

Effects of lower extremity strength training on physical recovery in patients underwent total knee replacement

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Background: Osteoarthritis patients after surgery had experienced physical function decrease and impact their quality of life. However, they always lack a long-term, home-style, and continuous legs exercise training methods, and rare study to explore the effects on physical recovery and quality of life after exercise training.

Purpose: To examine the effects of lower extremity muscle strength training on patients' physical recovery and quality of live underwent total knee replacement (TKR).

Methods:

- quasi-experimental design was conducted, and using a simple randomize sampling. Participants were distributed into with a lower extremity muscle strength training and the training started before surgery (experimental group, n=100) or with usual care (control group, n=100).
- The lower extremity strength training was conducted by a nurse practitioner.
 - Outcome measurement: the Knee injury and osteoarthritis outcome score (KOOS)
 - examined outcome: before surgery (T1), 2 weeks (T2), 1 month (T3), 2 months (T4), and 3 months (T5) after TKR.

Results:

- The KOOS subscales scores showed that all the two groups' patient experienced physical function (ADL and sport & recreation) and quality of life decreased at the two weeks after received TKR, but all the subscales scores gradually increased from one month to third months after TKR ($p < .001$).
- The generalized estimating equation (GEE) tests showed that both group and time were significantly different, indicated that both group patients experienced physical function and quality of life improvement, however, the exercise group physical function and quality of life was early recovery and better than no exercise group physical function and quality of life after TKR.

Table. Two groups mean improvement in outcome from baseline to three month (N=200)

Items	All participants Mean (SD)	Training group (n=100) Mean (SD)	Non-training group (n=100) Mean (SD)	Test*	P value
Pain	27.94(16.14)	31.50(16.16)	24.39(15.39)	3822.0	.004
Symptoms	26.29(19.27)	29.79(19.18)	22.79(18.81)	4118.5	.031
ADL	24.21(18.61)	29.31(18.36)	19.10(17.49)	3384.0	<.001
Sport & recreation	8.88(11.56)	11.40(11.89)	6.35(10.68)	3637.5	.001
QoL	22.81(17.61)	28.38(17.26)	17.25(16.21)	3104.5	<.001

Abbreviations: ADL, Active daily living; QoL, Quality of life.

*Test by Mann-Whitney U

Conclusion:

- The study confirmed that after lower extremity muscle strength training exercise helps to improve the quality of life and physical function recovery in patients who undergone TKR.
- This results recommend for the healthcare staff embed this training into pre-surgical nursing care and patients' discharge plan in care of TKR patient as a continuous daily rehabilitation activity at home.