

Aspects Quality of Life of Seniors with Total Hip Replacement

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ABSTRACT

Background: The work deals with the aspects quality of life of seniors with total hip replacement due to arthritis. The work is mainly based on theoretical knowledge of the issues and implement our own research. The information were searched mainly in Pubmed and Cinahl between October 2015 and March 2016. Our data was compared with two works. Foreign long-term study evaluating the quality of life of ten years from the operation of total hip replacement and the Czech study evaluating the quality of life one year after surgery using a minimally invasive surgical approach. One of the most common diseases with which we can meet before retiring, then almost always in the elderly, is a degenerative disease of one or both hip joints. It is diagnosed by a simple majority of persons over 65 years for people over 75 years is a noticeable increase up to 80%.

Objective: The main objective was to determine the quality of life of elderly people with total endoprosthesis (TEP) and compare the results with the elderly with osteoarthritis of the hip joint without surgical solutions.

Methods: Data was collected by means of a standardized questionnaire SF-36. Analysis of the collected data was conducted and a simple comparison of responses. The level of quality of life was assessed using indices of quality of life and set hypotheses.

Results: The quality of life index showed that the quality of life of elderly people with TEP is higher in all the areas – physical health, physical health limitation, pain, vitality, general health perceptions and the mental area. All the results of our research group speak in favor of seniors with TEP. On the basis of the hypotheses it was found that seniors with TEP, compared to seniors with arthritis, indicate lower intensity of pain, are not so limited in physical activity and performing work, much more optimistically assess their health status and do not expect so often that their health will deteriorate. One hypothesis confirmed that the TEP seniors in our group are happier compared to seniors with arthritis.

Conclusion: Due to the high number of performed arthroplasty of the hip joints and the increasing number of reoperations in old age, the results that have been attained in our group are very encouraging because endoprosthesis reduces pain and in turn, increases flexibility and helps to improve the quality of life of seniors, compared to a group of seniors who have not undergone the operation. The research went the following key findings: seniors with total hip arthroplasty frequently rated their health today than a year ago, about the same as a year ago. Seniors with osteoarthritis of the most voted option also about the same as a year ago. For seniors with total hip arthroplasty is the most restrictive walk up several flights of stairs and then walk a distance of 1 kilometer. Seniors with TEP most frequently reported restrictions on the type of work or activity. The resulting indexes indicate to us that seniors with TEP are less limited by pain and their quality of life in all the areas higher than seniors with arthritis. Seniors with TEP achieving higher values in all the areas.

KEY WORDS

quality of life, seniors, endoprosthesis, arthrosis, arthroplasty, SF-36 questionnaire, health, daily activities, pain, emotional states

INTRODUCTION

Increased life expectancy and aging of population results in the fact that is no longer exception that seniors continue to live up to 20 years after retirement. A degenerative disease of one or both hip joints is one

of the most common diseases, which we can meet already before retirement, and almost always at senior age. This is diagnosed in a simple majority of over 65s, increase up to 80% is noticeable in persons over 75 years (1). In this disease, the pain and associated

limitation of movements, which impede working or sporting activities are the biggest problems. However, it might limit also performance of routine daily activities over time, which may very negatively affect the quality of life. The continuing pain is usually the reason for the replacement of damaged joint with a new one, so called total endoprosthesis (TEP). The main goal of this procedure is to reduce joint pain, increase range of motion and enhance the quality of life for clients. (2). Replacing own hip joint for endoprosthesis (TEP) is a surgical procedure, also called arthroplasty. Arthroplasty is technically, biologically and financially most demanding, but, from a long-term point of view, the most successful solution of damaged bearing joints, unresponsive to conservative treatment (3). Like every surgery, arthroplasty also means many subsequent restrictions, in particular of mobility, and the clients have to observe certain principles. There are several so called „restricted movements“, which can cause dislocation of the endoprosthesis, such as external rotation and adduction of the hip joint, if the two movements are performed at the same time. Furthermore, we can mention the hip flexion over 90° (4) or common adverse movements like crossing the legs, straight bending forward, rapid rotation of the hull, lying on the operated side, carrying of heavy loads or doing squats (5). Like every surgery, also arthroplasty can cause potential complications. Among the late complications we can include aseptic loosening of the prosthesis, dislocation of the endoprosthesis or periprosthetic fracture (5). There is a number of factors influencing whether the patient will receive a new hip joint, such as parameters of the operation (surgical technique, type of implant, soft tissue damage) and general condition of the patient, including his motivation and cognitive and motor skills (2).

Aging is unrepeatable biological process, which brings many changes not only in terms of physical condition, but also gradual loss of mental functions, caused by physical changes in the central nervous system, sensory perception, ability to move, hormonal control, and more (6, 7). The quality of life of seniors is affected by many factors, including in particular state of health and health care, lifestyle, social environment, material situation, activity and autonomy (8). Physical self-sufficiency, due to which the seniors attribute great importance to health, is the basis of the autonomy of seniors. A senior feels self-sufficient when he does not need to bother and burden his relatives with his own demands (9). If there is a subjective deterioration in the health of the senior, there is also a reduction in self-sufficiency and a weakening of feeling of being autonomous. Seniors often evaluate their health con-

dition by rating their ability to walk. To be able to walk and have healthy lower limbs is a priority for them. Limited possibility of movement, inability to sustain standing for longer time and thereby often associated falls are then evaluated very poorly. Physical self-sufficiency represented right by mobility is one of the priority needs for seniors (10). Mobility is important to connect the individual with the social environment and it allows fulfilling basic needs, from shopping to maintaining social relationships. Seniors find very troubling, if they are not mobile at least within their own home. A number of studies indicate that mobility and ability to get out of the house are essential elements for the quality of life of seniors. All needs are therefore more easily satisfied if one is mobile and active. For the elderly, it is important to maintain activity at such level, so that it maintains a practical self-sufficiency (11).

The hip joint replacement is performed in 10,000 patients in the Czech Republic each year and this number is growing constantly. Just for comparison, up to 1,860,000 TEP might be performed in the US each year in 2050 according to calculations. It is then possible to use the population model for 2020 and further to assess the aging of population, when the baby boomers born in the late '60s and '70s in the Czech Republic will reach the age of 50–60 years (1, 2). Population aging increases the incidence of reoperations joint, thus its re-replacement. The durability of artificial joint is estimated for 10 years (in the Czech Republic for up to 12 years). The durability means the period from the surgery to the occurrence of the first problems (2). Precisely those data are tracked in the National Register of joint replacements, in which physicians have an obligation to contribute since January 1, 2015 (2).

OBJECTIVES

The aim of the study was to determine the level of quality of life of seniors who have undergone total hip arthroplasty due to arthrosis, and to compare the data obtained with the elderly with osteoarthritis in one or both hip joints and who had not received surgery yet.

Partial objectives of the work

1. To find out how people with exchanged hip joint assess their health compared with those with osteoarthritis with no surgical solution.
2. Determine the extent to which are the people with joint endoprosthesis limited in performing normal daily activities.
3. Determine the intensity of pain in patients with joint prosthesis compared to persons with osteoarthritis of the hip joint with no surgical solution.

4. To assess the prevalence of feelings of sadness, happiness and well-being of people with joint endoprosthesis compared to persons with osteoarthritis of the hip joint with no surgical solution.

METHODOLOGY

We used a questionnaire SF-36 (36 item Short Form Health Survey) for data collection, which can be used in clinical practice and research and is thus one of the most commonly used questionnaires, also because its original version has been validated and standardized in more than 15 countries. Questionnaire in its 36 questions assesses eight dimensions of physical activity, limitations of physical activity, pain, general evaluation of health, vitality, social activity, limitations due to emotional problems, and mental area. The questionnaire contains one more question that does not fit into any dimension. This question determines perception of the current health compared to situation one year ago (12, 13). The advantage of the questionnaire is a possibility of comparison with other groups. For our purposes, the questionnaire was shortened by issues relating to the strenuous sport or heavy physical activity due to senior age. Despite this reduction of questions, the questionnaire has been chosen, right for the possibility of calculating the indices of quality of life and a comparison with other works operating over this questionnaire.

Data were collected at selected health and social establishments in Moravskoslezský Region. The research group includes seniors hospitalized at internal and orthopaedic departments, clients of Darkov spa, clients of orthopaedic clinics and seniors using home care services and homes for the elderly in the district of Karviná. The actual data collection was conducted from October 2015 to January 2016. Questionnaires were filled with seniors with the assistance of the author, or in cooperation with other workers of the facilities.

Ethical aspects: We obtained a written consent with the investigation and data acquisition in every healthcare and social facility and a verbal consent of each addressed respondent.

The survey included 100 respondents with a prosthesis in one or both hip joints and 100 people with osteoarthritis of the hip joint. In total, the surveyed sample included 200 respondents. The respondents were selected for the research using a deliberate selection based on the fulfilment of criteria. The criteria for inclusion were: age of respondents over 60 years, mobility, orientation in all directions and consent to the

questionnaires. In seniors with total hip replacement (hereinafter, TEP), there was also a criterion of period from performing the surgery, which could not be less than 6 months. The criteria for inclusion in the group of seniors with arthritis included also the stage of osteoarthritis, as seniors with arthritis II. to IV. grade were selected for the research. Seniors with ongoing acute or chronic severe disease, which could negatively affect their quality of life, were excluded.

The survey was conducted using a quantitative method. The respondents' answers to each question were compared between the two groups of seniors. We used the Pearson's chi-squared test for testing the hypotheses and we created a Pivot Table. Determined significance level of alpha testing hypotheses = 0.05 (5%). On admission of the null hypothesis the results may be explained by the effect of coincidence and there may not exist a connection between the studied phenomena. For statistically significant results, this means that they cannot be explained by the effect of coincidence (4).

The standardized questionnaire also enabled index calculation of quality of life in particular areas. We thus calculated indices of quality of life using the arithmetic mean that enabled comparison with other works. All calculations and tables were created in Microsoft Office Excel 2013.

There 36 were men and 64 women among the 100 respondents who underwent total hip arthroplasty, and 39 men and 61 women in seniors with arthritis. Most respondents were in the age group 60–74 years, namely 70% of respondents in seniors with TEP and 59% in seniors with arthritis. 73% of respondents were operated on one hip joint, double-sided TEP was in 27% of respondents. 22% of seniors had TEP less than 1 year, 47 % of seniors had it already for 1–5 years, 19% of seniors had TEP for 6–10 years and 12% of seniors had TEP more than 10 years, a period equivalent to durability of the total joint replacement. The standard deviation was not calculated.

RESULTS

The first partial objective of our research was to determine, how people with exchanged hip joint assess their health compared with those with osteoarthritis with no surgical solution.

Questions, which subjectively evaluated the level of overall health condition and health standards today in respect of a year ago (Graph 1) summarize the different dimensions compared in the two groups of seniors.

Seniors with total hip arthroplasty most often rated their health today as almost the same as a year ago (33 %). The second most frequent response was a bit better than a year ago (27%). 17% of seniors with

TEP elected the option much better than a year ago. Seniors with osteoarthritis also mostly voted the option almost the same as a year ago (43%). The second most frequent response was a bit worse than a year ago (32%). Seniors with TEP least often selected the option much worse than a year ago (3%) and conversely seniors with osteoarthritis least often selected the option much better than a year ago.

During the evaluation of the overall health condition, the seniors with TEP of the hip joint mostly perceived their health as good (41%), the second most common response was very good (27%). Seniors with osteoarthritis mostly reported equally the options good and quite good (both 37%), followed by the option very good (14%). The least often selected option by both groups was excellent 1% in seniors with TEP

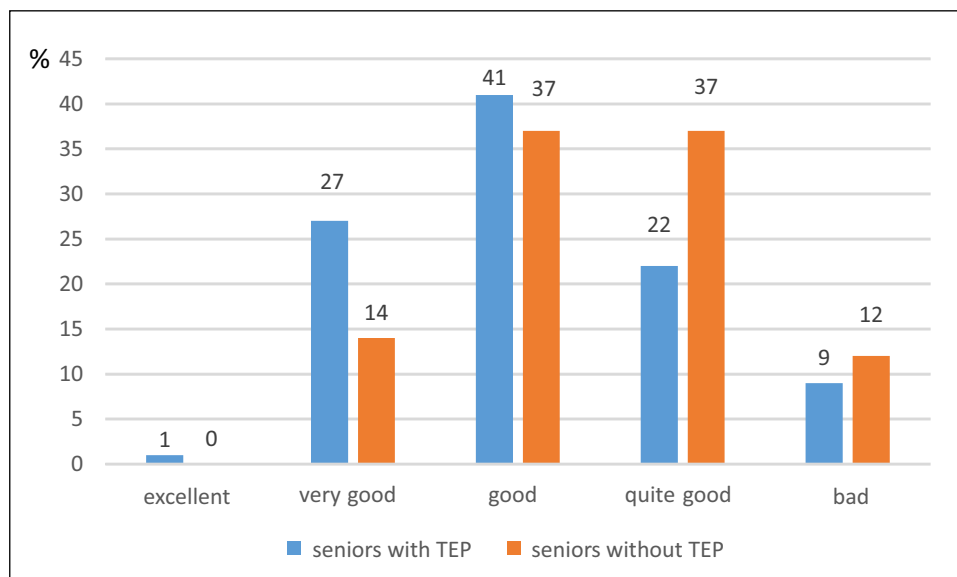
and 0% in seniors with osteoarthritis of the hip joint. 9% of seniors with TEP and 12 % of seniors with osteoarthritis selected the option bad (Graph 2).

The resulting p-value (0.0000460) is less than 0.05, the calculation thus implies that there is a statistically significant difference in the assessment of own health (today, in comparison to a year ago) among seniors with TEP and seniors with osteoarthritis of the hip joint. The seniors with osteoarthritis of the hip joint perceive their health much better compared to seniors with osteoarthritis of the hip joint.

The second objective was to determine the extent to which are the people with joint endoprosthesis limited in performing normal daily activities. The seniors with TEP find walking up several flights of stairs most limiting (32%), followed by walking a distance of 1 km (26%).

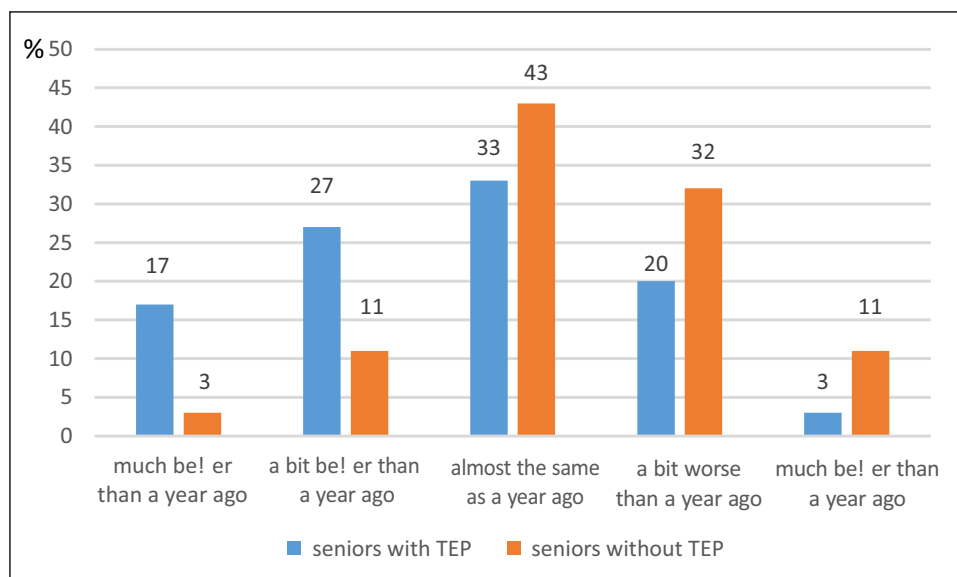
Graph 1

Evaluation of health today compared to the situation a year ago in TEP seniors and seniors with osteoarthritis of the hip joint



Graph 2

Evaluation of the overall health condition in seniors with TEP and seniors with osteoarthritis of the hip joint



The resulting p-value (0.0000480) is less than 0.05. Statistical calculation confirmed our assumption that there is a statistically significant dependence between the time elapsed since the surgery and limitations at walking 1 km in seniors with hip TEP. Difficulties in walking for 1 kilometre grow with increasing duration from surgery. Walking down the street several tens of meters (77%) and walking for 100 meters (67%) were reported as not limiting activities. Seniors with hip TEP most frequently reported limitations on the type of work or activity (69%). On the contrary, most of them also reported that substantial time for the work did not shorten (62%). Seniors with hip TEP chose mostly the option of a bit in case of question about limitations in normal social life with family, friends, neighbours or the wider community in the last four weeks (30%). In second place, they answered not at all (25%), while the option very much was chosen the less frequently (6%).

The third sub-task of our work was to determine the intensity of pain in patients with joint prosthesis compared to persons with osteoarthritis of the hip joint with no surgical solution. Seniors with hip TEP most frequently rated the intensity of their pain in the past 4 weeks as very moderate (25%) and medium (23%), whereupon they opted to severe pain least often (5%). Seniors with osteoarthritis most frequently rated their pain as moderate (38%). Certain differences in results were managed in no pain in seniors with TEP (12%) and seniors with osteoarthritis (2%).

The resulting p-value (0.0021617) is less than 0.05. The calculation thus implies that there is a statistically significant difference between the intensity of pain in seniors with hip TEP and seniors with osteoarthritis of hip joint.

Seniors with hip TEP report less pain compared to seniors with osteoarthritis. The result can be also proven by the calculation of Indexes of quality of life in dimension Pain (Table 1), in seniors with hip TEP and seniors with osteoarthritis of hip joint and subsequent comparison, where the seniors with TEP reached higher values.

Table 1 Indexes of quality of life in different dimensions

Dimensions	Seniors with hipTEP	Seniors with osteoarthritis
Physical activity	64.830	56.055
Limitation of physical activity	46.019	38.250
Pain	55.950	45.975
General evaluation of health	51.360	45.050
Vitality	52.330	43.600
Mental area	71.520	71.960

Legend: TEP – total endoprosthesis

The last, fourth aim of this work was to assess the prevalence of feelings of sadness, happiness and well-being of people with joint endoprosthesis compared to persons with osteoarthritis of the hip joint with no surgical solution. The most frequent answer of seniors with TEP about the feelings of zest for life was sometimes (31%), the least often replies were always and never (both 2%). The most frequent response about the feeling of nervousness was never (33%), followed by rarely (29%), the least often reply was always (3%). The most frequent answer about feelings of depression was never (65%) the least often replies were always and mostly (both 0%). The most frequent answer about feelings of peace and tranquillity was mostly (30%). The most frequent response about feeling of fullness of energy was sometimes (29%). Pessimism and sadness was the mostly evaluated with the option never (34%), while always was chosen least often (1%). The most frequent answer about feelings of exhaustion was sometimes (37%), the least often reply was always (1%). Feelings of happiness were most frequently evaluated with mostly (42%), the least often reply was never (3%).

The most frequent answer of seniors with osteoarthritis about the feelings of zest for life was sometimes (33%), the least often replies were always and never (both 6%). The most frequent response about the feeling of nervousness was never (47%), followed by rarely (26%), the least often reply was always (0%). The most frequent answer about feelings of depression was never (67%), the least often reply was always (0%). The most frequent answer about feelings of peace and tranquillity was mostly (30%). The most frequent response about feeling of fullness of energy was rarely (33%). Pessimism and sadness was the mostly evaluated with the option rarely (36%), while always was chosen least often (0%). The most frequent answer about feelings of exhaustion was mostly (33%), the least often reply was never (3%). Feelings of happiness were most frequently evaluated with mostly (42%), the least often reply was never (0%).

The resulting p-value (0.0197662) is less than 0.05. The calculation thus implies that there is a statistically significant difference in indicating the feeling of happiness in seniors with hip TEP and seniors with arthritis of the hip joints. Seniors with the hip TEP feel happier more often compared to seniors with osteoarthritis.

For the life quality assessment, we calculated indices of quality of life using the arithmetic mean in the following dimensions: Physical activity, Limitation of physical activity, Pain, Vitality, General evaluation of health and Mental area (Table 1). It's a fact that the higher the resulting value in the given dimension, the higher the level of quality of life.

Comparison in the context of our groups of seniors showed that the values were almost identical only in Mental area, where seniors with arthritis achieved insignificantly higher values (71.96 compared to 71.52 in seniors with TEP). The area of mental health is also an area where the seniors achieved maximum results. Our groups reached the highest differences between the values in Pain, where the index of quality of life of seniors with TEP reached 55.95 points in comparison to 45.97 points in seniors with arthritis. The resulting indexes indicate us that seniors with TEP are less limited by pain and their quality of life is better than in seniors with arthritis in all the areas. Seniors with THR achieved higher values in all monitored areas, and thus higher quality of life compared to seniors with arthritis.

DISCUSSION

Our results were compared to those of persons one year after surgery using miniinvasive technique (9) and with the results of long term studies involving seniors aged 65–74, who underwent hip joint replacement between 1985–1996 (8). The results of comparison are shown in Table 2. Unfortunately, we did not manage to find further similar studies to compare data.

The results showed that seniors with TEP in our research reach lower values in all areas. The biggest differences between our group of seniors and seniors with TEP 1 year after surgery (9) was in Limitation of physical activity, where the difference was 21.77 points (our results indicate 46,019 points versus 67.79 points in the dissertation). In comparison with our group of seniors with arthritis, the difference was even 29.54 points. Difference in Pain, when compared with the TEP group of seniors in our group, was 20.28 points (55.95 points versus 76.23 points in the dissertation by Musil). Comparing the results of Musil and se-

niors with arthritis, where the difference was 30.25 points, brought the highest differences. The difference in results may be mainly due to a different age of the respondents, when our group consisted of only seniors over the age of 60 years, and also the length of period from the surgery, as the research sample in the dissertation contains only respondents 1 year after surgery. For this reason, our results were compared with foreign long-term research (8), which includes respondents who underwent surgery between the years 1985–1996. We selected a group of seniors in the age range 65–74 for comparison. Compared to the results of this research, both groups of our respondents achieve better results and thus also a higher quality of life. The only area in which Mariconda reached higher result was Limitation of physical activity, where Mariconda reached 50.0 points compared to 49,019 points for our seniors with TEP. However, such comparison cannot be considered valid, because our respondents did not fill in the entire questionnaire for reasons, which we state within the limitations.

An important result is that both groups, namely seniors with TEP and seniors with osteoarthritis, reached a relatively high results in mental health, which may indicate an optimistic understanding of the situation even in situation of chronic disease and condition after surgery, as well as sufficient saturation of psychological needs in older age. From the results, we can also conclude that the quality of life improves due to the replacement of arthritic joint for an endoprosthesis.

LIMITS

The work was limited mainly by time, as there were only 4 months for the selection of respondents and completing the questionnaires, which corresponds to the size of the investigated group. Furthermore, we were limited by the length of the questionnaire from which some questions were removed, because they

Table 2 Comparison of the results with other works

Dimensions	Seniors with hip TEP	Seniors with osteoarthritis	Musil, Filip (2011) – (people 1 year after operating TEP)	Mariconda et al. (2011)
Physical activity	64.830	56.055	72.500	44.100
Limitation of physical activity	46.019	38.250	67.790	50.000
Pain	55.950	45.975	76.230	48.500
General evaluation of health	51.360	45.050	57.310	41.200
Vitality	52.330	43.600	64.150	49.100
Mental area	71.520	71.960	77.220	54.500

Legend: TEP – total endoprosthesis

were not suitable for seniors (especially questions about sports or heavy physical activity). Although it is possible to accept that the results might have been distorted due to the removal of the aforementioned items of the questionnaire, with respect to the fact that there are also seniors active in sports. The questionnaire was also reduced due to the time requirements, since completing the questionnaire mostly lasted 15 minutes, often with the assistance of another person. Finding of only two studies that could be used in discussion, was another prominent limitation of the work.

CONCLUSION

The main objective of this work was to investigate some aspects of quality of life of seniors with hip TEP in comparison with the quality of life of seniors with osteoarthritis of the hip joint. Calculating the index of quality of life in Physical activity, Limitation of physical activity, Pain, Vitality, General evaluation of health and Mental area it was found that seniors with TEP achieve better results and therefore better quality of life compared to seniors with osteoarthritis. The highest values were achieved in Mental area, with just a slight difference in results of the two groups of seniors. Both groups achieved the lowest values in the area Limitation of physical activity, where seniors with osteoarthritis felt worse than seniors with TEP.

The research derives following findings:

- Seniors with total hip arthroplasty most often rated their health today as almost the same as a year ago. Seniors with osteoarthritis also mostly voted the option almost the same as a year ago
- Seniors with hip TEP find walking up several flights of stairs the most limiting, followed by walking for 1 kilometre.
- Difficulties in walking for 1 kilometre grow with increasing duration from surgery.
- Seniors with hip TEP most frequently reported limitations on the type of work or activity
- Seniors with hip TEP chose mostly the option of a bit in case of question about limitations in normal social life with family, friends, neighbours or the wider community in the last four weeks.
- Seniors with hip TEP most frequently rated the intensity of their pain in the past 4 weeks as very moderate. Seniors with osteoarthritis most frequently rated their pain as moderate.
- The most frequent answer of seniors with TEP about the feelings of zest for life was sometimes, the most frequent response about the feeling of nervousness

was never, the most frequent answer about feelings of depression was never, the most frequent answer about feelings of peace and tranquillity was mostly, the most frequent response about feeling of fullness of energy was sometimes and the most frequent answer about feelings of exhaustion was sometimes. Feelings of happiness were most frequently evaluated with mostly.

- The most frequent answer of seniors with osteoarthritis about the feelings of zest for life was sometimes, the most frequent response about the feeling of nervousness was never. The most frequent answer about feelings of depression was never, the most frequent answer about feelings of peace and tranquillity was mostly, the most frequent response about feeling of fullness of energy was rarely (33%). Pessimism and sadness was the mostly evaluated with the option rarely and the most frequent answer about feelings of exhaustion was mostly. Feelings of happiness were most frequently evaluated with mostly.
- The resulting indexes indicate that seniors with TEP are less limited by pain and their quality of life is better in all the areas than in seniors with arthritis. Seniors with TEP achieved higher values in all monitored areas (Physical activity, Limitation of physical activity, Pain, Vitality, General evaluation of health and Mental area), and therefore a higher quality of life compared to seniors with arthritis.

The total hip replacement with an endoprosthesis is currently a standard procedure, undergone by more and more people of not only senior age. As life expectancy continuously increases, more seniors experience arthritis of weight-bearing joints that causes pain and limitation in movement, thus worsening the quality of life. The arthroplasty represents a solution to this situations as well as other ones (fractures, joint inflammation). Availability of this intervention, aging population and decreasing age, in which the operations are performed, will cause an increasing number of seniors with endoprosthesis as well as the frequency of reoperations, when seniors will undergo repeated replacement of already damaged endoprosthesis. Due to the large numbers of seniors with TEP, the results that relate to our respondents are very optimistic, because it was shown that the invasive surgery relieves pain, increases range of motion and mobility of seniors and thereby improves their quality of life.

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