level of the monitored seniors (N = 71; 38 males, 33 females)

Education	Females		Males	
	n	%	n	%
Basic, primary	7	21%	11	29%
Vocational	11	33%	15	39%
Secondary	8	24%	7	18%
Tertiary	7	21%	5	13%

DATA COLLECTION

The research was carried out using an exploratory technique using the SF-36 questionnaire - Polish version (Tylka and Piotrowicz, 2009). The questionnaire is intended for subjective self-assessment of health. The questionnaire consists of 36 questions regarding various aspects related to quality of life. Answers (scored) to 36 questions allow to define 8 components of quality of life (Tab. 2).

Tab. 2 Quality of life components included in the SF-36 questionnaire

Number	Components
I	PF (Physical Functioning)
II	RP (Physical Role)
III	BP (Bodily Pain)
IV	GH (General Health)
V	VT (Vitality)
VI	SF (Social Functioning)
VII	RE (Emotional Role)
VIII	MH (Mental Health)

In the Tab. 3 there are presented relationships between the components of quality of life and questions in the used Polish version of the SF-36 questionnaire (Tylka and Piotrowicz 2009).

Tab. 3 Components of quality of life in connection with the questions of the Polish version of the SF-36 questionnaire

Number	Components	Question numbers in the Polish version of the SF-36 questionnaire	Score	
			Minimum	Maximum
I	PF (Physical Functioning)	3	0	50
II	RP (Physical Role)	4	0	20
III	BP (Bodily Pain)	7, 8	0	9
IV	GH (General Health)	1, 2, 11	0	24
V	VT (Vitality)	9a, 9e, 9g, 9i	0	20
VI	SF (Social Functioning)	6, 10	0	8
VII	RE (Emotional Role)	5	0	15
VIII	MH (Mental Health)	9b, 9c, 9d, 9f, 9h	0	25

For the purpose of the presented study was the sum of the scores of the first four components determined as the “physical dimension of quality of life”, and the sum of the next four components represents its mental dimension (Tab. 4).

Tab. 4 Two basic dimensions of quality of life created of 8 basic components

Dimensions of quality of life	Definition
Physical	PF+RP+BP+GH
Mental	VT+SF+RE+MH

The maximum number of points related to the physical dimension of quality of life was 50 + 20 + 9 + 24 = 103, while the maximum number of points related to the mental dimension of quality of life was 20 + 8 + 15 + 25 = 68. The

total sum of points of the SF-36 questionnaire could not exceed 171.

Statistical Analysis

Distribution of quality of life scores was assessed by determining mean values, standard deviations and the range of variability, i.e. minimum and maximum values. For comparative purposes, total scores of the quality of life components were expressed as a percentage of the maximal possible sums. With the adopted scoring method, the higher percentage corresponded to the significant reduction in the subjective sense of quality of life. Sex dimorphism in the image of quality of life evaluation was assessed using Student's t-test for independent samples. The test function has the formula:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}} \sqrt{\frac{N_1 N_2 (N_1 + N_2 - 2)}{N_1 + N_2}}$$

where $\overline{X}_1$ i $\overline{X}_2$ mean average values of quality of life assessment in both sex groups, S_1^2 and S_2^2 are variations of this trait in both groups, N_1 and N_2 indicate the numbers of both groups. With the truth of the null hypothesis about the independence of distribution from sexes, the test function t Student's t distribution with N1 + N2 - 2 = 69 degrees of freedom. Differences in the distribution of quality of life assessments in physical and mental dimensions were assessed using Student's t-test for dependent samples. Differences in individual quality of life assessments in both dimensions were expressed as a percentage of the maximum value. The test function was determined from the formula:

$$t = \frac{\overline{d}}{S_d} \sqrt{N}$$

where $\overline{d}$ represents the average difference in the quality of life assessment in both its dimensions, S_d is the standard deviation of these differences, N is the number. The relationship between the incidence of no perceived reduction in quality of life and gender was also compared. For this purpose, a non-parametric Pearson chi-square independence test was used. The test function has the form:

$$\chi^2 = \sum \frac{(n_e - n_t)^2}{n_t},$$

where n_e denote observed (empirical) numbers, n_t denote expected (theoretical) numbers resulting from the assumption of independence of the number of cases of quality of life assessments amounting to 0 points from sex. If the hypothesis that the number of such cases does not really depend on gender is true, then the test function has a Chi-quadrat Person distribution with 1 degree of freedom. Verifications of null hypotheses were carried out at the critical level of significance α = 0.05. All calculations were performed using the STATISTICA 10 from StatSoft (Sobczak, 2007).

RESULTS AND DISCUSSION

RESULTS

The distribution of components´ scores of quality of life (average values, range of variability) in the responses of women and men was similar without significant statistical difference (Tab. 5).

Tab. 5 The average values and the range of variability of scores of individual components of quality of life in the monitored groups of women and men (N=71; 38 males, 33 females)

Components of quality of life	Females			Males		
	$\bar{x}$ [points]	Minimum [points]	Maximum [points]	$\bar{x}$ [points]	Minimum [points]	Maximum [points]
Physical Functioning	29.2	0	48	26.9	0	50
Physical Role	9.8	0	20	9.3	0	20
Bodily Pain	4.6	0	9	3.9	0	9
General Health	17.3	4	24	17.6	5	24
Vitality	12.6	0	20	12.3	0	20
Social Functioning	2.0	0	7	2.1	0	8
Role Emotional	5.0	0	15	5.0	0	15
Mental Health	9.5	0	14	10.8	3	20

Individual assessments of the quality of life elements were clearly varied. With the exception of the general sense of health (GH) in both sexes and the sense of mental health (MH). In the group of men, there were even cases of complete lack of a feeling of reduced quality of life (rating = 0 points). The highest number of cases of lack of perceived restrictions related to emotional problems (element RE; 40 cases, which constituted 56% of the entire research group) or physical health (element RP, 25 cases, which constituted 35% of the entire research group). There were also 17 cases of no decrease of the social functioning, i.e. component SF; which represents 24% of the research group (see Tab. 6).

In the case of these three elements of quality of life (RE, RP and SF) of men were slightly more often not affected by the lack of quality of life, but the gender differences were not statistically significant (in all cases the significance level p in the chi-square independence test clearly exceeded the critical value α = 0.05).

Tab. 6 Cases of no perceived decrease in the quality of life (rating = 0 points) within the components of quality of life according the sex of the respondents (N = 71; 38 males, 33 females)

Components	Females (33)		Males (38=100%)		Sum	
	n	100 %	n	100 %	n	100 %
PF	2	6%	1	3%	3	4%
RP	11	33%	14	37%	25	35%
BP	2	6%	3	8%	5	7%
GH	0	0%	0	0%	0	0%
VT	1	3%	1	3%	2	3%
SF	7	21%	10	26%	17	24%
RE	17	52%	23	61%	40	56%
MH	1	3%	0	0%	1	1%

The average values of the quality of life scoring components were difficult to compare with each other, because the maximum values obtained in each component were different (see Tab. 3). Such a comparison was possible when the average values are expressed as a

percentage of the maximum value in a given quality of life element (Tab. 7). The respondents felt the most the decrease in the quality of life (the highest percentage values) regarding the general sense of health (GH), vitality (VT) and physical functioning (PF). For these quality of life elements, the average rating exceeded 50% of the maximum possible point value (Fig. 3). At the same time, the respondents felt the lowest quality of life in terms of their social functioning (SF). The image of the distribution of the subjective assessment of the quality of life did not show significant dependence on the sex of the respondents.

Tab. 7 Average values of the components of quality of life expressed as a percentage of the maximum possible points value according the sex of the monitored persons

Components	Quality of life evaluation in percentage of the maximum score		
	Females	Males	Sum
PF	58%	54%	56%
RP	49%	47%	48%
BP	51%	44%	47%
GH	72%	73%	73%
VT	63%	61%	62%
SF	25%	26%	25%
RE	33%	33%	33%
MH	38%	43%	41%

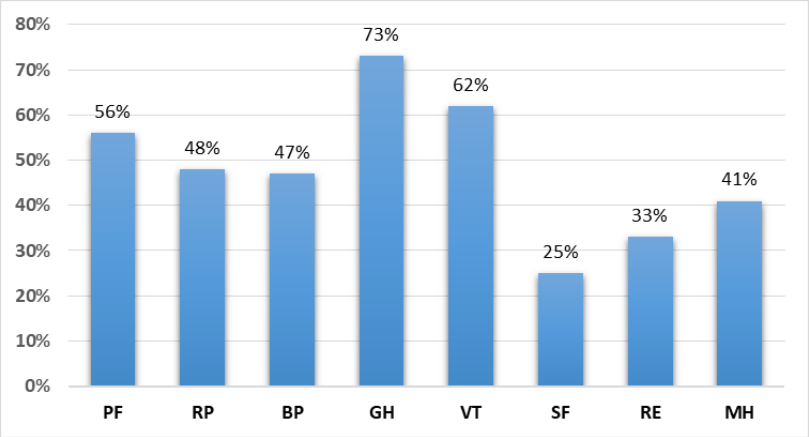

Fig. 3 Average ratings of individual quality of life components expressed as a percentage of the maximum possible points value (both sexes combined) (N=71; 38 males, 33 females)

From detailed assessments of the quality of life within 8 components, collective assessments of two basic dimensions of quality of life can be created: physical and mental dimensions (Tab. 8). The distribution of quality of life evaluation into the two dimensions did not depend on the sex of the subjects, which was confirmed by the Student's t-test for independent samples (Tab. 8).

Tab. 8 Comparison of distribution of quality of life assessments in physical and mental dimensions in the groups of men and women (N=71; 38 males, 33 females)

Dimension of quality of life	Group	$\bar{x}$ [points]	Std [points]	Minimum [points]	Maximum [points]	Student's t-test	
						t	p
Physical	Females	60.9	21.8	4	97	0.66	0.51
	Males	57.8	18.4	5	101		
Mental	Females	29.2	13.3	5	45	0.32	0.75
	Males	30.1	11.6	9	53		

The values of point quality of life scores in physical and mental dimensions could not be compared directly due to differences in the variability of these dimensions. The theoretical maximum assessment of the physical dimension of quality of life was 103 points, and the mental dimension of quality of life only 68 points. The comparison made it possible to express point values as a percentage of these maximum values. The respondents felt a greater reduction in the quality of life in the physical dimension. The difference of feelings in these two dimensions was statistically highly significant, regardless of gender, which was confirmed by the Student's t-test for dependent samples (Tab. 9). Test persons were characterized by a stronger feeling of lowering the quality of life than in the mental dimension regardless of their level of education. However, it could be seen that the greatest difference in average quality of life assessments in both dimensions was found in persons with higher and secondary education (Fig. 4).

Tab. 9 Comparison of the quality of life in physical and mental dimensions, expressed as a percentage of maximal possible score in physical and mental dimensions in the groups of men and women (N=71; 38 males, 33 females)

Group	Dimension of quality of life	$\bar{x}$ [pkt]	Std [pkt]	Student's t-test	
				t	p
Females	Physical	59%	21%	4.53	0.00008
	Mental	43%	20%		
Males	Physical	56%	18%	4.63	0.00004
	Mental	44%	17%		
Sum	Physical	58%	19%	6.43	<0.00001
	Mental	44%	18%		

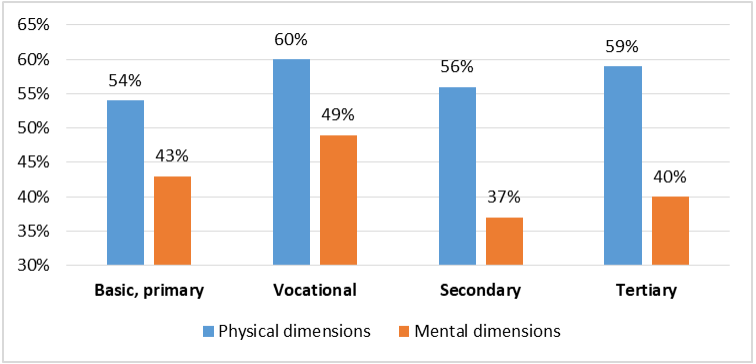

Fig. 4 Average of the quality of life assessments in physical and mental dimensions depending on the level of education, expressed as a percentage of maximal possible score in physical and mental dimensions in the groups of men and women (N=71; 38 males, 33 females)

DISCUSSION

The World Health Organization described the quality of life as the individual's sense of cultural position and value system in which he lives in relation to his achievements, expectations, standards and interests (Hajat, Stein, 2018). According to the authors, the assessment of the quality of life was considered in a subjective dimension and it was the result of evaluating various spheres of life in the context of life as a whole.

Thus, it could be seen that the quality of life assessment includes the degree of satisfaction with life in terms of needs and the possibilities of their implementation. It depended on the individual value system and the degree of satisfaction in such areas as: sense of health, family life, spending free time, education, housing conditions and general standard of living (Klimaszewska, Krajewska-Kułak, Kondzior, Kowalczuk, Jankowiak, 2011; Rehor, 2002).

The quality of life depends on the state of health - health related quality of life (HRQL) and covers four areas: mobility, somatic state, mental and social condition. It assumes that the quality of life assessment depends on health. The worse our health is, the worse our quality of life is (Post, 2014).

Kwapisz and Głowacka (2008) conducted a study among geriatric patients with rheumatic diseases after a spa treatment. The study included 68 people aged 65 to 81 (44 women and 24 men). Among the respondents, the majority of people were over 75 (57 respondents), the remaining 13 people were between 55 and 74 years old. The highest percentage had secondary education (37.1%), and the lowest percentage had higher education (11.4%). The research used the SF-36 questionnaire (Kwapisz and Głowacka 2008). Of the respondents, 48.6% rated their overall health as satisfactory, more than 20% said it was good, and 29.1% as poor. Over half of the respondents, i.e. 54.1% did not report any problems regarding social activity.

Similar results regarding social functioning were obtained in this study. Degenerative changes of the spine among monitored seniors had the least impact on the reduction of the quality of life in terms of social functioning (SF), because the average rating of this component was the lowest value among all elements constituting the quality of life and was 25%. On the other hand, general sense of health was the main element lowering the quality of life rating, because the average rating was 73% of the maximum possible point value.

Grzegorczyk, Kwolek, Bazarnik, Szeliga, Wolan (2007) compared the quality of life of seniors living in nursing homes and attend classes at the University of the Third Age. The study group consisted of 128 residents of the nursing home (83 women and 45 men) and 45 students of the University of the Third Age (40 women and 5 men). The age of the surveyed residents of the nursing home ranged from 56 to 87 years, with an average age of 77.3 years, and students of the University of the Third Age from 56 to 87, with an average of 66.6 years. Nottingham Health Profile scales were used to assess the quality of life, 0 being the worst quality and 100 being the best. Quality of life was assessed taking into account six areas: life energy, pain, emotional reactions, sleep disorders, social contacts and mobility limitations. Residents of the nursing home rated life energy (54.5 points) and physical fitness (56.5 points) the worst. On the other hand, in the students of the University of the Third Age, social contacts (75.5 points) and sleep (59.3 points) were the highest rated component.

Similar results were observed in this study, showing that the residents of

the nursing home felt the worst reduction in quality of life in terms of vitality (62%) and physical functioning (56%), because for these elements of quality of life the average rating exceeded 50% of the maximum possible point value.

Muszalik and Kędziora-Kornatowska (2009) conducted a study among 234 patients (152 women and 82 men) aged 56 to 91 years. The average age of men was 71 years and women 71.8 years. The subjects constituted a group of patients treated at the Geriatrics Clinic. They were people with chronic renal failure, musculoskeletal disorders and after strokes. The study was conducted with the help of the diagnostic survey "Nottingham Health Profile" in Polish version. The questionnaire consisted of two parts. The first concerned six subjective dimensions such as motor skills, life energy, pain, sleep disturbances, emotional reactions and social isolation. The second part covered the impact of health on paid work, housework, social, family and sexual life, interests and use of free time. Most respondents complained about a decrease in life energy (index 0.59). Patients with locomotor system diseases had the most problems with homework, realization of interests and fulfilling free time. There were no significant relationships related to the sex of the respondents.

Similar results were observed in the presented study, as the majority of complaints from the elderly with degenerative changes of the spine concerned the general sense of vitality (62% of the maximum possible point value). There was also no correlation in the assessment of the quality of life for women and men. Muszalik, Kędziora-Kornatowska (2009) conducted a study among 32 residents of the Nursing Home (with chronic diseases) and 28 patients of the Home Hospice Palliative Care Clinic (with cancer) in Piła living with family (26 women and 36 men). The age range ranged from 60 to 90 years, with an average age of 72.7 years. The research tool was the functional assessment questionnaire for chronically ill people FACIT-F and the daily fitness assessment questionnaire (ADL) based on the Katz scale. The research showed that the average value of quality of life assessment for men and women was comparable and amounted to 74.3 and 74.8, respectively. In the studied group, the level of everyday activities was low and medium. On the other hand, the average value of the quality of life assessment for residents of the Nursing Home was lower than among patients of the Home Hospice of Palliative Care living with the family. In this work it was also observed that the decrease in the quality of life was associated with physical functioning, because the average rating of this component constituted 56% of the maximum possible point value.

The quality of life of monitored seniors was affected by a decrease in the level of vitality and thus physical functioning. The decrease in the quality of life had the least impact on functioning in the field of social life and was not dependent on the sex of the respondents.

CONCLUSIONS

On the bases of the analysed and presented results we can determine the following findings:

Deterioration of the general sense of health was the main element lowering the assessment of the quality of life of monitored seniors with degenerative changes of the spine.

Deterioration of the general feeling of health of monitored seniors was associated with deterioration of vitality, which was the second element in turn reducing the assessment of the quality of life of these people.

Degenerative changes of the spine of monitored seniors had the least impact on reducing the sense of quality of life in terms of social functioning.

The reduction in the quality of life of monitored seniors with degenerative changes in the spine was significantly bigger in the physical dimension compared to the reduction in the quality of life in the mental dimension.

The difference between the subjective assessment of the quality of life in the physical and mental dimension of monitored seniors with degenerative changes of the spine was bigger in persons with higher education.

The assessment of the quality of life of people with degenerative changes of the spine was independent of the sex of the subjects.

REFERENCES

Aleti, H. and Motaleb, I. A. (2014) *Study of stress and strain in human spine*. IEEE International Conference on Electro/Information Technology, Milwaukee, pp. 184-189, doi: 10.1109/EIT.2014.6871759.

Carlson, S.A., Adams, E.K., Yang, Z., Fulton, J.E. (2018). Percentage of Deaths Associated With Inadequate Physical Activity in the United States. *Preventing Chronic Disease*. *15*(29)E38. doi: 10.5888/pcd18.170354.

Dziak, A. (2003) *Bolesny krzyż*. Kraków: Medicina Sportiva.

Grzegorczyk, J., Kwolek, A., Bazarnik, K., Szeliga, E., Wolan, A. (2007). Jakość życia osób mieszkających w domach pomocy społecznej i słuchaczy uniwersytetu trzeciego wieku. *Przegląd Medyczny Uniwersytetu Rzeszowskiego, 3*(1) 225-233.

Ignasiak Z., Janusz, A., Jarosińska, A. (2002). *Anatomia człowieka*. Wrocław: AWF.

Klimaszewska, K., Krajewska – Kułak, E., Kondzior, D., Kowalczuk, K., Jankowiak, B. (2011) Jakość życia pacjentów z zespołami bólowymi odcinka lędźwiowego kręgosłupa. *Problemy Pielęgniarstwa, 19*(2) 47-54.

Hajat, C., Stein, E. (2018). The global burden of multiple chronic conditions: A narrative review. *Preventive Medicine Reports, 12*: 284–293. doi: 10.1016/j.pmedr.2018.10.008.

Haywood, K.M., Getchel, N. (2018). *Life Span Motor development*. Ed. 6. Champaign: Human Kinetics. 448 p.

Kiwerski J., Kowalski M. (1997). *Schorzenia i urazy kręgosłupa*. Warszawa: PZWL.

Kushchayev, S.V., Glushko, T., Jarraya, M., Schuleri, K.H., Preul, M.C., Brooks, M.L., Teytelboym, O. (2018). ABCs of the degenerative spine. *Insights Imaging. 9*(2):253-274. doi:10.1007/s13244-017-0584-z

Kwapisz U., Głowacka M. (2008). Samoocena zdrowia pacjentów w starszym wieku po leczeniu uzdrowiskowym w badaniach SF-36. *Balneologia Polska, 15*(3) 140-147.

Muszalik M., Kędziora-Kornatowska, K. (2009). Jakość życia przewlekle chorych pacjentów w starszym wieku. *Gerontologia Polska 4*, (2)185- 189.

Post, M. W. (2014). Definitions of quality of life: what has happened and how to move on. *Topics in spinal cord injury rehabilitation*, *20*(3), 167–180. https://doi.org/10.1310/sci2003-167

Radziszewski K. (2008). Stan funkcjonalny pacjentów z dyskopatią kręgosłupa lędźwiowego leczonych

wyłącznie zachowawczo bądź operowanych. *Wiadomości Lekarskie, 61*(3) 23-29.

Rehor, P. R. (2016). "Yes I Can" Exercise Adoption and Adherence Model. In: Zvonař, M., Sajdlová, Z. *Proceedings of the 10th International Conference in Kinanthropology "Sport and Quality of Life", Masaryk University, Brno, November 18-20, 2015*. Brno: Faculty of Sport Studies Masaryk University. 71-81.

Rehor, P. R (2002). Connection to purpose. *Australian Council for Health, Physical Education, and Recreation Healthy Lifestyles Journal, 64*(2) 134 -145.

Rehor, P. R., Kornatovska, Z. (2013). Measuring of health – related benefits of physical activity in high school students. *Acta Salus Vitae, 1*(2), 148-157.

Sobczak, M. (2007). *Statystyka.* Warszawa: PWN.

Szulkowska K., Fronczek – Wojciechowska M., Pieszyński I., Adamczewski T., Kujawa J. (2011). Porównawcza ocena skuteczność przeciwbólowej wpływu prądów interferencyjnych, ultradźwięków i terapii łączonej obu metod na ograniczenie promieniowania dolegliwości bólowych u chorych z przewlekłym zespołem bólowym kręgosłupa w przebiegu choroby zwyrodnieniowej. *Kwartalnik Ortopedyczny, 4*(1) 436-446.

Tate, D.G., Forchheimer, M., Bombardier, CH., Heinemann, A.W., Neumann, H.D., Fann, J.R. (2015). Differences in quality of life outcomes among depressed spinal cord injury trial participants. *Archives of Physical Medicine and Rehabilitation, 96*(2) 340-348. doi:10.1016/j.apmr.2014.09.036

Tylka J., Piotrowicz R. (2009). Kwestionariusz oceny jakości życia SF-36. *Kardiologia Polska, 67*, 1166- 1169.

CONTACTS

Author correspondent:
Prof. Dr. habil. Bartosz BOLACH, PhD.
University School of Physical Education and Sport in Wroclaw, Faculty of Sports Sciences, Poland
E-mail: BBolach@interia.pl

Co-authors:
Prof. Dr. habil. Eugeniusz BOLACh, PhD.
University School of Physical Education and Sport in Wroclaw, Faculty of Sports Sciences, Poland

Assoc. Prof. Marta STĘPIEŃ-SŁODKOWSKA, PhD.
University of Szczecin, Faculty of Physical Culture and Health, Poland

Assistant Prof. PhDr. Zuzana KORNATOVSKÁ, PhD.
University of South Bohemia in České Budějovice, Faculty of Education, Czech Republic