ORIGINAL ARTICLE

ACTA Vol. 12, No. 2, 2014, 143-154
NEUROPSYCHOLOGICA

Received: 12.12.2013
Accepted: 02.06.2014

A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

DOI: 10.5604/17307503.1111842

THE LEVEL OF ANXIETY AND THE SUBJECTIVE ASSESSMENT OF THE QUALITY OF LIFE IN PATIENTS POST HIP REPLACEMENT AFTER PRIMARY AND SECONDARY REHABILITATION

Dorota Janikowska-Hołoweńko[1(A,B,C,D,E,F)], Katarzyna Zaborowska-Sapeta[2(A,B,D)], Ilona Bidzan[3(A,B,D,E,F)]

[1] Department of Rehabilitation, Kościerzyna Municipal Hospital, Dzierżążno, Poland
[2] Department of Rehabilitation, Faculty of Medical Sciences, University of Warmia and Mazury, Olsztyn, Poland
[3] St. Vincent a Paulo Hospital, Gdynia, Poland

SUMMARY

Background: The goal of our study was to determine if a predictable change occurs in the subjective assessment of the quality of life in the case of patients after hip replacement as a result of primary (time t1) and secondary (time t2) rehabilitation in terms of the level of pain felt, the assessment of physical activity, the feeling of health, assessing the possibility of returning to work; to determine whether there is a connection between the level of anxiety and the assessment of the quality of life in this group of patients.

Material/ Methods: We studied 40 patients treated in the Orthopedics and Traumatology Ward at the Kościerzyna Specialized Hospital, admitted to hospital in order to undergo hip replacement. They were qualified for the procedure of hip joint endo-prosthesisplasty due to hip joint degenerative disease, fracture of the neck of the femur, or aseptic necrosis of the head of the femur. There were 31 individuals admitted electively, and 9 admitted in emergency. The following instruments were used: an authorial survey form; the Harris Hip Score, to examine HRQOL; Spielberger's State-Trait Anxiety Inventory (STAI).

Results: After the end of rehabilitation, patients sense less severe pain, which means that they assess their quality of life as higher. Patients assess their physical activity better after reaching the end of rehabilitation. After reaching the end of rehabilitation, patients assess positive change in the subjective assessment of health. The subjective assessment of the level of pain after primary rehabilitation was not significantly correlated with the level of anxiety as a trait.

Conclusions: The level of anxiety as a trait significantly influences the subjective assessment of pain, but not at all moments of rehabilitation.A higher level of anxiety is connected with a lower subjective assessment of the possibility of returning to work during primary and secondary rehabilitation. Rehabilitation has a significant influence on decreasing pain and improving the subjective assessment of the state of health and physical activity after hip replacement.

Key words: orthopedic rehabilitation, pain management, HRQOL

INTRODUCTION

It is estimated that, in the countries of Western Europe, degenerative hip joint disease occurs in 3-11% of individuals older than 35, whereas in the group of individuals older than 60 the estimated occurrence of this disease is at the level of 60% (Czubak et al., 2010; Istrati et al., 2010; Iwaniszczuk et al., 2011; Świątczak, 2013; Zhang et al., 2005). The ageing of oursociety, which is closely connected with the occurrence of a number of chronic diseases, has had a substantial influence on the increase in the number of individuals with degenerative hip joint disease. However, statistics indicate that degenerative hip joint disease has begun to afflict ever younger individuals, too, which is caused by, first and foremost, a lifestyle conducive to the development of this disease, particularly in hip joints (which means, above all, a sedentary lifestyle), a constant decrease in physical activity, an inappropriate diet, obesity, the high level of stress, etc. (Iwaniszczuk et al., 2011).

Hip joint degenerative disease itself has had a very significant influence on the general state of health; it restricts daily activities and is connected with numerous complications, such as thromboembolism, diseases of the cardiovascular system and the respiratory system, obesity, and, in the longer term and in the case of older patients, dementia. Therefore, this ailment has become a significant clinical problem, substantially influencing the quality of life, insofar as it is determined by the state of health (Hoaglund & Steinbach, 2001; Christmas et al., 2002; Corti & Rigon, 2003; Mannoni et al., 2003; Stolarczyk et al., 2006).

Total hip joint prosthetic arthoplasty is the primary treatment applied in the case of patients with advanced hip joint degenerative changes (Stolarczyk et al., 2006). Hip replacement is one of the most common procedures applied in orthopedics, and is closely connected with the process of rehabilitation. The function of rehabilitation in after a hip endoprosthesis has been implanted is to restore fitness, so as to make it possible for a patient to fulfill their needs, including, among other things, self-care and the return to activities from the time before the surgical procedure, including those associated with work.

After hip replacement, a necessary element of treatment is rehabilitation, both early (primary) and late (secondary). During early rehabilitation, the possibility of applying exercises is most frequently governed by the limits of movement and pain in the operated hip joint. The rehabilitation of patients after endoprosthesis-plasty is commenced as soon as during the first day after surgery. In this case, what is applied is physical therapy, in order to eliminate existing muscle contractures and increase the range of movement in the joint by means of passive and supported exercises (and also active), as well as exercises aimed at improving muscle fitness. In the initial period after the procedure, there is also orthopedic equipment (e.g. elbow crutches, a walking frame, a walker or a cane), which enable the patient to move soon after the procedure, reducing the burden on the operated joint, as well as to make the patient stable, which prevents falls. Initially, the patient is taught isometric exercises of the femoral quadriceps of

both the operated and healthy limb, as well as gluteal and abdominal muscles. During the second or third day after surgery, it is recommended that the patient rise from the bed and walk with the use of crutches or a walking frame (without burdening the operated limb, in the case of patients after "cement-free" replacement, whereas full burdening is recommended, on the contrary, in the case of patients after "cement" replacement). Every day, new rehabilitation exercises are used, and the walking distance is increased, so as to start walking on stairs between the 5th and 7th day after surgery (with or without full burdening of the operated limb, depending on whether the prosthesis was cemented or cementless). This stage of rehabilitation may be defined as primary (early), and its effectiveness can be assessed during the last day of the patient's stay in hospital (Kubacki, 2004; Siwek & Kwiatkowski, 2001; Siwek & Kwiatkowski, 2003).

After about 4-6 months post surgery, patients are usually given several weeks of rehabilitation in a hospital rehabilitation ward (secondary rehabilitation). After this period, the patients usually achieve a good, pain-free range of movement in the operated joint, which results in restoring the normal functions of the lower limb. After that period (6-8 months post surgery), it is possible to assess the progress of secondary rehabilitation (Kubacki, 2004; Siwek & Kwiatkowski, 2001; Siwek & Kwiatkowski, 2003).

In recent years, in applied psychology and medical treatment, there has been more and more attention given to the concept of Health Related Quality of Life, HRQOL (e.g. Majkowicz, 2005; Wołowicka, 2001; Bidzan, 2008). This notion has been defined as the functional effect of a disease and its treatment as perceived (experienced) by the patient (Schipper, 1990). As reported by de Walden-Gałuszko (1997), HRQOL can more easily be defined as the assessment of one's own situation in life during a period of disease and treatment, taking under consideration the person's particular role. This is a particular useful way of examining the mood of particular patients or groups of patients, and estimating benefits or costs from medical interventions (Kiebert, 1997). Clinical observations lead to the conclusion that an identical diagnosis and treatment regime does not necessarily produce a comparable subjective assessment of the quality of their life. There are many factors that may play an intermediary role in making this assessment varied, one of which is anxiety.

Anxiety may be caused both by the diagnosis of a disease itself, and also by the necessity of being subjected to treatment, including surgery, both of which are situations stressful for patients, and both of which cause anxiety for most people. Anxiety is defined by Spielberger as an acquired behavioral predisposition which causes a broad range of objectively non-threatening situations to be perceived as threatening, and reacting to them with emotions that are excessive in proportion to the magnitude of the objective danger (Spielberger, 1970). Anxiety as a state is subjectively and consciously felt as unease that is connected with a somatic component: namely, the arousal of the autonomous nervous system. This state is unstable in nature, and is characterized by a substantial reactivity to changing conditions (Aouill, 2004a). Anxiety may have a different character

and course of varying intensity. It becomes chronic when the patient does not have the resources that would make it possible to eliminate the danger. A high level of anxiety has a destructive influence on the patient's involvement in processes aimed at restoring fitness, and appears to be a response to the danger that accompanies the necessity of attempting an invasive treatment (Aouill, 2004b). In respect to health and disease, the level of anxiety may influence the readiness to undergo treatment and rehabilitation.

In much of the scientific literature, a connection has been found between the quality of life and the burdensomeness of disease symptoms and limitations it causes in all spheres of functioning. In the case of patients with orthopedic problems, attention is given to pain, to physical limitations, and also to limitations in fulfilling various roles, above all those in the family (first and foremost, spouse, parent, child) and in professional life.

The goal of our study was:

- to determine if a predictable change occurs in the subjective assessment of the quality of life in the case of patients after hip replacement as a result of primary (time t_1) and secondary (time t_2) rehabilitation in terms of the level of pain felt, the assessment of physical activity, the feeling of health, assessing the possibility of returning to work;
- to determine whether there is a connection between the level of anxiety and the assessment of the quality of life in this group of patients.

Material and methods

In the study, we studied 51 patients treated in the Orthopedics and Traumatology Ward at the Kościerzyna Specialized Hospital, admitted to hospital in order to undergo hip replacement, in the period between 1 August and 30 November 2008. Ultimately, data obtained from 40 individuals, who participated in both of the stages of the study, were taken under consideration. They were qualified for the procedure of hip joint endo-prosthesisplasty due to hip joint degenerative disease, fracture of the neck of the femur, or aseptic necrosis of the head of the femur. There were 31 individuals admitted electively, and 9 admitted in emergency. The number of women participating in the study was N=31, and the number of men was N=91; the average age in the study group amounted to M=61.13. All these individuals, after making themselves familiar with the manual, expressed their consent to participate in the study.

The following instruments were used:

- an authorial survey form;
- the Harris Hip Score, to examine HRQOL;
- Spielberger's State-Trait Anxiety Inventory (STAI).

The survey developed by the authors included basic personal data, information about employment, a scale for the subjective assessment of health (where –5 meant a very poor state of health, and + 5 a very good one), and a scale for the subjective estimation of the possibility of returning to work (full or partial ability/total disability). The survey included written consent by the patient to participate in the study and for its results to be used for scientific purposes.

To assess the quality of life, we used the Harris Hip Score, which is a well known and commonly used scale that assesses treatment outcome and selected aspects of the quality of life in patients after hip replacement (Wall & Dragan, 2006; Harris, 1969; Harris, 1972; Nilsdotter & Bremander, 2011). Several years of practice and numerous studies have confirmed its credibility and usefulness (Soderman & Malchau, 2001).

The total Harris Hip Score scale is composed of 4 subscales assessing, in turn, pain (from 0 to 44 points; the higher the number of points, the lower the level of pain), functionality and activity (from 0 to 47 points, where 0 means minimal physical activity, and 47 means maximum physical activity), the deformation of the hip joint (maximum 4 points) and the range of movement (maximum 5 points).

Due to the goal of our study, we took under consideration the first two subscales: pain and functionality/activity, whereas the last two scales (deformations and the range of movement) were not taken under consideration, since it is hard for a patient to measure the necessary angles objectively. This modification did not influence the number of points, nor did it change the criteria of assessment, because the results were not calculated for the entire scale.

The STAI serves to assess the intensity of the level of anxiety as both a state and a trait, and is the most commonly applied method used to assess the level of anxiety. This tool is composed of two scales:

- X1 – used to measure anxiety as a state,
- X2, which measures the level of anxiety as a trait.

In the present study, we used X2 (STAI-X2) was used to assess anxiety as a trait.

The study was conducted in two stages. The first was conducted between the 10^{th} and 12^{th} day after hip replacement, and after the end of primary rehabilitation (time t_1). The patients used the Harris Hip Score to indicate the level of pain and physical activity, and then completed the survey and the STAI X-2 questionnaire. The second stage of the study was conducted 6-8 months after hip replacement. At that time, the individuals participating in the study were subjected to secondary rehabilitation at hospital rehabilitation wards or in an ambulatory system. They were examined at their place of residence. The patients again used the Harris Hip Score to indicate the level of pain and physical activity, and completed the survey and the STAI X-2 questionnaire.

RESULTS

The level of pain

The mean level of subjectively sensed pain in the first stage of the study – after primary rehabilitation – was 23.75 (SD = 14.86), whereas in the second stage of the study it was 34.65 (SD = 11.11), which means a statistically significant reduction in the level of pain felt ($t=3.66$, $p<0.001$). After the end of rehabilitation, patients sense less severe pain, which means that they assess their quality of life as higher (Figure 1).

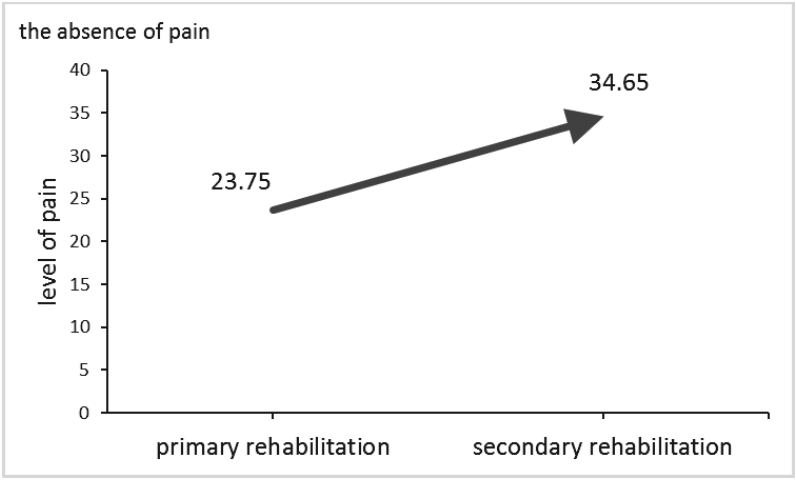

Fig. 1. The subjective assessment of felt pain after primary and secondary rehabilitation

The level of physical activity

The mean level of the subjective assessment of physical activity in the first examination after primary rehabilitation was 17.73 (SD = 9.66), while in the second examination, after secondary rehabilitation, it was 32.28 (SD = 10.57). This result is statistically significant (t=6.85, p<0.001), and means that patients assess their physical activity better after reaching the end of rehabilitation (Figure 2).

The subjective assessment of health

The mean subjective assessment of health after primary rehabilitation was 7.90 (SD=2.58), and after secondary - 9.75 (SD=1.41). This result is statistically significant (t=4.053, p<0.001), and means a positive change in the subjective assessment of health after reaching the end of rehabilitation (Figure 3).

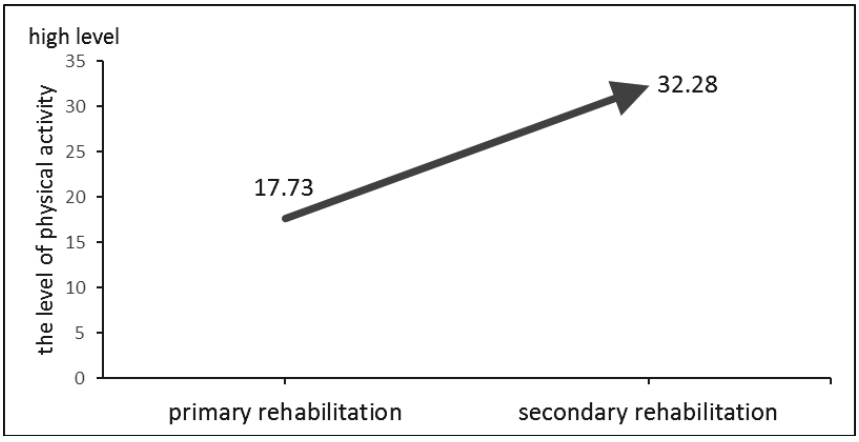

Fig. 2. The subjective assessment of physical activity after primary and secondary rehabilitation

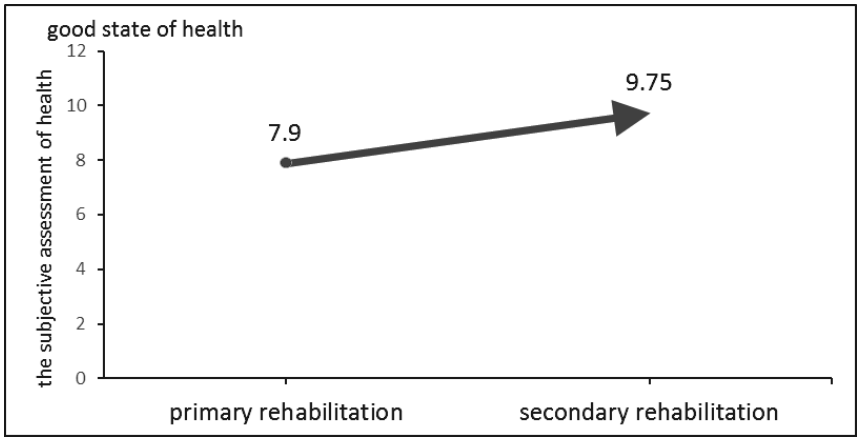

Fig. 3. The subjective assessment of health after primary and secondary rehabilitation

Estimating the possibility of returning to work

The mean subjective assessment of the possibility of returning to work after primary rehabilitation was 2.63 (SD=0.59), and after secondary - 1.98 (SD=0.86). This decrease is statistically significant (t= – 5.342, p<0.001). A change occurred in the subjective assessment of the possibility of returning to work (now assessed as lower) as a result of rehabilitation, which means that after reaching the end of rehabilitation, patients assess the possibility of returning to work (Figure 4) as lower.

The level of anxiety and the assessment of the quality of life.

As can be concluded from Table 1, the subjective assessment of the level of pain after primary rehabilitation was not significantly correlated with the level of

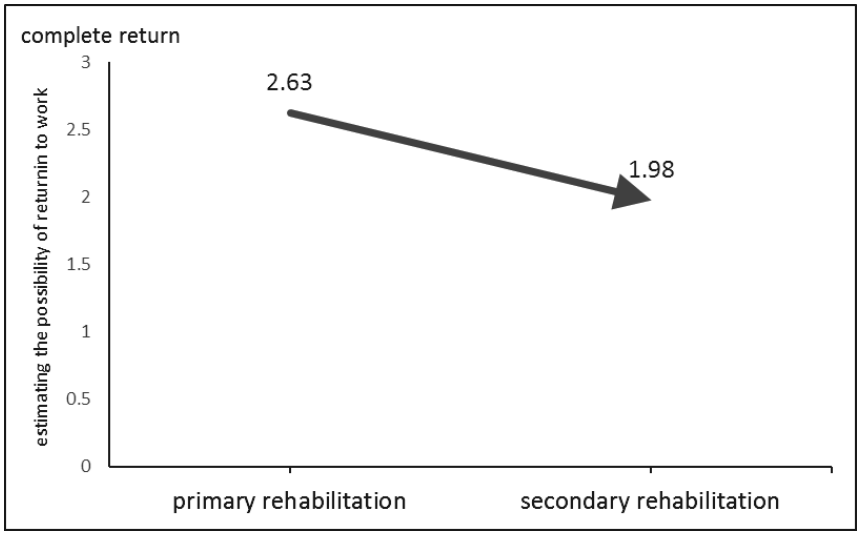

Fig. 4. The subjective estimation of the possibility of returning to work after primary and secondary rehabilitation

Table 1. The values of the correlation coefficient between the level of anxiety and the assessment of the quality of life

QOL indicators	primary rehabilitation r	secondary rehabilitation r	comparison of correlation coefficients p
Subjective assessment of pain	– 0.140	– 0.428**	not significant
Subjective assessment of health	– 0.466 **	– 0.080	0.07
Assessment of activity	– 0.114	– 0.174	not significant
Assessment of the possibility of returning to daily activities	– 0.331*	– 0.450**	not significant

*p < 0.05
** p < 0.01

anxiety as a trait. In turn, after secondary rehabilitation, patients with a higher feeling of anxiety assessed the intensity of pain as higher. This correlation was statistically significant (r= –0.428, p< 0.01).

The subjective assessment of physical activity was not correlated with the level of anxiety, after either primary or secondary rehabilitation.

The subjective assessment of health was negatively correlated with the level of anxiety only after primary rehabilitation (r= -4.666, p<0.01). After secondary rehabilitation, the result was statistically insignificant (p>0.05). That means that the higher the level of anxiety, the lower the subjective assessment of the state of health after primary rehabilitation.

The subjective estimation of the possibility of returning to work was negatively correlated with the level of anxiety after both primary rehabilitation (r= –0.333, p<0.05) and secondary (r= –0.450, p<0.01). Patients with a higher level of anxiety assessed the possibility of returning to work after reaching the end of the rehabilitation less positively.

DISCUSSION

In both medicine and clinical psychology, the assessment of HRQOL is currently considered crucial for the assessment of one's own situation during a period of disease and treatment, and, by the same token, for estimating the benefits or costs resulting from medical interventions (Widuchowski et al., 2004; Stolarczyk et al., 2006; Bidzan, 2008). The attempt to assess the quality of life of patients after hip replacement, in most cases, takes under consideration connections

with psychological factors that can significantly modify the assessment of the quality of life (cf. e.g. Heszen & Sęk, 2007; Bidzan, 2008; Iwaniszczuk et al., 2011). Hip replacement is currently regarded as the most effective method of treatment, and results in significant improvement, in respect to both the range of the functions of the hip joint, and relief of the pain connected with the disease, and raises the comfort level when performing daily activities, which is conducive to a higher assessment of the quality of life (Stolarczyk, Mitek & Nagraba, 2006; Kopeć & Kusz, 2008). In the present study, the subjectively felt pain was higher in the first measurement, which means after primary rehabilitation, in comparison with the second measurement, after secondary rehabilitation. This means that rehabilitation resulted in improvement in the extent of subjectively felt pain, which is in accord with the results of clinical studies by other authors (Stolarczyk, Mitek & Nagraba, 2006). Our analysis also showed that the assessment of pain was correlated with the level of anxiety only after secondary rehabilitation. The process of rehabilitation effectively reduces pain, but anxiety causes increased pain even after secondary rehabilitation. This result may mean that anxiousness exacerbates the experience of pain, particularly later on, i.e., after reaching the end of rehabilitation. Antalgesic actions are for patients a significant factor improving the quality of life; therefore, it is recommended that psychotherapy be added to the process of treatment. Nilsdotter et al. (2002), in their study to assess the quality of life in case of patients after hip replacement, used the Western Ontario and McMaster Universities Osteoartritis Index (WOMAC) scale, and also the Short Form 36 (SF 36), from which they obtained very low results in the case of 33% of their patients in the subscale assessing pain. They ascertained that there is a connection between the assessment of the quality of life and pain and age, which means, the older one was and the higher the level of pain, the lower the assessment of the quality of life. In our study, due to the goal we set, the large age range, and differences in the number of age group members among our subjects, data concerning age were not taken under consideration.

The next study variable was the subjective assessment of physical activity. The analysis of the empirical data showed a significant increase in subjectively assessed physical activity after secondary rehabilitation. Stolarczyk, Mitek, and Nagraba (2006) proved that the mean activity level of patients after hip replacement, measured objectively by a physician, was very similar to the results obtained in our first measurement. After secondary rehabilitation, there was a significant increase in the subjective assessment of physical activity. In a study by Jachimowicz-Wołoszynek et al. (2003), the physical functioning of patients after hip replacement, measured 6 months after the procedure, was also better. These results prove that the process of rehabilitation improves the subjective and objective assessment of physical activity.

In reference to the psychological variableof anxiety, no connection was found in the present study between the subjective assessment of physical activity and the level of anxiety. Most likely, the co-occurrence of hip replacement and rehabilitation improve physical activity on their own, which is not connected with

a psychological factor such as the level of anxiety. Stolarczyk, Mitek, and Nagraba (2006) propose that physical activity be assessed in an objective way, rather than subjectively, because, in their opinion, the objective measurement is much lower than declared activity in a subjective measurement. The results we obtained, in comparison with the results obtained by the above-mentioned authors, do not confirm this claim. However, it is difficult to measure the level of anxiety, intensification of pain or activity in a highly-individualized way. These factors, however, influence the functioning of an individual, particularly in the case of disease. In studies on individuals with tumor or cardiological disease, much more frequently than in the case of patients with orthopedic ailments, psychological factors such as anxiety are taken under consideration. Due to the character of neoplasm or cardiological ailments, the anxiety connected with death appears more frequently in social consciousness. Therefore, it is not possible to compare results obtained from these groups of patients with those which are obtained by patients with chronic diseases.

Another variable we studied was the subjective assessment of health. The results showed that rehabilitation did significantly improve the subjective assessment of the state of health. This assessment is connected with the level of anxiety, but only after primary rehabilitation. The results suggest that the role of anxiousness in the subjective assessment of health after secondary rehabilitation is smaller. In this case, psychological therapy should be conducted just after surgery, in order to reduce anxiety, which may have a positive influence on the subjective assessment of health in this period of treatment.

Another aspect of the present study was the subjective estimation of the possibility of returning to work or daily activities. The results of our study show that in this respect there was a statistically significant decrease in the estimation of the possibility of returning to work or daily activities as a result of rehabilitation. Anxiety as a trait was, in this aspect, significantly correlated in both of the measurements (after primary and secondary rehabilitation). These results indicate that the higher the level of anxiety as a trait, the lower the assessment of the possibility of returning to work/daily activities. Therefore, the role of rehabilitation and of time was negligible. It seems that anxiousness may be a strong determinant of the subjective estimation of the possibility of returning to work or daily activities. The psychotherapy of anxiety in the course of the entire process of rehabilitation, both primary and secondary, could improve the subjective assessment of the estimation of returning to work and daily activities. Following up on the present study, attention should also be paid to the area of the hope invested in treatment and rehabilitation, and also expectations connected with treatment.

The present study confirms that total hip replacement as a method of surgical treatment of the advanced stages of ailments of the hip joint, along with primary and secondary rehabilitation, fulfill their essential tasks, providing patients with improvement in the quality of life, which is in accordance with the results of studies by other authors (e.g. Jachimowicz-Wołoszynek et al., 2004; Widuchowski et al., 2004). Anxiety as a trait is involved as an intermediary factor in the as-

sessment of the quality of life in respect to the subjective assessment of pain and the subjective estimation of the possibility of returning to work,but not at all stages of rehabilitation.

CONCLUSIONS

1. The level of anxiety as a trait significantly influences the subjective assessment of pain, but not at all moments of rehabilitation.
2. A higher level of anxiety is connected with a lower subjective assessment of the possibility of returning to work during primary and secondary rehabilitation.
3. Rehabilitation has a significant influence on decreasing pain and improving the subjective assessment of the state of health and physical activity after hip replacement.

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Address for Correspondence
Dorota Janikowska-Hołoweńko
Starodworcowa 27A/C/5
81-575 Gdynia, Poland.
e-mail: dorota.holowenko@interia.eu