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Effect of Otago Exercise Program on Motor Balance and Functional Status of Hemodialysis Patients: A Quasi-Experimental Study

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ABSTRACT

Introduction: Hemodialysis patients often experience skeletal complications due to mineral imbalances, resulting in impaired balance, increased risk of falls, and fractures. Researchers are investigating low-cost, effective interventions to enhance motor balance in this population. The Otago exercise program, comprising strength and balance exercises with progressive ankle cuff weights and multiple sets, alongside a walking regimen, has proven effective in fall prevention among the elderly. However, its efficacy and safety for hemodialysis patients must be explored. This study aimed to evaluate the impact of the Otago exercise program on motor balance and functional status in hemodialysis patients.

Methods and Materials: Seventy hemodialysis patients participated in this quasi-experimental study. Participants were selected using convenience sampling and assigned to control and intervention groups based on their dialysis sessions. Inclusion criteria were adults aged 18-75 years on hemodialysis for at least one year, capable of walking without mobility aids, and without lower limb musculoskeletal issues. Exclusion criteria included individuals with kidney transplants or those who missed more than three consecutive training sessions. The intervention consisted of Otago exercises performed for 30 minutes three times a week for 20 weeks. Balance and functional status were evaluated at three time points: before the intervention, 8 weeks after the intervention, and at 20 weeks. Data collection tools included a sociodemographic questionnaire, the 14-item Berg Balance Scale, the Four-Stage Balance Test, and the Katz Index of Independence in Activities of Daily Living. All tools were validated and reliable in Farsi. Data analysis used descriptive and analytical statistics, including the chi-square test, Fisher's exact test, and independent t-test.

Results: Based on an independent t-test, there was no difference between the age of control (mean = 52.54 ± 12.15) and intervention (mean = 48.31 ± 14.28) group (p = 0.187), and 54.3% of the participants were women. At baseline, there was no significant difference in motor balance between the two study groups, as indicated by the Berg Balance Test (p = 0.092) and the Four-Stage Balance Test (p = 1.00). The two groups were homogeneous regarding functional status, as measured by the Katz Index (p = 0.549). After eight weeks of intervention, a significant difference was found between the two groups, shown by the Berg Balance Test (p = 0.00) and the Four-Stage Balance Test (p = 0.00). Similarly, there was a significant difference in the Katz Index (p = 0.00). During the 20-week follow-up period after the intervention, there was a significant difference in motor balance between the two groups (p = 0.00) and in functional status based on the Katz Index (p = 0.001).

Conclusion and Discussion: The study reveals that the Otago exercise program significantly improves balance and daily activity performance in hemodialysis patients, suggesting that it is a potentially effective and safe intervention for enhancing motor balance and functional status in this population. However, further studies are needed to validate these findings fully.

Keywords: Exercise, Functional status, Renal dialysis

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