

Impact of a Wellness Recovery Program on Balance for Individuals with Parkinson's Disease

Abstract

The Parkinson's Wellness Recovery Program at Wake Forest Baptist Health is a community-based recreation therapy program that provides neuroplasticity principles of balance for participants with Parkinson's disease (PD). The program is designed to help individuals with PD restore and maintain functioning. A program evaluation to determine the efficacy of the program is currently underway. The evaluation uses a multiple single subject design that includes two weeks of baseline data followed by 12 weeks of intervention. This write up involves one study participant who completed both baseline data and four week program data before dropping out of the study. The write-up focuses on the balance measures results. The balance measures taken during the study are used to determine if the program helps individuals with PD improve balance and become less likely to fall. Results of the study found that the participant improved on the Five Times Sit-to-Stand test, but did not improve on the Timed Up and Go or the Timed Floor Transfer test. Since the study participant did not complete the 12 week program, it is difficult to determine the impact of the Parkinson's Wellness Recovery Program. The study will continue to study more participants to determine the effectiveness of this program.

Introduction

The Parkinson's Wellness Recovery Program (PWR) at Wake Forest Baptist Health in the Medical Plaza Miller Neuro Rehab Gym is a community-based Parkinson's exercise program led by Julie Bradwell, certified and licensed Recreation Therapist and certified PWR Moves instructor. The study is a multiple single subject design in which each participant of the study is new to the ongoing program so that baseline functioning prior to beginning the program can be established for each new participant. The inclusion criteria for this study is that the participant must have a diagnosis of PD. Exclusion criteria includes individuals who do not have a diagnosis of PD or have not been cleared medically to participate in the study. The program always begins with a warm up including the four main PWR Moves and is followed by an exercise in which participants are moving and active, and ends with a cool down at the end. The four basic PWR moves include an antigravity extension, "PWR! Up"; weight shifting, "PWR! Rock"; axial mobility, "PWR! Twist"; and transitions "PWR! Step" (Parkinson Wellness Recovery, 2018). The study will determine the efficacy of the PWR intervention.

Assessments

During baseline and testing weeks, balance is measured by three standardized balance measures including the Timed Up and Go (TUG) test (Podsiadlo & Richardson, 1991), Five Times Sit-to-Stand test (Csuka & McCarty, 1985), and the Timed Floor Transfer Test (Murphy, Olson, Protas, & Overby, 2003).

The TUG test is used to assess mobility including the client's ability to balance and fall risk. The client is asked to stand from a standard arm chair and walk three meters (10 feet) away from the chair (taped line) and then return to sitting in the chair. Older adults who take 12 or more

seconds to complete this task are at a higher risk of falling, and should receive interventions to improve their balance (CDC, 2018).

The Five Times Sit-to-Stand Test assess lower extremity strength, balance, fall risk and transitional movements. The client is asked to stand from a chair of standard height without armrests, and with his or her arms crossed over his or her chest five times in a row. For individuals with PD, they are considered a fall risk if it takes more than 16 seconds to stand and sit five times (Duncan, Leddy, & Earhart, 2011).

The Timed Floor Transfer test measures an older adults ability to sit on the floor and stand up from the floor to assess their risk of falling. According to Murphy et al. (2003)

A timed floor transfer is a clinical test of strength, flexibility, function, and problem solving; it measures the time necessary to transfer from standing to the floor and return to standing in any way that participants are able. Some elders overestimate their ability to perform this task (p. 69).

If an individual is unable to return to standing position without assistance, this is an indicator for fall risk (Murphy et al., 2003; Tinetti, Lui, & Claus, 1993).

Subjects

Participants in the study continue to be recruited from the outpatient program at Wake Forest Baptist Health. Individuals with a diagnosis of PD and who have been medically cleared to participate in a high intensity exercise program meet the entrance criteria to become a participant in this study. There is a study flyer that contains information about the program and how to contact the principal investigator who then sets up a meeting to review the study protocol and informed consent forms. Signed informed consent is obtained for each subject. A total of 6 participants will be recruited in this ongoing study. There is currently one participant who will be

evaluated for this paper; the participant met all criteria to be a part of this study. The participant completed four weeks of the study before dropping out.

Methods

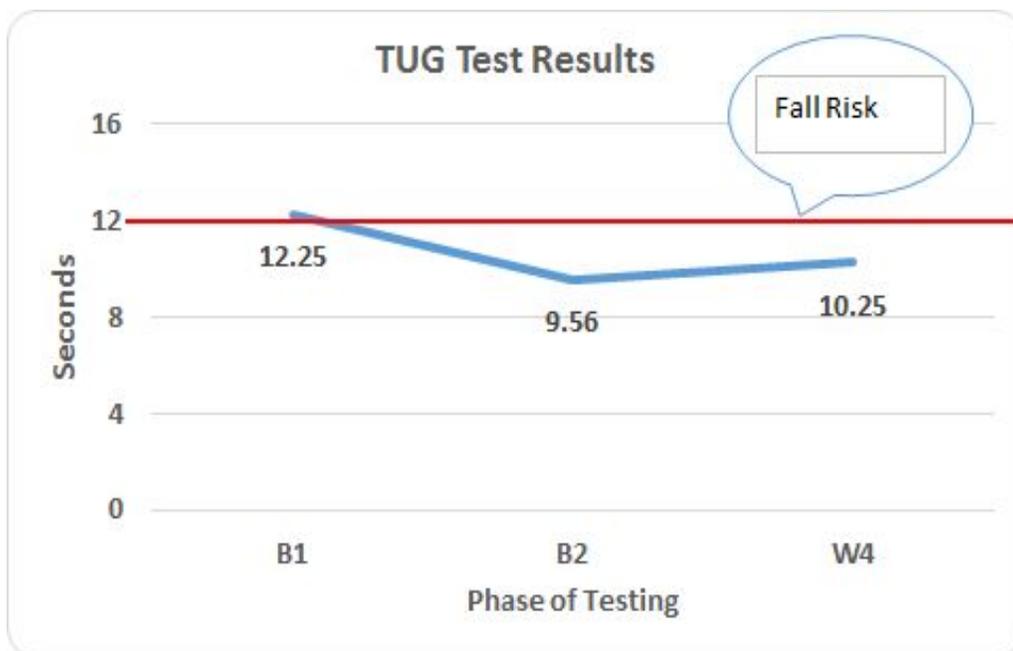
Prior to beginning the exercise program, participants are tested twice (over two weeks) to establish baseline functioning. Participants in the study complete a 12 week program and are tested at three intervals (weeks 4, 8 and 12) to measure any change in balance, health related quality of life, stress and social connectedness. Data is also gathered each time a participant comes to the program on whether or not they have fallen in the past week, the activities they have participated in, their attendance, how they are feeling physically, if they are experiencing pain, and their perceived balance prior to engaging in the exercise program. Current data analysis is based on the participant's three data points in terms of the balance scores.

Results

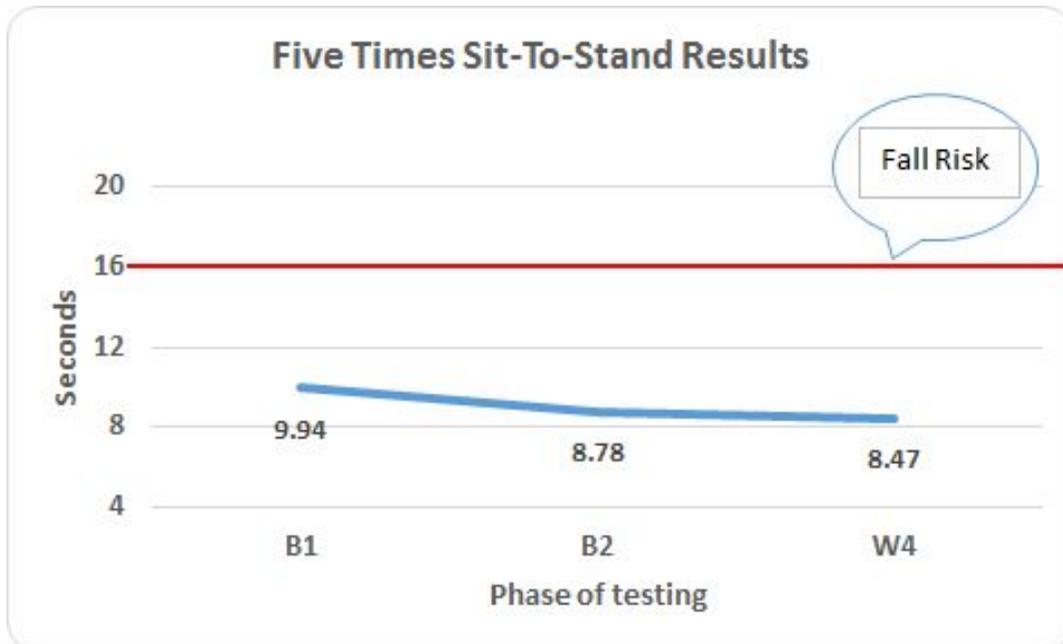
The participant was a female in her sixties and was diagnosed with PD approximately one year ago. She did not identify the Hoehn and Yahr stage of PD. She indicated she was more active rather than inactive in terms of physical activities but she did not identify specific activities she engaged in. Her reason for participating in the group was to increase her balance. She currently works and did not experience any significant mobility issues during her time in the program. However, her scores on the Perceived Stress Scale were relatively high with Baseline 2 score of 20 which indicates high stress. At week 4 testing, this reverted back to 16 (similar to Baseline 1) which is still higher than a score of 13 which is considered normal stress (Cohen, Kamarck, & Mermelstein, 1983). The participant completed a weekly journal once she started the intervention. She attended the program only on Thursdays due to her work schedule.

Participants were asked to rate their balance prior to and after the intervention using an 11-point Likert scale from 0 (Very Unsteady) to 10 (Completely Steady). She self-rated her balance prior to the intervention as “unsteady” (3) on Weeks 1 and 2 and rated her balance after the intervention on these same weeks as “more unsteady” (2) indicating her balance was more impaired after participating in the program. This changed on Week 3 where her balance before the program was rated “more unsteady” (2) and improved to “moderately steady” (5) after the intervention. Unfortunately, she did not complete the journal on Week 4.

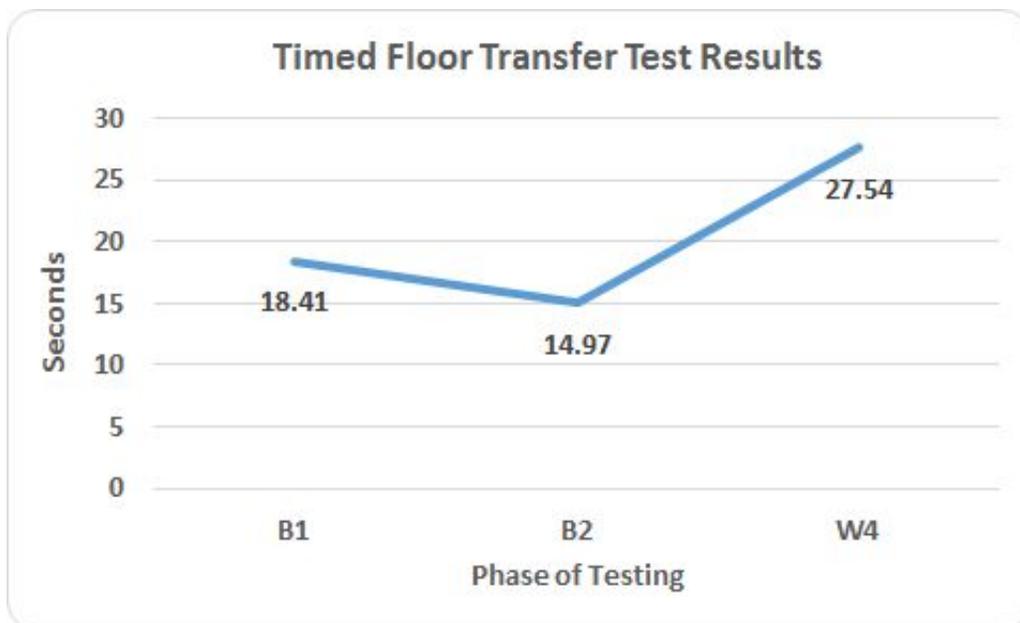
TUG Test. The participant completed the TUG test in 12.25 seconds during Baseline 1, which places the individual at risk for falls. The participant scored 9.56 seconds for Baseline 2, and 10.25 seconds for Week 4 testing. From Baseline 1 to Baseline 2, there was a decrease in time. From Baseline 2 to Week 4, there was a slight increase in time to complete the TUG test.



Five Times Sit-to-Stand. The participant completed the Five Times Sit-to-Stand test in 9.94 seconds for Baseline 1; 8.78 seconds for Baseline 2; and 8.49 seconds for Week 4. From Baseline 1 to Baseline 2, the participant's time decreased, and continued to decrease from Baseline 2 to Week 4 testing.



Timed Floor Transfer Test. The participant completed the Timed Floor Transfer test in 18.54 seconds at Baseline 1; 14.97 seconds at Baseline 2, and 27.54 seconds at Week 4 testing. The participant's time to complete the test from Baseline 1 to Baseline 2 decreased, and the participant's time to complete the test from Baseline 2 to Week 4 testing increased. Unfortunately the participant did not complete the weekly log to indicate her perceived balance prior to testing. Therefore, it is uncertain if her perceived balance prior to testing had declined based on her actual performance measure; this required more time to complete the task compared to Baseline 2. The large increase in time to completion of the Timed Floor Transfer test raises concern for fall risks.



Conclusions

The participant's results were inconsistent across the three balance measures. The participant's time decreased on the Five Times Sit-to-Stand test indicating an improvement in balance, transitions, lower extremity strength, and lower fall risk across the three testing periods.

The participant's time initially decreased from Baseline 1 to Baseline 2 then increased at Week 4 testing on the Timed Floor Transfer test. The time almost doubled from Baseline 2 to Week 4 (84% increase in time). These results indicate decreased balance and a higher fall risk than at baseline. Results of the TUG test indicates a decrease in score from Baseline 1 to Baseline 2 with a slight increase in score to Week 4 which was a 7% increase in time but still remains below the fall risk (12 seconds).

It is unclear at this point in time whether the participant would have improved on these measures since she only participated in three weeks of the program. The question remains whether her balance scores would stabilize or improve if she had continued in the 12-week program. The varying nature of PD may explain some of these perplexing/mixed performance measure results.

Future Implications

Although the PWR program was based on evidence based practices further studies need to be done to evaluate the effectiveness of the program for balance in individuals with PD. Due to the fact that only one study participant was available at the time of this analysis, no decisions can be made about the efficacy of the study at this time. The plan is to continue to evaluate the program with additional participants and will be re-evaluated once multiple participants have completed the program.

Bibliography

- Centers for Disease Control and Prevention (CDC), Stopping Elderly Accidents, Deaths & Injuries. (retrieved 2018). Assessment Timed Up and Go (TUG). Retrieved from: <https://www.cdc.gov/steady/pdf/STEADI-Assessment-TUG-508.pdf>
- Cohen, S., Kamarck, T., & Mermelstein, R., (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.
- Csuka, M., & McCarty, D. (1985). Simple method for measurement of lower extremity muscle strength. *The American Journal of Medicine*, 78(1), 77-81.
- Duncan, R., Leddy, A., & Earhart, G. (2011). Five times sit-to-stand test performance in parkinson's disease. *Archives of Physical Medicine and Rehabilitation*, 92(9), 1431-6. doi:10.1016/j.apmr.2011.04.008
- Murphy, M., Olson, S., Protas, E., & Overby, A. (2003). Screening for falls in community-dwelling elderly. *Journal of Aging and Physical Activity*, 11(1), 66-80. doi:10.1123/japa.11.1.66
- Parkinson Wellness Recovery: a division of NeuroFit Networks, INC. (2018). Retrieved from <http://www.pwr4life.org/>
- Podsiadlo, D., & Richardson, S. (1991). The timed "up & go": A test of basic functional mobility for frail elderly persons. *Journal of the American Geriatrics Society*, 39(2), 142-8.
- Tinetti, M.E., Lui, W.L., & Claus, E.B. (1993). Predictors and prognosis of inability to get up after falls among elderly persons. *Journal of the American Medical Association*, 269(1), 65-70.