

## KOOS Questionnaire Assessing Value of Physical Therapy Outcomes in the Case of Patients with Ligament Injuries of the Knees Addressed Surgically

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### Abstract

The high frequency of this lesion among the youth who practice various recreational sports and the necessity of postoperative functional recovery have determined to follow the efficiency of kinetotherapy programs in a number of 10 patients with an average age of 27,7. For evaluation, we have used the KOOS (Knee Injury and Osteoarthritis Outcome Score) scale, in order to appreciate especially the patient's perception on the degree of recovery accomplished by his/her knee; this scale contains criteria linked to the specific pain, to the daily, sportive or recreational activities that the patient can conduct. In all the 5 subscales, we have obtained extremely significant differences from a statistical point of view between the initial and final evaluations – ES ( $p < 0.001$ ).

**Key words:** *anterior cruciate ligament, knee, rehabilitation*

### Rezumat

Frecvența mare a acestei leziuni în rândul tinerilor care practică diferite sporturi de agrement și necesitatea recuperării funcționale postoperatorii m-a determinat să urmăresc eficiența programelor de kinetoterapie la un număr de 10 pacienți având vârsta medie de 27,7 ani. Pentru evaluare am utilizat scala KOOS („Knee Injury and Osteoarthritis Outcome Score”) pentru a aprecia în special percepția pacientului asupra gradului de recuperare pe care l-a realizat genunchiul său, conținând criterii legate de durerea specifică, de activitățile cotidiene, sportive sau recreative pe care le poate efectua individul respectiv. La toate cele 5 subscale am obținut diferențe extrem de semnificative din punct de vedere statistic între evaluarea inițială și cea finală – ES ( $p < 0.001$ ).

**Cuvinte cheie:** *ligament încrucisat anterior, genunchi, recuperare*

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## Introduction

The rupture of the anterior cruciate ligament has become the most common musculoskeletal lesion, with an annual incidence of 32/100 000, while in the case of athletes it can reach 70/100 000. [1]

Capsulo-ligamentar device ruptures of the knee represent a common pathology among active young people, especially those who practice professional sports but also sport as a means of recreation to which we refer in this paper. [2]

By knowing the kinetic techniques and methods of posttraumatic recovery, we formulated the following hypothesis of this research, conducted as an experiment: it is assumed that using kinetic techniques and manoeuvres in a preoperative and postoperative program will improve much more joint mobility and muscle strength of both athletes and those who practice the sport occasionally making their return to sports activity be made more quickly than when applying only the posttraumatic recovery treatment. [3]

The objective of this paper is to evaluate the efficiency of a program of functional re-education of the knee, conducted in an ambulatory, after the surgical reconstructions of the LIA lesions in the case of patients who practice sports only recreationally.

## Material and method

The study was conducted from December 2011 and June 2012 in the County Hospital no. 1 Timisoara, Clinic I Orthopaedic Traumatology – kinetherapy and medical recovery section, on a number of 10 patients, 2 female and 8 male, aged between 20 and 37, with an average age of 27,7. None of them practice professional sports; all of the 10 patients practice sports during their free time and their injury was produced when they practiced the following sports: football – 5 cases, skiing – 2 cases, tennis –

2 cases, squash – 1 case. The diagnosis established was LIA rupture in 8 cases and LIA + meniscus rupture in 1 case. The way these traumas were produced in all the 10 cases is injury by falling.

**The distribution of patients by age groups** was as follows: 5 patients aged 20-25, 1 patient aged 26-30, 2 patients aged 31-35 and 2 patients aged over 36.

**The distribution of the patients according to the affected knee:** lesions at the level of the right knee were encountered in the case of 7 patients, while the left knee was affected in 3 cases.

The objectives of the recovery are obviously based on the clinicofunctional aspect of the articulation in focus and they refer especially to: pain, inflammation, motility, ability, stability.

In order to evaluate the patients, we have used the KOOS (Knee Injury and Osteoarthritis Outcome Score) scale, which was designed as an instrument for appreciating the patients' opinions on the problems of the affected knee and their consequences on their way of life. KOOS can be used both on a short term (to appreciate the weekly changes induced by a certain treatment or recovery program) and on a long term (years) in order to notice the changes produced by a trauma or an arthritic process.

The KOOS scales uses 5 subscales regarding: pain – P, symptoms (besides pain) – P, activities of daily living – ADL, the knee's functionality in sportive and recreational activities (SP), the influence of the affection on quality of life – QOL. The answer to the questions of each subclass must refer to the last week prior to the test.

Evaluations were conducted initially (at the beginning of the recovery program), after 1 month and after 3 months; for the statistical evaluation, the initial results and the final results (after 3 months) were compared.

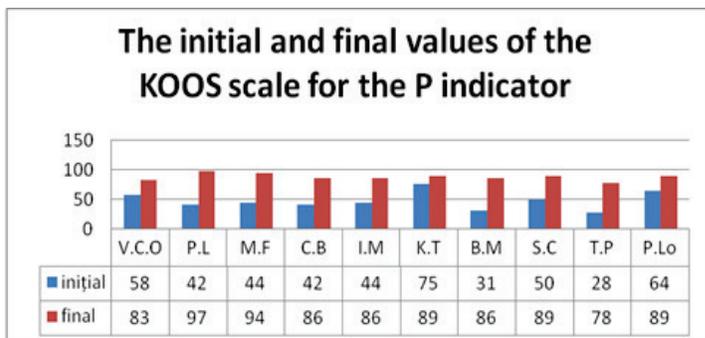


Figure 1. The initial and final values of the KOOS scale for the P indicator

Following the analysis of the KOOS scale, the for the P indicator we have noticed that the value obtained in the t Student test is  $p = 9,10 \times 10^{-6}$ , which from a statistical point of view indicates extremely significant differences - ES ( $p < 0.001$ ) (figure 1).

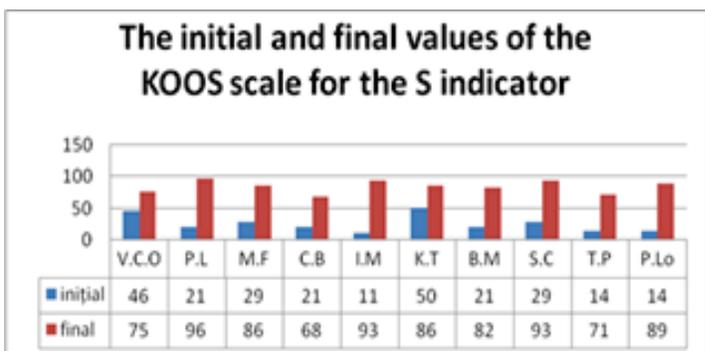


Figure 2. The initial and final values of the KOOS scale for the S indicator

Following the analysis of the KOOS scale, the for the S indicator we have noticed that the value obtained in the t Student test is  $p = 1,95 \times 10^{-6}$ , which from a statistical point of view indicates extremely significant differences- ES ( $p < 0.001$ ) (figure 2).

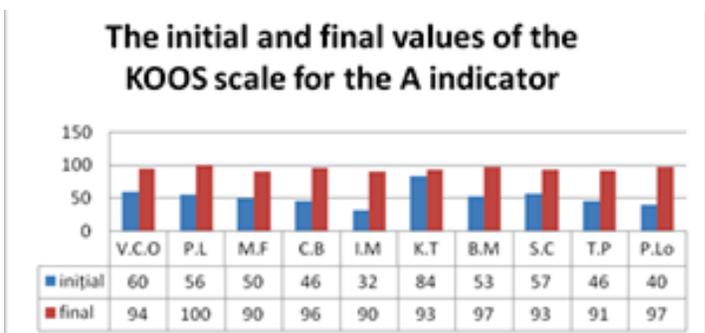


Figure 3. The initial and final values of the KOOS scale for the A indicator

Following the analysis of the KOOS scale, the for the A indicator we have noticed that the value obtained in the t Student test is  $p = 5,74 \times 10^{-6}$ , which from a statistical point of view indicates extremely significant differences- ES ( $p < 0.001$ ) (figure 3).

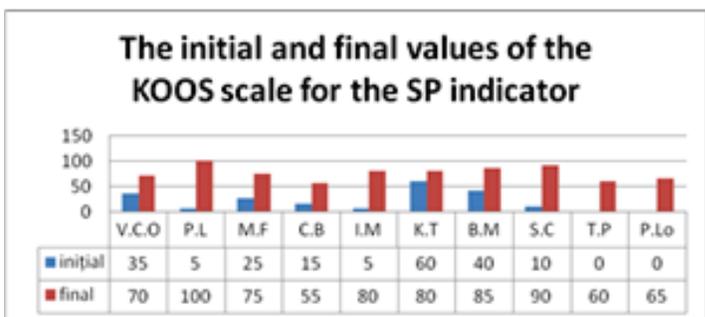
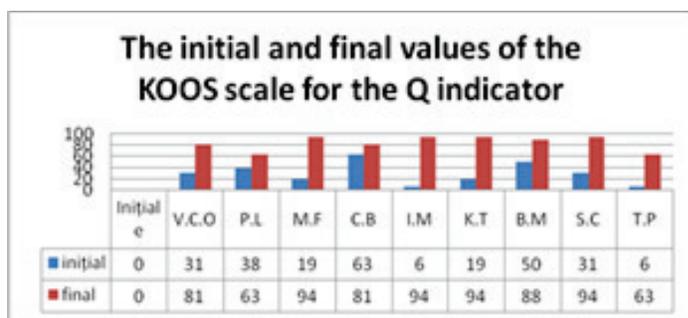


Figure 4. The initial and final values of the KOOS scale for the SP indicator

Following the analysis of the KOOS scale, the for the SP indicator we have noticed that the value obtained in the t Student test is  $p = 2,66 \times 10^{-5}$ , which from a statistical point of view indicates extremely significant differences- ES ( $p < 0.001$ ) (figure 4).



**Figure 5.** The initial and final values of the KOOS scale for the Q indicator

Following the analysis of the KOOS scale, the for the Q indicator we have noticed that the value obtained in the t Student test is  $p = 3,07 \times 10^{-5}$ , which from a statistical point of view indicates extremely significant differences - ES ( $p < 0.001$ ) (figure 5)

### Discussions and conclusions

The KOOS was developed in the '90 as a tool for the evaluation of the patients opinion about their knee affection. In this paper it has been used for a group of patients, but it can also be used for a single patient. Since 1998 the KOOS has been compared to other evaluation tools (4, 5). In this paper the questionnaire was applied for the evaluation of the postoperative results and it has been noticed an improvement of the studied parameters. Thanks to the use of two different scales it can also be applied before kinetotherapy or chirurgical intervention (5). The advantage of this appreciation is that it offers information for the following consultation. The KOOS can be used on short or long term, thus it can be measured the changes determined by medication or physical activity during a week or during a month. So it can be noticed what brings to posttraumatic arthritis (6). Thanks to its simplicity and efficacy the KOOS has been extended and it can be applied to children, to athletes (8, 9) and to people who do not practice regularly any kind of physical activity (7). Roos and co. have used this questionnaire on a group of 50 people (between 37 and 79 years old) with no signs or symptoms of any kind of knee injury (10).

A very important advantage of the KOOS is that it includes two different scales for measuring the physical activity and rehabilitation. It can be used in research for the evaluation and monitor groups of

people who practice different types of physical activity.

The functional re-education after the surgical plasty of the anterior cruciate ligament can be conducted in an ambulatory, upon exiting the orthopaedic service and is based on a well-defined and simple protocol, which includes a series of kinetic techniques.

An efficient, controlled physical activity program conducted progressively under a close supervision, has a beneficial effect on the physical condition, together with the kinetic treatment of preoperative and postoperative recovery, efficient in re-establishing the functionality of the given segment.

From a muscular point of view, one must insist on improving the function of the hamstrings, which are true protectors of the ligament plasty, without forgetting the sural triceps and quadriceps. The resumption of other sports which do not require the graft can be made starting with the 3<sup>rd</sup> month (marathon, cycling, swimming). It must also be mentioned that the patient's will of conducting a good recovery is determined for a good result. The initiation of recovery as soon as possible after the operation is very important.

In conclusion, in the case of the studied lot, an improvement of joint motility at the level of the affected knee has been noticed, which made possible the resumption of the physical activities

conducted before the injury after approximately 3 months.

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