

# The Assessment of the quality of life and functional status of multiple sclerosis patients

## Ocena jakości życia oraz stanu funkcjonalnego chorych na stwardnienie rozsiane

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### Key words

multiple sclerosis, quality of life

### Abstract

**Background:** Multiple sclerosis is a chronic demyelinating disease of the central nervous system. The patient's state is determined by factors such as the type of MS, the time since diagnosis, family support and many other individual characteristics. The prolonged and progressive nature of the disease leads to a decrease in the quality of life and the gradual deterioration of a patient's functional state.

**Purpose:** The aim of this study was to evaluate the quality of life in people with multiple sclerosis and to determine the relationship between the quality of life and the disease duration, the type of MS and the functional state. The second goal was to compare the questionnaires in order to assess the quality of life in patients with MS.

**Material and methods:** The study involved 35 consecutive patients with a clinical diagnosis of multiple sclerosis. Quality of life was assessed using the SF-36 and MSIS-29 questionnaires. To assess the patients' functional state the Timed Up & Go test, De Souza scale and a 4-test balance scale were used.

**Results:** The mean scores of all subscales of the SF-36 were below the norm in the study group. There was a strong positive correlation between the results of *Physical Functioning* (PF), *Role Physical* (RP) and *Physical Summary Component* (PSC) and the results of the four-step balance scale and the De Souza scale, as well as a strong negative correlation between the PF, RP, PSC and the Timed Up & Go results. The longer the duration of the disease was, the lower the scores assessed on the PF and PSC subscales were.

**Conclusion:** 1. A longer duration of the disease and a worse functional state, lowers the quality of life of patients with multiple sclerosis. It seems that this group of patients requires more support from formal and informal caregivers and institutions within the health care system. 2. A significant correlation between the results obtained in patients with MS in the SF-36 and MSIS-29 questionnaires, suggests that using them alternatively in the assessment of some areas of the quality of life may be justified.

### Słowa kluczowe

stwardnienie rozsiane, jakość życia

### Streszczenie

**Wstęp:** Stwardnienie rozsiane jest przewlekłą chorobą demielinizacyjną ośrodkowego układu nerwowego. Na stan funkcjonalny i psychiczny chorego wpływają takie czynniki jak: postać stwardnienia rozsianego, czas od diagnozy, wsparcie ze strony rodziny oraz wiele innych indywidualnych cech. Postępujący i długotrwały charakter choroby prowadzi z czasem do obniżenia jakości życia pacjentów oraz stopniowego pogarszania się ich stanu funkcjonalnego.

**Cel pracy:** Ocena jakości życia pacjentów ze stwardnieniem rozszianym oraz określenie zależności pomiędzy jakością życia a: postacią stwardnienia rozsianego, czasem trwania choroby oraz sprawnością funkcjonalną, a także porównanie kwestionariuszy do oceny jakości życia u chorych na stwardnienie rozsiane.

**Materiał i metody:** W badaniu wzięło udział 35 pacjentów z potwierdzoną diagnozą stwardnienia rozsianego. Jakość życia oceniana była za pomocą kwestionariusza SF-36 oraz MSIS-29. Oceniano także sprawność funkcjonalną pacjentów testem Timed Up&Go, na skali DeSouza oraz na 4-etapowej skali równowagi.

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The individual division on this paper was as follows: A – research work project; B – data collection; C – statistical analysis; D – data interpretation; E – manuscript compilation; F – publication search

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Wyniki: Średnie wyniki wszystkich podskal kwestionariusza SF-36 w badanej grupie osiągnęły wartości poniżej normy. Odnotowano silne dodatnie korelacje pomiędzy wynikami *Physical Functioning* (Aktywność fizyczna i jej ograniczenia spowodowane stanem zdrowia), *Role Physical* (Ograniczenia w pełnieniu ról społecznych z powodu problemów w funkcjonowaniu fizycznym) i *Physical Summary Component* (PSC), a rezultatami 4-etapowej skali równowagi oraz skali De Souza, a także silną ujemną korelację pomiędzy PF, RP PSC, a wynikami testu Timed Up&Go. Wraz z wydłużaniem się czasu trwania choroby znamienne obniżały się wyniki na podskalach PF oraz PSC.

Wnioski: 1. Dłuższy czas trwania choroby oraz gorsza sprawność funkcjonalna, wpływa na obniżenie poziomu jakości życia pacjentów ze stwardnieniem rozsianym. Należy spodziewać się, że ta grupa docelowa wymagała będzie szczególnego wsparcia ze strony formalnych i nieformalnych opiekunów oraz instytucji opieki zdrowotnej. 2. Silna korelacja pomiędzy wynikami uzyskanymi u chorych na stwardnienie rozsiane w kwestionariuszu SF-36 oraz MSIS-29, sugeruje, że stosowanie ich zamiennie do oceny niektórych obszarów jakości życia może być uzasadnione.

## INTRODUCTION

Sclerosis Multiplex (*SM*) is a chronic demyelinating disease of the central nervous system. On the basis of the estimates of the International Multiple Sclerosis Federation (IMSF) for the year 2008 it resulted that almost two million people worldwide suffer from MS. Almost a half of that number are inhabitants of: the USA (400000), Russia (250000) and Germany (122000)<sup>1</sup>. The greatest incidence of illness has been noted in Canada – 240 cases of MS for every 100000 inhabitants. While amongst the inhabitants of countries such as China, India or South Korea the incidence is minute and does not exceed 3.3 cases per 100000 inhabitants<sup>1</sup>. In Poland the number suffering from MS is estimated at around 50000, with which the number of female patients is double that of men<sup>1</sup>.

The aggregate of MS symptoms and their intensification is the decisive factor affecting the quality of patients' lives, therefore it is important to here mention what disturbances may occur during the course of the illness. The symptoms of the disease occur most often between the age of 20 and 40, however in recent years there is an evident rise in the number of cases of MS commencing at the age of ten or during puberty. The youngest patient described in the subject literature was only 2 years old, however the majority of children to be diagnosed are in their teens<sup>2</sup>. In Poland the average patient age at diagnosis is 33.6<sup>1</sup>.

As a result of the fact that the foci of demyelinations may occur in various parts of the nervous system, it is not possible to define a single classic view of the disease, for every patient develops a set of individualised symptoms. The most frequent symp-

tom are pyramidal paresis, most frequently of a para-, tri- or tetra-paresis nature. This quickly takes on a spastic character, with excessive deep reflexes and the presence of pathological symptoms<sup>3</sup>. Another frequent symptom are disturbances to coordination of a cerebellar ataxia character. These result from damage to the brain and/or connections of the brain with nuclei of the medulla oblongata. The most frequent pathologies connected with the presented damage include: dysmetria, adiadochokinesis, ataxic gait, intention tremor as well as scanned speech<sup>4</sup>. Disturbance to the sense of feeling in the course of MS appears in the form of numbness, paraesthesia, pain and a weakening of various localised feeling. There may also occur a sensation of being bound/restricted, awkwardness with hands, with correct muscle strength, Lhermitte's symptom as well as neuralgia of the trigeminal nerve<sup>5</sup>.

Another frequent symptom of MS is retrobulbar inflammations of the optic nerve. These manifest themselves through disturbances to vision, painful movements of the eye ball, distortion in the seeing of colours; this may partially result in a loss of sight in the eye in which the inflammation occurs. According to data from Oxford University, 50% of those suffering from MS more than likely will experience inflammation of the optic nerve during the course of their life. If it occurs still prior to the diagnosis of Multiple Sclerosis, while in the MRI image there are not seen demyelinating changes, then the risk of suffering from MS is less than 10%. However, in the case of the presence of typical changes in the MRI, the risk increases to about 80%<sup>6</sup>. Non-retention of urine is the next troublesome symptom of MS. Research conducted on a group of

120 patients with MS showed that disturbances in the functioning of the lower urinary tracts, which include non-retention of urine, urine retention as well as pollakiuria may be the first symptoms of MS. Intensification of these disturbances increase along with the disease's progression and after 10 years from diagnosis, 80% of patients admit to problems with their bladder. This has a marked influence on the quality of life as well as causing discomfort in social contacts<sup>7</sup>. A large group of MS symptoms are disturbances to the cognitive functions. These occur in 40-65% of patients<sup>8</sup>. Their intensification may depend on the degree of brain atrophy, the size of the area covered by demyelination as well as the number of changes in the non-damaged brain tissue. The chief manifestations of cognitive deficiencies are: disturbances in memory (chiefly operational and long-term) and attention span, abstract thought, performance functions as well as psychomotor sluggishness<sup>8</sup>. One of the symptoms that often appears in MS is fatigue syndrome. On average 50-60% of patients consider it to be the factor most damaging to their quality of life, making it difficult to take up or continue professional work as well as affecting an ability to function socially<sup>9</sup>. This is characterised by: apathy, a lack of energy, exhaustion, indifference and boredom. Fatigue syndrome differs across the course of MS from ordinary tiredness that is the result of intensive physical exertion. It may be defined as 'pathological exhaustion', having an impact on everyday activities. It is important, however, not to confuse fatigue syndrome with depression, in which tiredness may be one of the symptoms<sup>9</sup>. According to research around 50% of those suffe-

ring from SM experience depression during the course of their life<sup>10</sup>. This is one of the main factors influencing quality of life. This may result in a progression in cognitive disturbances, often weakening the relations a patient has with others, sometimes resulting in a failure to adhere to the regular prescribed medicine intake of drugs designed to modify the course of MS, and consequently a progression in the disease itself<sup>10</sup>.

### Quality of life in patients with Multiple Sclerosis

As a result of the long-term and progressive character of multiple sclerosis as well as the whole range of debilitating symptoms for a patient, those suffering from MS have a noticeably lowered quality of life (QoL) when compared to healthy individuals and even in relation to those suffering from other chronic illnesses like, for instance rheumatic joint inflammation<sup>11</sup>. Together with the duration of the disease and its progression the indicators of quality of life have a tendency to decrease<sup>12</sup>. The combination of progressiveness and the unpredictability of the disease create an unusually stressful picture, one strongly impacting on a lowering of QoL, not only in the patients themselves, but also amongst those close to them<sup>13</sup>. Interest in the subject of quality of life is connected inseparably with the increasingly penetrating analysis of the costs of medical care as well as the evaluation of the effectiveness and efficacy of the methods of treatment employed. The first piece of research into QoL in Multiple Sclerosis was published in 1992 roku<sup>11</sup>. From that moment onwards the number of works on the subject of the physical, emotional and social consequences of MS has grown rapidly<sup>14-16</sup>.

From amongst the universal questionnaires most often used in the evaluation of quality of life in MS patients one may mention *Medical Outcome Study 36-Item Short Form Health Survey (SF-36)*, *Life Satisfaction Questionnaire (LSQ)* as well as the *Quality of Well-Being Scale (QWBS)*<sup>17</sup>.

There also exist many specific instruments for measuring quality of life in MS. The most frequently used are: *Functional Assessment of Multiple*

*Sclerosis (FAMS)*, *Multiple Sclerosis Quality of Life Instrument (MSQoL-54)*, which came about through the addition of 18 questions characteristic for MS to the SF-36 questionnaire, *Multiple Sclerosis Functional Composite (MSFC)*, *Multiple Sclerosis Impact Scale (MSIS-29)*, *Multiple Sclerosis Quality of Life Inventory (MSQLI)* or *Health-Related Quality of Life Questionnaire for Multiple Sclerosis (HRQOL-MS)*<sup>18</sup>.

Those suffering from MS speak of a lower quality of life than the population as a whole, but they also obtain worse results on quality of life scales when measured against other chronic diseases such as rheumatic joint inflammation, illnesses of bowel inflammation or psychic illnesses<sup>11,19</sup>.

Several factors may influence this lowered level of life quality. Amongst these Benito-Leon et al.<sup>14</sup> have distinguished:

- troublesome symptoms of the disease,
- usually the young age at which the diagnosis is made,
- the unpredictable course of the disease, which affects the sense of control,
- the lack of any possibility for a complete cure,
- imperfection in existing methods of treatment, with side effects inclusive as well as the uneven access to the latest methods of treatment as a result of the costs involved.

A positive influence on the quality of life of SM patients is exerted by, among other things, the maintaining of independence in daily activities as equally in the taking of decisions, the sense of support from both family and friends as well as society together with medical personnel<sup>20</sup>. Amongst the factors that can aid in the im-

provement of QoL indicators in these patients is the undertaking of physical activity as well as, which is more important, self evaluation of the sense of one's own abilities<sup>21,22</sup>.

### AIM OF THE WORK

The aim of the present work was to evaluate the quality of life of patients with Multiple Sclerosis as well as defining the dependence between quality of life and such factors as: sex, disease duration, the form of MS as well as the physical functionality of the patient, and also to undertake a comparative look at quality of life questionnaires for patients with Multiple Sclerosis.

### MATERIALS

In the tests that were conducted from the 6<sup>th</sup> of November 2012 to the 12<sup>th</sup> of April 2013, participated 35 MS patients comprising 23 women and 12 men. These were patients of a Cracow clinic providing outpatient rehabilitation treatment for those suffering from Multiple Sclerosis. Prior to the commencement of tests each of the patients gave their oral consent to participate in the proceedings.

Qualified to the tests were patients: with diagnosed Multiple Sclerosis (one carried out by a neurologist); and in whom, for the duration of the research, there did not occur a new relapse of the disease requiring the application of steroid infusions.

The most numerous group in the sample tested were individuals who had diagnosed a primary-progressive MS (PPMS) (40%). Not noticeably fewer, for constituting 36% of those tested, were patients in whom there

Table 1

Description of the project sample	
Feature	n=35
Age ( $\bar{x} \pm OS$ )	45,9 $\pm$ 12,1
Men	12 (34,3%)
Women	23 (65,7%)
Disease duration length ( $\bar{x} \pm OS$ )	10,8 $\pm$ 9,3

n – number of testees, SD – Standard deviation

had been diagnosed a relapsing-remitting MS (RRMS). The frequency in the appearance of a secondary-progressive MS (SPMS) was 21%, while a progressive-relapsing MS (PRMS) 3%.

## METHODS

Quality of life was measured by means of the MSIS-29 questionnaire and the SF-36 questionnaire. The required licence to use the SF-36 questionnaire for research was obtained from Quality Metric Incorporation, which holds the copyright to the said. An official translation of the questionnaire into Polish was used in the research, this being obtained equally from Quality Metric Incorporation. Permission was also gained from the author of the MSIS-29 questionnaire to use the questionnaire for the duration of the research. Additionally before the tests were commenced the patients completed a personal questionnaire which contained, among others, questions on the subject of sex, education, professional status, the requirements for support from third parties, whether they were members of organisations grouping Multiple Sclerosis sufferers.

The **Multiple Sclerosis Impact Scale** (MSIS-29) questionnaire is a research instrument specific to Multiple Sclerosis, and published by Hobarta et al.<sup>18</sup> in 2001. It allows one to evaluate the influence of Multiple Sclerosis on the quality of life from the patient's perspective. MSIS-29 is composed of two parts – the first of these containing 20 questions concerns the effect of MS on the physical aspect of the patient's life, the second, composed of 9 questions, evaluates the influence of MS on the psychic state. The higher the result obtained in the test the worse the patient's quality of life<sup>23</sup>. The **Medical Outcome Study 36-Item Short Form Health Survey** (SF-36) is a universal instrument applied in the measurement of a subjective evaluation of the state of health. It tests two aspects of quality of life (the physical and the mental) by means of 36 questions grouped into 8 sub-scales: physical activeness and its limitation brought about by a state of health (*Physical Functioning*, PF), limitation in fulfilling social roles as a result of problems in physical functioning (*Physical Role Limitation*, RP), the experiencing

of pain (*Bodily Pain*, BP), general state of health (*General Health*, GH), the subjective evaluation of vigour and energy levels (*Vitality*, VT), social functioning (*Social Functioning*, SF), emotional functioning and its impact on social activity (*Role-Emotional*, RE) as well as psychic health (*Mental Health*, MH). The greater the number of points obtained the better the subjective quality of life<sup>24</sup>.

Functional fitness was evaluated by means of the following tests: the Timed Up&Go, a four-stage scale of balance and the De Souza Scale. The **Test Timed Up and Go** serves in testing balance as well as functional mobility, which impacts on the basic abilities to move about. This is a test used chiefly in the evaluating of the risk of falls in the elderly<sup>25</sup>, however its usefulness in the evaluation of falls in MS patients has also been proven. Those tested were required to: stand up from a chair, walk 3 metres, turn round, return and sit down in the chair<sup>26</sup>. The *Four-test balance scale* contains 4 static equivalent tasks of a rising level of difficulty, carried out without additional instrumental aids. The test should not involve a trial run, while each task is to be performed with footwear. The teste receives 0 points if they are not able to stand with their feet together for 10 seconds. The greatest number of points (4), are gained by a patient who can stand on one leg for 30 seconds<sup>2</sup>. The De Souza Scale serves in the evaluation of functional disability and mobility limitation in individuals with MS. It comprises 11 functions, which are ranked in order of those the earliest obtained in the course of man's motor development, to the most difficult motor tasks. The greatest number of points (11 pkt.) are obtained by a patient who is able to hold themselves in a one-legged position for 5 seconds on the lower limb under observation. The subsequent tasks with fewer points involve, among other activities, getting up from lying on one's back to standing without the support of the arms (9 pts), standing from a squatting position without the support of the arms (7 pts), walking a distance of 20 metres aided (5 pts), turning around from a position of lying on one's back in both directions (3 pts) or squatting without support

for 60 seconds, for which the patient is awarded 1 point<sup>28</sup>.

## Statistical analysis

The detailed results of the SF-36 questionnaire were calculated by means of the Health Outcomes Scoring Software 4.5 program. Further statistical analysis was conducted using Statistica 10. The descriptive statistics were used in the characterisation of the tested sample. The remaining analysis was conducted using *t*-Student tests for the independent groups while in the case of those not fulfilling its prerequisites a non-parametrical equivalent was used. All the results were analysed at the level of a statistical significance of  $p < 0.05$ .

## RESULTS

The results obtained in the MSIS-29 were converted in such a way so that the greater quantity of points obtained represented a higher quality of life, as was the case in the SF-36 questionnaire.

It was shown that the SF-36 and MSIS-29 questionnaires displayed a strong correlation between the matching areas of quality of life (at the level of  $r = 0.65$ ). As a result in further calculations the results obtained by means of SF-36 were used, which allowed one to evaluate more aspects of quality of life.

For the needs of analysing the SF-36 questionnaire the NBS (*Norm - Based Score*) results were taken into consideration. MS testees evaluated each of the tested aspects of quality of life detailed in the SF-36 questionnaire which were below the normative value.

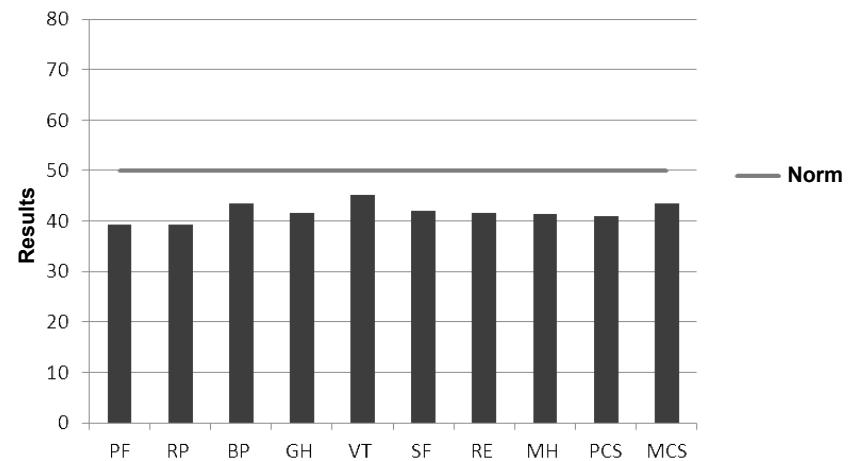
In the Timed Up&Go test the average result was 9.89 seconds ( $OS = 6.53$ ). On the De Souza Scale the greatest number of patients obtained a result of 11 points (3-11). The most frequently gained result on the 4-stage balance scale was 3 points (0-4).

In Table 2 are presented the average values obtained by the testees in the individual sub-scales of the SF-36 questionnaire in relation to: sex, disease duration, the type of MS as well as the results of functional fitness tests. No characteristic differences in the results obtained by women and

men on any of the sub-scales were found ( $p>0,05$ ). The patients who had been ill for a shorter time ( $\leq 10$  years) only obtained a statistically significantly better result than those who had been ill for over 10 years in the BP sub-scale ( $p=0,04$ ). In patients with a RRMS and a progressive type there was not noted any characteristic differences ( $p>0,05$ ). In the Timed Up&Go test patients who obtained a time of less than 10 seconds, obtained more points in each of the SF-36 sub-scales than those individuals who required more than 10 seconds to complete the test. Statistically significant were the differences PF, RP and PSC. Patients who obtained on the De Souza scale over 6 points also obtained better results in all the areas of the SF-36 questionnaire, when compared to those who gained 6 or fewer points. Statisti-

Figure 1

The Comparison of the medial results in the sub scales of the SF 36 questionnaire within the sample



PF - Physical Functioning, RP - Role Physical, BP - Bodily Pain, GH - General Health, VT - Vitality, SF - Social Functioning, RE - Role Emotional, MH - Mental Health, PCS - Physical Component Summary, MCS - Mental Component Summary

Table 2

Medial results in the subscales of the SF 36 questionnaire										
	PF	RP	BP	GH	VT	SF	RE	MH	PSC	MSC
<b>Sex</b>										
Women	39,0	38,5	42,2	43,6	48,6	41,2	40,9	43,9	40,3	45,2
Men	43,3	39,8	47,9	40,8	46,9	40,2	42,0	41,7	44,0	42,3
<i>p</i>	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
<b>Duration of SM</b>										
$\leq 10$ years	42,2	39,9	<b>46,6</b>	42,5	48,1	39,9	43,2	44,1	<b>42,8</b>	44,5
$> 10$ years	37,9	37,4	<b>40,5</b>	43,0	47,9	42,3	38,3	41,7	<b>39,7</b>	43,7
<i>p</i>	NI	NI	<b><math>p=0,04</math></b>	NI	NI	NI	NI	NI	<b><math>p=0,04</math></b>	NI
<b>Type of SM</b>										
RR	38,7	38,4	41,0	40,7	44,9	37,7	37,9	40,2	40,4	40,5
PP+WP	40,1	37,7	45,2	42,5	48,8	41,6	41,9	44,1	41,0	45,5
<i>p</i>	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
<b>Timed Up&amp;Go</b>										
$\leq 10$ seconds	<b>43,6</b>	<b>41,1</b>	44,5	43,2	49,0	41,7	43,1	44,0	<b>43,4</b>	44,9
$> 10$ seconds	<b>32,3</b>	<b>32,8</b>	43,0	40,5	42,7	38,1	34,7	36,9	<b>37,6</b>	39,1
<i>p</i>	<b><math>p=0,005</math></b>	<b><math>p=0,01</math></b>	NI	NI	NI	NI	NI	NI	<b><math>p=0,03</math></b>	NI
<b>De Souza Scale</b>										
$\leq 6$ pts	<b>27,4</b>	<b>29,1</b>	40,4	38,2	45,9	36,0	<b>30,1</b>	39,1	<b>33,3</b>	40,2
$> 6$ pts	<b>42,2</b>	<b>40,2</b>	44,6	43,2	48,3	41,5	<b>42,7</b>	43,7	<b>42,7</b>	44,7
<i>p</i>	<b><math>p=0,005</math></b>	<b><math>p=0,01</math></b>	NI	NI	NI	NI	<b><math>p=0,047</math></b>	NI	<b><math>p=0,01</math></b>	NI
<b>4-stage balance scale</b>										
$\leq 2$ pts	<b>31,4</b>	<b>32,0</b>	42,8	42,9	46,7	38,4	36,4	42,7	<b>35,9</b>	44,0
$> 2$ pts	<b>43,6</b>	<b>41,4</b>	44,6	42,6	48,5	41,7	42,9	43,3	<b>43,6</b>	44,3
<i>p</i>	<b><math>p=0,001</math></b>	<b><math>p=0,002</math></b>	NI	NI	NI	NI	NI	NI	<b><math>p=0,003</math></b>	NI

\* higher results means a better quality of life

PP - Primary-Progressive MS, RR - Relapsing-Remitting MS, SP - Secondary-Progressive MS, MS - Multiple Sclerosis, PF - Physical Functioning, RP - Role Physical, BP - Bodily Pain, GH - General Health, VT - Vitality, SF - Social Functioning, RE - Role Emotional, MH - Mental Health, PCS - Physical Component Summary, MCS - Mental Component Summary  
 NS - non significance

cally significant were the differences in the sub-scales PF, RP, RE and PSC ( $p < 0.05$ ). Those who obtained over 2 points on the 4-stage balance scale gained significantly better results in the sub-scales of PF, RP and PCS, than did patients who on the 4-stage balance scale gained 2 or fewer points ( $p < 0.05$ ).

The correlation between each of the sub-scales in the SF-36 questionnaire, the duration of the disease, and the results of the tests into functional fitness were evaluated by means of the Spearman coefficient correlation  $\rho$  (Table 3). The results obtained on the De Souza Scale correlate favourably with the PF, RP, RE and PSC sub-scales. High indicators of correlation were obtained for PF ( $r = 0.54$ ), RP ( $r = 0.603$ ) and PSC ( $r = 0.502$ ). A positive coefficient of correlation appeared equally amongst the results of the 4-stage balance scale and the sub-scales of PF ( $r = 0.557$ ), RP ( $r = 0.565$ ) and PSC ( $r = 0.616$ ). Additionally the results of the Timed Up&Go test negatively correlate with the results of the sub-scales PF, RP, RE and PSC. High indicators of correlation were obtained for PF ( $r = -0.603$ ), RP ( $r = -0.466$ ) and PSC ( $r = -0.570$ ). In addition, there was noted a significant correlation between a longer duration of SM and poorer PF ( $r = -0.358$ ) and PSC ( $r = -0.351$ ) results.

**DISCUSSION**

The results of our research reiterate the tendency observed earlier whereby patients with MS in their evaluation of aspects of quality of life as detailed in the SF-36 rate themselves lower than the accepted norm. More than likely this results from the specifics of the disease and its negative

impact on daily life. Similar results have been obtained in, among other places, Australia and Italy<sup>12,29</sup>.

The results of the research of Drulovic et al.<sup>30</sup>, conducted on 156 patients who evaluated their quality of life by means of the SF-36 questionnaire, did not show any significant differences between the results obtained in the male and female groups. Similar results were also obtained by Polish researchers, who by means of the SF-36 questionnaire among other things, tested 64 individuals with diagnosed Multiple Sclerosis<sup>31</sup>. They evaluated the impact of socio-demographic factors on patient quality of life. The results obtained as a result of these considerations pointed to the absence of a significant influence on the part of the gender of those tested as well as their place of abode on the subjective evaluation of quality of life. High economic (financial) status was conducive to a higher evaluation of quality of life in the PF (*Physical Functioning*) and GH (*General Health*) sub-scales<sup>31</sup>. The results of our own tests also did not indicate differences in the evaluation of quality of life amongst women and men suffering from MS.

In relating to the specifics of illness and the varieties of its course it is worth considering the differences in the quality of patient life with the various forms of Multiple Sclerosis. In the research available there is no absence of tests which show the existence of characteristic differences between groups differentiated by the type of the disease. In the research by Drulovic et al.<sup>30</sup>, mentioned earlier, the average results of each of the sub-scales in the SF-36 questionnaire, obtained by patients with a progressive type of the disease, were lower than

for individuals with a RRSM. For the sub-scales PF (*Physical Functioning*), RP (*Role Physical*), SF (*Social Functioning*) and RE (*Role Emotional*) these differences were statistically significant<sup>30</sup>. Our own research did not confirm these notions, although this could possibly be connected with the small number of patients who were differentiated by particular forms of SM.

In our research the better fitness test results correlate with the above results obtained in the sub-scales PF and RP of the SF-36 questionnaire. This means that together with an improvement in the functional fitness state of patients there increases their subjective evaluation of physical fitness and decreases the sense of limitations brought about by their state of health (PF), as well as them more favourably perceiving the impact of their state of health on eventual limitations in fulfilling social roles (RP). Helpful in explaining this phenomenon appears to be the scientific report of Molt et al.<sup>21</sup>, who tested the dependence between changes in the level of physical activity, patient's own evaluation of physical fitness and ability and the quality of life of patients with a RRMS. They showed that it follows to consider physical activity and, something which appears to be more important, the subjective level of evaluation of one's own abilities amongst the factors that can improve the indicators of QoL<sup>21,22</sup>.

The results of the research confirm a significant favourable dependence between the time that has elapsed from the diagnosis of MS and a deterioration in patient quality of life<sup>32</sup>. In our research the length of disease duration only negatively correlates with the results of the PF sub-scale (phy-

**Table 3**

<b>The correlation between the results of the SF 36 questionnaire's sub scales, disease duration and the results of the functional tests measurements</b>										
	<b>PF</b>	<b>RP</b>	<b>BP</b>	<b>GH</b>	<b>VT</b>	<b>SF</b>	<b>RE</b>	<b>MH</b>	<b>PSC</b>	<b>MSC</b>
MS duration	<b>-0,358</b>	-0,286	-0,318	-0,104	-0,098	0,024	-0,294	-0,078	<b>-0,351</b>	-0,028
De Souza scale	<b>0,540</b>	<b>0,603</b>	0,098	0,127	0,277	0,257	<b>0,340</b>	0,169	<b>0,502</b>	0,180
Balance scale	<b>0,557</b>	<b>0,565</b>	0,192	0,176	0,168	0,232	0,259	-0,011	<b>0,616</b>	0,011
Timed Up&Go	<b>-0,603</b>	<b>-0,466</b>	<b>-0,353</b>	-0,172	-0,292	-0,262	<b>-0,376</b>	-0,216	<b>-0,570</b>	-0,196

PF - Physical Functioning, RP - Role Physical, BP - Bodily Pain, GH - General Health, VT - Vitality, SF - Social Functioning, RE - Role Emotional, MH - Mental Health, PCS - Physical Component Summary, MCS - Mental Component Summary, MS - Multiple Sclerosis, Timed Up&Go

sical activity and its limitation resulting from the state of health), and also with the part of the questionnaire on physical fitness as a whole (PSC). This might be the result of the fact that the functional state of the patients constantly deteriorated with the passing of time, affecting the physical aspect of QoL. However, a chronic disease allows for a gradual development in strategies of coping with the impact of the disease on the psychological aspects of quality of life<sup>33</sup>.

Despite certain limitations in the research we conducted, one may conclude from following the subject literature that the quality of life of patients with Multiple Sclerosis is placed at a lower level than the normative values for the general population and that this depends on the degree of the physical functionability of the patients themselves.

## CONCLUSIONS

1. Patients with Multiple Sclerosis display a lowered level of quality of life. The results of the SF-36 questionnaire correlate well with the measured level of functional fitness and the length of the disease's duration. This means that longer disease duration and worse functional fitness influence the lowered level of quality of life for Multiple Sclerosis patients. It follows to expect that this group will require special support on the part of formal and informal carers as well as from health service institutions.
2. The significant correlation between the results obtained for patients with SM in the SF-36 questionnaire as well as in the MSIS-29, suggest that accordingly their interchangeability in the evaluating of certain areas of quality of life may be justified. The MSIS-29 questionnaire, which is shorter as well as according to researchers contains less ambiguous questions, appears to be the better choice.

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