Functions and physical functioning after total knee arthroplasty surgery

Knee osteoarthritis (OA) is a globally occurring health problem, which leads to complaints like pain and joint stiffness that influence all daily activities. As a consequence, participation in sports, work and social activities decreases. When conservative treatment options, such as life style advice, exercise and medication are no longer effective, a surgical approach (total knee arthroplasty [TKA]) is necessary.[1-4] The increase in life expectancy and relevant comorbidities such as obesity, next to a widening of surgical criteria and improved safety lead to an increase in the number of TKA surgeries.[5-7] Consequently, an increase in the social and financial burden on the whole community is to be expected. Interventions to minimize this burden of TKA surgery on individuals and society should be investigated. Next to this, it is necessary to translate research outcomes from these interventions into practice to improve the availability of evidence to health care providers and patients. This translation is known as knowledge valorisation and refers to the "process of creating value from knowledge, by making knowledge suitable and/or available for social (and/or economic) use, and by making knowledge suitable for translation into competitive products, services, processes and new commercial activities" (adapted definition based on the National Valorisation Committee 2011:8).

In this chapter we translate the results of this dissertation to the relevance for society and the individual patient.

RESULTS AND RELEVANCE

This dissertation reports on the functioning of patients in the Netherlands after a TKA surgery. Although, some residual complaints remain on functioning level, patients improve on all 'International Classification of Function, Disability and Health' (ICF) domains and differences in relevant outcome domains with healthy persons become smaller. Remarkable outcomes are the remaining muscle strength deficits after TKA surgery, which could cause or be intermediate factors for problems at activity level. Therefore, in our pilot training study we investigated the impact of progressive strength training on the quadriceps and hamstring muscle strength and in functioning level. We were only able to find an impact on the muscle strength.

Next to the performance of patients after a TKA-surgery, we found a high reproducibility and responsiveness of the patient specific function scale in this patient population. Therefore, this is an ideal too in individual tailored treatment to define personal goals. Ideally, important activities which are difficult to perform are defined pre-surgically, health care providers get insight in patient's expectations of TKA surgery and could advise and educate them appropriately if necessary. After surgery, individual-tailored post-surgical rehabilitation should focus on these important activities, next to training of basic motor skills. In our opinion this process will improve the satisfaction of the patients.

TARGET GROUPS

Patients with knee OA or a TKA

Patients with knee OA or a TKA are the main target populations of this dissertation. In our opinion they may profit most of this knowledge, since information regarding results of TKA surgery, satisfaction rates and the post surgical functional ability are very important in the information gathering process before surgery. Further, this information could be used to adapt patients' expectations and reach agreement with the surgeon's expectations. When using measurement instruments like the Patient Specific Functional Scale (PSFS), unrealistic expectations may be discussed and adapted if needed. Next, it addresses the importance of adherence to (supervised) exercise therapy to optimize their individual rehabilitation process, based on their predefined goals and expectations. In our opinion this information may be already provided to the patients during pre-surgical group-information sessions or individual consultations.

Physical therapists

Therapists can use the information provided in this dissertation in multiple ways. First, by using our data as a benchmark with the data of their patients. Second, by using the data for personalized goal setting and evaluation of progression. Third, they can use the overall results to inform their patients about potential health improvements after TKA surgery. Fourth, this dissertation emphasizes the need for more attention towards measurement in a broader sense.

Medical doctors, including orthopedic surgeons

The results of this dissertation can be of use to family physicians as well as orthopedic surgeons, since with the knowledge obtained from this dissertation, they could better inform patients regarding the course and results on functioning level. Besides, they can benchmark their patients' rehabilitation progression towards this Dutch population.

Researchers

This dissertation describes the functional status of a TKA patients in the Netherlands. This could stimulate researchers worldwide to compare their own populations and outcomes with the results provided in this thesis. Besides, the fact that the quadriceps and hamstring muscle strength remains inferior compared to healthy individuals' strength, it could enhance other researchers to investigate interventions to improve strength. Further, the effect of a progressive strength training program should be confirmed in a larger trial. At last, the impact of physical therapy could be investigated specifically, since post surgical rehabilitation is different in the Netherlands compared with other countries.

Health policy makers and health care insurers

Health policy makers and health care insurers are the last target group of this dissertation since designing cost-effective knee osteoarthritis and TKA peri-surgical programs is of ongoing importance, especially given the high prevalence of osteoarthritis. Small adjustments in the peri-surgical process to increase functional abilities could therefore lead to less disabilities and higher social and work related participation and therewith lower the social and financial burden.

Other innovations like an online platform with information for patients and healthcare professionals may further enhance the independency of patients. In a secure online environment patients, therapists and surgeon could inform each other, which may contribute to consistent and clear information and communication. Possibly, group therapy could be valuable, because patients can share complaints and questions, this makes them less dependent on health care providers or the internet. [8, 9] Next to the focus on functional training, optimal training of basic motor skills should not be forgotten during therapy sessions or independent training. Together, we think this could further increase muscle strength, reduce residual complaints and improve overall satisfaction rate.

Lastly, the information of this dissertation can be used as benchmark data for both, single health care practices and in general.

REFERENCES

1. KNGF-richtlijn Artrose heup-knie [https://www.fysionet-evidencebased.nl/images/pdfs/richtlijnen/artrose_heup_knie_2018/artrose_heup-knie_verantwoording_2018.pdf]
2. Welke aandoeningen hebben we in de toekomst? [https://www.vtv2018.nl/aandoeningen]
3. Artrose, Cijfers en Context [https://www.volksgezondheidenzorg.info/onderwerp/artrose/cijfers-context/huidige-situatie#node-prevalentie-en-aantal-nieuwe-gevallen-van-artrose]
4. Priority Medicines for Europe and the World 2013 Update [http://www.who.int/medicines/areas/priority_medicines/Ch6_12Osteo.pdf]
5. Bourne RB, Chesworth BM, Davis AM, Mahomed NN, Charron KD: Patient satisfaction after total knee arthroplasty: who is satisfied and who is not? Clin Orthop Relat Res 2010, 468(1):57-63.
6. Pozzi F, Snyder-Mackler L, Zeni J: Physical exercise after knee arthroplasty: a systematic review of controlled trials. Eur J Phys Rehabil Med 2013, 49(6):877.
7. Ghomrawi HM, Mancuso CA, Westrich GH, Marx RG, Mushlin AI, Group EDS: Discordance in TKA expectations between patients and surgeons. Clin Orthop Relat Res 2013, 471(1):175-180.
8. Goldsmith LJ, Suryaprakash N, Randall E, Shum J, MacDonald V, Sawatzky R, Hejazi S, Davis JC, McAllister P, Bryan S: The importance of informational, clinical and personal support in patient experience with total knee replacement: a qualitative investigation. BMC Musculoskelet Disord 2017, 18(1):127.
9. Marks R: Knee osteoarthritis and exercise adherence: a review. Current aging science 2012, 5(1):72-83.