

## The Effects of 12 Weeks of Non-Face-to-Face Real-Time Lower Body Neuromuscular Exercises on Gait, Physical Function, and Quality of Life in Women in 50s and 60s with Degenerative Knee Osteoarthritis

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**Abstract :** The purpose of this study was to examine the effects of 12 weeks of non-face-to-face real-time lower body neuromuscular exercises on gait, physical function, and quality of life in women in 50s and 60s with degenerative knee osteoarthritis. These women had not participated in an organized exercise program in the prior six months, had no illness that deterred them from receiving exercise tests and resistance exercise interventions and were not on a special diet. Eighteen subjects were divided into the neuromuscular exercise group (NEMEX: n=8, 1 dropout) and the control group (CON: n=8, 1 dropout) in a randomized controlled trial. The NEMEX group participated in an online lower body NEMEX intervention by watching and following YouTube Live. The exercise intervention consisted of three sections: a 5-minute warm-up including walking and active stretching; a 30-minute weight-bearing exercise including pelvic lift, slide lunge, stepping lunge, step-ups, and chair stands for 30 minutes; and a 5-minute cool-down including walking and inactive stretching. The weight-bearing exercises such as pelvic lifts, slide lunges, step lunges, step-ups, and chair stands were repeated for 3 sets, 12 times per set. Total exercise time was approximately 40 minutes a day, 4 times a week for 12 weeks. The control group was asked to maintain their normal life patterns during the same intervention period. All data from this study were processed using SPSS PC+ for Windows (version 25.0). Mean and standard deviation were used to illustrate the descriptive statistics of the dependent variable of the two groups. Repeated two-way ANOVA was performed to simultaneously analyze the difference in means between the two groups and the pre-/post-intervention time periods. If the main effect of the group, the main effect of the pre-/post-intervention periods or the interaction between the group and the time period were significant, a paired t-test was performed to analyze the difference between the time periods of each group, and an independent t-test was performed to analyze the difference between the two groups within each time period. All statistical tests were run with a significance level ( $\alpha$ ) of .05. In the NEMEX group, after 12 weeks of 4 times-weekly-lower body NEMEX interventions, there was a significant reduction of pain, increase in left step length, and improvement in physical function (40m fast-paced -walk, 30 seconds chair stand test). And also, there were improvements in stiffness, symptoms, function of daily living, and sports and recreational activities in the NEMEX group. In conclusion, 12 weeks of 4 times -weekly lower body NEMEX interventions would be beneficial for the improvement of gait, pain, and physical function in women in their 50s and 60s with degenerative knee osteoarthritis.

**Keywords :** gait, neuromuscular exercises, physical function, quality of life

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