



## QUALITY OF LIFE IN PATIENTS WITH TOTAL HIP REPLACEMENT – A PILOT STUDY

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### ABSTRACT:

**Introduction:** Total hip joint replacement is the most frequent surgery intervention for the treatment of degenerative diseases. Rehabilitation after surgery plays an instrumental role for functional recovery and returning to the labor market or daily activities. Although postsurgical pain and function improvement are widely explored, there is no focus on other aspects of life influenced by total hip replacement. The most used instruments for quality of life measuring are specific ones, but a number of disadvantages lead to the need for broad-ranged concept.

**Aim:** to evaluate the quality of life in total hip replacement patients undergoing a personalized rehabilitation program and to define its influence on physical, psychological, social and environmental dimensions of life.

**Material and methods:** A personalized rehabilitation program was applied for 7 days in 19 patients who underwent conventional total hip replacement surgery. Quality of life was measured on the first and the last day of their hospital stay by using the WHOQOL-BREF questionnaire.

**Results:** Significantly improved QOL total score was reported for all participants after the rehabilitation course. Comparing QOL in domains shows statistically significant improvement in all of them except “Social relationships.”

**Conclusion:** Early rehabilitation with an individual approach could achieve QOL improvement in different life aspects of THR patients. WHOQOL-BREF could be a useful tool for quality of life assessment after rehabilitation surgical interventions such as total hip replacement.

**Keywords:** total hip replacement recovery, WHOQOL-BREF, deep oscillations,

### INTRODUCTION

Total hip replacement is a major surgery intervention with great importance for individuals suffering from degenerative joint diseases. Total hip replacements (THRs) are increasing as the aging population grows [1]. The goal of postsurgical rehabilitation is to improve the function of the affected joint and to help for returning to the labor market or to daily activities. The development of THR surgery requires an adequate rehabilitation protocol is focused on functional recovery, social adaptation and personal satisfaction from the healthcare services [2, 3, 4].

There are some controversial points of view according to the appropriate physical therapy modalities for each of the rehabilitation stages. Most authors recommend that physical therapy should be avoided in the early stage of rehabilitation in order to avoid complications such as joint dislocation and tromboembolia [4, 5]. On the other hand, there are some evidence indicating that deep oscillations is an effective method for reducing pain, inflammation and swelling in the early rehabilitation stage following joint arthroplasty [6].

Pain management and functional recovery after THR are widely explored [7], but there is no research focus on a broader range of influence of THR on life, or such concepts are less evident. Discussing outcomes beyond pain and function generates a more holistic understanding of the recovery, relevant to the individual [8, 9, 10].

WHO defines the quality of life (QOL) as “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” [11]. This philosophy is based on the impact of illness on life in four dimensions – physical health, psychological health, social relationships, environment [12]. Two types of indicators could be used for quality of life assessment in THR patients, according to the purpose of the study. Specific tools are related to functional recovery – pain, range of motion, gait, daily activities. The most used instrument for functional assessment after THR is Harris

Hip Score [13]. It consists of patient reported outcome component and physician-assessed range of motion. Although a self-reported outcome component only, called modified Harris Hip Score, is available, the main disadvantages of this tool are its narrow range and no validation in the Bulgarian population [14, 15].

THR encompasses different personal feelings, activities and expectations, which makes it difficult to dichotomize individuals for analysis. Although QOL is a construct helping to unify heterogenic groups for research purposes, the assessment by using generic instruments is not familiar to most clinicians than pain and function. The best known generic instrument for QOL assessment is WHOQOL – BREF, but its reliability for THR patients has never been demonstrated in Bulgarian country [16, 17].

**AIM:**

To evaluate QOL in THR patients undergoing personalized rehabilitation program and to define its influence on physical health, psychological health, social relationships and environmental aspects of life. We hypothesized that the personalized rehabilitation program improved QOL bias in physical health.

**MATERIAL:**

The study was conducted in the Department of Rehabilitation at University Hospital “St.Marina”, Varna, after approval from the Commission for Scientific Research Ethics of Medical University –Varna. Patients who underwent conventional THR were admitted for 7 days rehabilitation course 1-4 weeks after surgery, following early rehabilitation protocol applied at the Orthopaedic and Traumatology clinic. Non consenting patients were excluded from the study. WHO QOL-BREF were given to all included patients on the first and the last day of hospital stay. The

hospital rehabilitation program consists of: deep oscillations (in case of contraindications, DO were excluded)) and kinesitherapy (isometric exercises, isotonic exercises, suspension, crutch walking education, gait training exercises).

**METHODS:**

1. Medical data collecting (patient’s history).
2. Sociological methods:
  - 2.1. Socio-demographic data collecting; WHO-BREF questionnaire before and after the rehabilitation program);
  3. Statistical methods - statistical data grouping, Chronbach’s test, statistical hypothesis testing. The data is processed with SPSS v.19.0 for Windows.

**RESULTS and DISCUSSION:**

*Socio-demographic characteristics.*

The number of patients included in the study was 19 (13 females and 6 males), ages 18-65 were involved in the study. The causes for THR were identified as follows: Primary hip joint osteoarthritis – 14; Fracture – 2; Aseptic necrosis of the femoral head – 2; Congenital dislocation of hip – 1. Comorbidity was reported in all participants.

*Quality of life measurement.*

Cronbach alpha = 0.918, which means strong reliability for THR patients. We found a statistically significant improved total QOL score in 58% of cases with a variation of 10-54% comparing results before and after the rehabilitation program.

Statistical hypothesis testing showed significant improvement in physical health, psychological health and environment, with no difference regarding social relationships.

The mean value of the *physical domain* at the admission was 7,79, and that of patients discharged was 13,32 (table 1)

**Table 1.** Paired Samples Statistics (physical domain)

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Physical domain_admission	7,79	19	2,323	0,533
	Physical domain_discharge	13,32	19	2,451	0,562

A weak positive correlation (0.198) was reported between the indicators “Physical domain at admission” and

“Physical domain at discharge” scores, but the relationship was statistically insignificant ( $p=0.417>0.05$ ) (table 2)

**Table 2.** Paired Samples correlations (physical domain)

		N	Correlation	Sig.
Pair 1	Physical domain_admission & Physical domain_discharge	19	0,198	0,417

1. The null hypothesis H0 is defined, which states that there is no statistically significant difference

The alternative hypothesis H1 states that a statistically significant difference exists.

2. A significance level of  $\alpha=0.05$  (5% risk of error) is assumed at a probability guarantee of  $p=95\%$ .

3. A t-test is used.

4. The accepted level of significance  $\alpha=0.05$  (5% risk of error) at a guaranteed probability  $p=95\%$ , and the estimated cutoff level of significance Sig (p) are compared

5.  $p=0.000 < \alpha=0.05$ , therefore from the theory of statistics, it can be concluded that the null hypothesis H0 is

rejected and the alternative is accepted, and therefore there is a statistically significant difference in the Physical domain regarding patients on admission and upon discharge (table 3)

**Table 3.** Paired Samples Test (physical domain)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Physical domain_admission Physical domain_discharge	-5,526	3,025	0,694	-6,984	-4,068	-7,963	18	0

The mean value of the *psychological domain* at admission was 10.68, at that of patients at discharge 12.47 (table 4)

**Table 4.** Paired Samples Statistics (psychological domain)

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Psychological domain_admission	10,68	19	3,742	0,859
	Psychological domain_discharge	12,47	19	3,08	0,707

A strong positive correlation (0.770) was reported between the psychological domains at admission and the psychological domains at discharge. The relationship was statistically significant ( $p=0.000<0.05$ ). (table 5)

**Table 5.** Paired Samples Correlations (psychological domain)

		N	Correlation	Sig.
Pair 1	Psychological_domain_admission Psychological_domain_discharge	19	0,77	0

1. The null hypothesis H0 is defined, which states that there is no statistically significant difference

The alternative hypothesis H1 states that a statistically significant difference exists.

2. A significance level of  $\alpha=0.05$  (5% risk of error) is assumed at a probability guarantee of  $p=95\%$

3. A t-test is used

4. The accepted level of significance  $\alpha=0.05$  (5% risk

of error) at a guaranteed probability  $p=95\%$ , and the estimated cutoff level of significance Sig (p) are compared

5.  $p=0.004 < \alpha=0.05$ , therefore, from the theory of statistics, it can be concluded that the null hypothesis H0 is rejected and the alternative is accepted, and therefore there is a statistically significant difference in the Psychological Area block regarding patients on admission and upon discharge. (table 6)

**Table 6.** Paired Samples Test (psychological domain)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Psychological domain_admission Psychological domain_discharge	-1,789	2,394	0,549	-2,943	-0,636	-3,258	18	0,004

The mean value in the *social relationships domain* at admission was 8.32, and that of patients at discharge 8.11 (table 7)

**Table 7.** Paired Samples Statistics (social relationships)

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Social relationships_admission	8,32	19	2,262	0,519
	Social relationships_discharge	8,11	19	2,233	0,512

A strong positive correlation (0.906) was reported between social relationships at admission and social relationships at discharge scores. The relationship was statistically significant ( $p=0.000<0.05$ ) (table 8)

**Table 8.** Paired Samples Correlations (social relationships)

		N	Correlation	Sig.
Pair 1	Social relationships_admission & Social relationships_discharge	19	0,906	0

1. The null hypothesis H0 is defined, which states that there is no statistically significant difference. The alternative hypothesis H1 states that a statistically significant difference exists.
2. A significance level of  $\alpha=0.05$  (5% risk of error) is assumed at a guaranteed probability of  $p=95\%$
3. A t-test is used
4. The accepted level of significance  $\alpha=0.05$  (5% risk of error) at a guaranteed probability  $p=95\%$ , and the estimated cutoff level of significance Sig (p) are compared
5.  $p=0.360 > \alpha=0.05$ , therefore, from the theory of statistics, it can be concluded that the null hypothesis H0 is accepted, and therefore there is no statistically significant difference in Attitude block regarding patients on admission and on discharge. (table 9)

**Table 9.** Paired sample test (social relationships)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Social relationships_admission Social relationships_discharge	0,211	0,976	0,224	-0,26	0,681	0,94	18	0,36

The mean value of the the *Environment domain* at admission was 24.26, and that of patients at discharge 25.89. (table 10)

**Table 10.** Paired Samples Statistics (environment)

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Environment - admission	24,26	19	3,572	0,82
	Environment_discharge	25,89	19	3,035	0,696

A strong positive correlation (0.889) was reported between the 'Environment at Admission' and 'Environment at Discharge' indicators. The relationship was statistically significant ( $p=0.000<0.05$ ). (table 11)

**Table 11.** Paired Samples Correlations (environment)

		N	Correlation	Sig.
Pair 1	Enviornment_admission & Environment_discharge	19	0,889	0

1. The null hypothesis H0 is defined, which states that there is no statistically significant difference. The alternative hypothesis H1 states that a statistically significant difference exists.
2. A significance level of  $\alpha=0.05$  (5% risk of error) is assumed at a guaranteed probability of  $p=95\%$
3. A t-test is used
4. The accepted level of significance  $\alpha=0.05$  (5%

risk of error) at a guaranteed probability  $p=95\%$ , and the estimated cutoff level of significance Sig (p) are compared

5.  $p=0.360 > \alpha=0.05$ , therefore, from the theory of statistics, it can be concluded that the null hypothesis H0 is accepted, and therefore there is no statistically significant difference in Attitude block regarding patients on admission and on discharge. (table 12)

**Table 12.** Paired sample test (environment)

Pair 1	Environment_admission Environment_discharge	Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
		-1,632	1,64	0,376	-2,422	-0,841	-4,336	18	0

The comparison of QOLscores before and after the personalized rehabilitation program showed significantly improved QOL in domains 1,2, 4 but not in domain one. Functional improvement in the hip joint range of motion was reported for all THR patients. Similar to the results of other researchers, our study shows validity in surgical interventions such as THRs.

### CONCLUSION:

Rehabilitation medicine aims not just to recover from specific diseases but to provide overall healing and resocialization. Personalized rehabilitation protocol, including a combination of physical modalities (deep oscillations) and kinesitherapy, applied in the early stage after surgery, could impact different aspects of life in addition to functional recovery. WHO-QOL BREF scores mean a reflection of every aspect of individuals being and could be used as a single tool for recovery monitoring after THR and setting person oriented rehabilitation programs.

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