

To the Chairman of the Scientific Committee, definitely  
by order No. P 109-234 /11.04.2023  
By the Rector of MU-Varna

## **REVIEW**

**by Prof. Dr. Nedelcho Tzachev, MD, PhD**

**Head of the Department of Orthopedics, Traumatology, Reconstructive Surgery and  
Physiotherapy , Military Medical Academy, Sofia**

**Regarding:** Procedure for acquiring an educational and scientific degree of the ESD "PhD" in the field of higher education 7. "Health and sport", by professional direction 7.1. "Medicine", scientific specialty "Physiotherapy, resort medicine and rehabilitation".

**Author:** Dr. Denitsa Nedelcheva Grozdeva, PhD student in a independent form of education at the Department of "Physiotherapy, Rehabilitation and Thalassotherapy"

**Title:** "Rehabilitation and quality of life in patients after total hip arthroplasty "

The submitted documents hard and soft copies are in accordance with the rules for the terms and conditions for acquiring scientific degrees and holding academic positions at the University of Varna. No plagiarism or evidence of plagiarism was identified during the review of the submitted PhD project.

### **Brief biographical data and professional development**

Dr. Denitsa Nedelcheva Grozdeva was born in the city of Varna in 1976. In 2001, she completed her medical education at the Medical University of Varna, and in 2009 acquired a specialty in Physical and Rehabilitation Medicine. From 2010 to the present, she holds the academic position of "lecturer" at the Medical University of Varna, at the Department of "Conservative Dentistry and Oral Pathology". In the period from 2009-2017, the candidate worked as a PRM physician at Balneotherapy Center-Tuzlata G, Balchik, and from 2014 to the present as a PRM specialist at the UMDC of the University of Varna. From 2021, she is a PhD student in independent form at the Department of "Physiotherapy, Rehabilitation and Thalassotherapy".

Dr. Denitsa Grozdeva has successfully completed several courses in the field of Physical and Rehabilitation Medicine such as "Electrodiagnostics and electrostimulation, 2010; Dental Physiotherapy, 2010; Laser Therapy, 2011; Manual Medicine 2013; Acupuncture, 2013; Ayurvedic Medicine, 2018; Trainer of Traditional Chinese Medicine, 2019; Mediation, 2020; and Cupping therapy, 2022. The Ph.D. candidate teaches dental medicine students from Bulgarian and English-language parallel, as well as Kinesitherapy students at MU-Varna. Dr. Denitsa Grozdeva speaks Russian and English language.

### **Scientific relevance and importance of the PhD thesis**

Dr. Grozdeva's dissertation is competently and comprehensively written. Rehabilitation and quality of life in patients after total hip arthroplasty still continue to be an extremely relevant issues for both rehabilitation medicine and orthopedics, and having a global impact on health care and insurance systems. Hip arthroplasty is one of the greatest achievements and challenges of modern orthopedics, also considered as the "operation of the century" according to Learmonth et al. Its development is associated, on the one hand, with the biomechanical and bioengineering achievement of prostheses, but also with the tremendous growth of the elderly population worldwide as well as in Bulgaria. The increased life expectancy during the last three decades requires the application of complex medical approaches to ensure the full functioning of the individual in society. Self-assessment QOL tools are rarely used by Bulgarian clinicians and do not appear in the instruments mainly accepted by the Bulgarian NHIF for reimbursement of health services, as well as in the several models for monitoring the outcomes of the various rehabilitation interventions. Nowadays, PRM is faced with the serious challenge on one hand to catch up with kinesitherapeutic practices and on the other hand to synchronize its points of view regarding the stages of rehabilitation adopted by the kinesitherapeutic community.

### **Structure, design and visualization of the dissertation**

The dissertation is written on 126 standard typewritten pages, 24 tables, and 1 figure. It is properly structured in the following main sections: introduction, literature review, objective tasks, subject of the study, material and methods, results, discussion, contributions, recommendations to institutions, and references. The reference is up-to-date and covers 134 literary sources, of which 81 are in Latin and 53 are in Cyrillic. Almost all the references are current, with more than half (95 titles) from the last ten years.

### **The literature review**

The literature review is properly structured, detailed, and divided into four subchapters. In the first sub-chapter entitled "Hip endoprosthetics. A holistic approach to the problem" the PhD candidate emphasizes the need for an interdisciplinary approach in patients after total hip arthroplasty and the subsequent process associated with their recovery. Some of the leading causes of persistent pain in these patients are mentioned. The most common complications after conventional total hip arthroplasty are presented, such as luxation of the arthroplasty joint, aseptic loosening, periprosthetic fractures, and peri-implantitis. The dissertation investigated the patient's satisfaction with the health care received, the support from the family environment, the role of some personal factors in the patient's recovery, as well as work process factors, such as static and dynamic workload and psycho-social factors. In the second sub-chapter "Rehabilitation – essentials. Peculiarities in hip arthroplasty patients. International and Bulgarian experience", the PhD candidate presents the basic principles of rehabilitation in detail. The focus is on the specifics of rehabilitation after total hip arthroplasty, incl. the requirements of a clinical pathway 265. The

effectiveness of home-based rehabilitation, as well as its underutilization in Bulgaria, is emphasized.

In the third sub-chapter entitled "Quality of life in patients after total hip arthroplasty", the Ph.D. candidate comprehensively examines the phenomenon of quality of life and the most frequently used assessment tools regarding this pathology, such as WOMAC, SF-36, WHOQOL-Brief, Euro QOL 5 Dimensions, WHO QOL 100, Harris Hip Score.

Finally, the literature review ends with a subsection entitled "Patient-centered approach and hip arthroplasty" in which the benefits of introducing the patient-centered approach in the rehabilitation of this type of patient are described. Additionally, the role of PRM specialists in the rehabilitation process of patients after hip arthroplasty is highlighted.

### **Aim and tasks**

The aim of the Ph.D. thesis is precisely and clearly formulated, i.e., to investigate the changes in the quality of life in patients after hip arthroplasty who underwent an individual rehabilitation program under the conditions of a 7-day stay funded by the Bulgarian National Health Insurance Fund (NHIF), on clinical pathway 265, as well as to assess their social adaptation, such as to 6 tasks were identified for the purpose, which in the process of the exhibition were developed in detail, and efficiently fulfilled.

### **Material and methods**

This part of the dissertation is distinguished by a comprehensive review of the present study. The methodical approach used is modern and adequate for the fulfillment of the aforementioned aim and tasks. The study included 72 individuals treated in the Rehabilitation Department of the "Estreya" Hotel, according to clinical pathway 265, with ICD Z96, within 7 procedural days. The socio-demographic characteristics of the investigated persons are presented in their distribution by age, gender, workability, education, employment, marital status, residence, and income. Statistical methods are also described in detail and analyzed using Statistical Software Package (SPSS Inc., Chicago, IL, USA) for Windows version 19.0.

The results of the clinical study conducted are presented in depth and reasoned in 24 tables, with no figures to illustrate them. For a one-year period (June 2021 - May 2022), 72 inpatients of the Rehabilitation Department at the "Estreya" Hotel, according to clinical pathway 265, ICD Z96.6, were followed. The Ph.D. student analyzed the distribution of patients, by the main diagnosis leading to endoprosthetic, type, and duration of endoprosthetic; leading to complaints. The results of the quality of life assessment measured with the WHOQOL-BREF questionnaire are presented in detail, at admission and discharge, by following domains: physical, psychological, relationships, and environment.

### **Discussion**

The discussion is characterized by completeness and thoroughness in the analysis of the results achieved from the study. For a one-year period (June 2021 - May 2022), the Ph.D. candidate reported a significant improvement in the quality of life for all patients, both in general for all inpatients (72 persons) and particularly for each patient separately, underwent rehabilitation treatment in the Rehabilitation Department at the Hotel " Estreya", according to clinical pathway 265, ICD: Z96.6 within 7 treating days. The dissertation presented in detail the socio-demographic characteristics of the included subjects – their distribution by age, gender, workability, education, employment, marital status, children, residence, and income.

The distribution of the included subjects according to the type and duration of endoprosthetic was also analyzed; the main diagnosis leading to arthroplasty; led to complaints. The results of the quality of life assessment measured with the WHOQOL-BREF questionnaire are presented in detail - at admission and at discharge, by domains - physical, psychological, relationships, and environment. Special attention is paid to the role of the PRM specialist, orthopedist, and the various members of the multidisciplinary rehabilitation team.

### **Conclusions and scientific contributions**

The personal participation of Dr. Denitsa Grozdeva in the conducted research is indisputable. The conclusions she reaches are 9 and have a logical sequence based on the competent analysis of the results. The Ph.D. candidate has identified a total of 6 contributions, 3 of which have a theoretical-methodological nature and 3 practical-applied ones.

I accept as credible and evidence-based the following contributions:

- For the first time in our country, a validated self-assessment QoL questionnaire was applied before and after an individualized complex rehabilitation program in patients after conventional total hip arthroplasty;
- The effectiveness of early inpatient rehabilitation on the quality of life in this kind of pathology is proven;
- A model of organization of rehabilitation for these patients is suggested, including pre-operative preparation.

### **Abstract and scientometric indicators**

The abstract is properly structured and contains 69 pages and 24 tables, and it includes the main elements of the dissertation work and the obtained results. In connection with the Ph.D. thesis Dr. Denitsa Grozdeva presented one full-text publication and participation in a scientific forum.

### **Critical issues and recommendations**

The following critical comments and recommendations can be made to the presented dissertation:

In the present PhD thesis figures are missing which is a strong limitation for the visualization of the results obtained.

- The references should be standardized and unified. Some of them there are incomplete and other incorreccted cited, such as: # 10, 11, 31, 40, 43, 54, 58, 65, 79, 81, 84, 97, 99, and 112. Moreover, other in other reference it not becomes clear who the author or the organization issued.
- The PhD candidate avoided to mention the difficulties and limitations she encountered during the realization of her research. It is important to note that the present study was conducted in pandemic conditions and imposed general and local anti-epidemic restrictions also applicable to medical facilities.
- Another strong limitation was the single-center and non-randomized nature of the study.
- The number of dropped patients is missing, which could have a different interpretation.
- The PhD student used a single assessment tool for QoL, WHOQOL-BREF, despite its non-specific natuter, which is not widely used in subjects after THA, according to an up-to-date search in the databases (Pubmed/Medline and Scopus). The results obtained would be more significant if they were combined with another tool, e.g. the visual analogue scale (VAS), however this may be applied in next stage of the study.
- I recommend the PhD student to remove technical omissions and errors such as e.g. the abbreviation TEP, which must appear throughout the text, instead of the abbreviation TEPP in places.
- The critical comments made do not change the positive assessment of the obtained results and contributions of the present dissertation. They aimed to improve the present PhD thesis.

**Conclusion:**

I believe that Dr. Denitsa Grozdeva's dissertation entitled "Rehabilitation and quality of life in patients with hip arthroplasty", in terms of relevance, volume of development and significance of the contributions, fully meets the requirements of the the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), and the Regulations of the Medical University of Varna for its application . In connection with the above-mentioned, I confidently give my positive vote and i suggest to the respected members of the scientific committee to award Dr. Denitsa Nedelcheva Grozdeva an educational and scientific degree "Doctor" in the field of higher education 7. Health care and sports; professional direction 7.1. "Medicine", scientific specialty "Physiotherapy, resort medicine and rehabilitation".

19/05/2023 г.

Reviewer:

**Prof. Dr. Nedelcho Tzachev, MD, PhD**

