"SILVER SNOWFLAKE" – PARKINSON'S FALL PREVENTION INITIATIVE

"SREBRNY PŁATEK" – INICJATYWA ZAPOBIEGAJĄCA UPADKOM PACJENTÓW Z CHOROBĄ PARKINSONA

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ABSTRACT

The "Silver Snowflake" initiative was created to educate globally Every Patient and Every Provider, about new research and intervention available to prevent falls in patients with Parkinson Disease (PD). The mission of this initiative is to internationally educate patients and families about causative factors of falls in Parkinson's patients and existing modalities that can be utilized to minimize the risk of falling. Creators of the initiative strive to make the education material free and available in other languages to raise global awareness. Provided education includes free webinar, posters and brochures currently available in English and Polish. Materials provided present anatomy and Parkinson's disease symptoms that cause patients to lose balance and make them at risk for falling. The suggestion on evidence based research exercises modalities that help prevent PD patients falls are also included. Education also highlights the importance of the home safety tip to prevent falls in patients with PD.

KEYWORDS: Parkinson, fall prevention, initiative, free education.

STRESZCZENIE

Inicjatywa "Srebrny Płatek" została stworzona z myślą o pacjentach z chorobą Parkinsona. Projekt ten ma na celu zapobieganie upadkom pacjentów dotkniętych chorobą Parkinsona poprzez właściwą edukację zarówno chorych, jak i ich opiekunów. Propagowanie wyników nowych badań oraz interwencji jest kluczowym faktorem przy zapobieganiu upadkom pacjentów z chorobą Parkinsona. Głównym celem tej inicjatywy jest powszechna (globalna) edukacja pacjentów i ich rodzin na temat czynników wpływających na/powodujących upadki u pacjentów z chorobą Parkinsona oraz na sposoby, które mogą być łatwo wykorzystane, aby zminimalizować ryzyko upadku. Twórcy inicjatywy "Srebrny Płatek" dążą do tego, aby wszelkie materiały edukacyjne dotyczące choroby Parkinsona były darmowe i łatwo dostępne w wielu językach, co wpłynęłoby na podniesienie globalnej świadomości dotyczącej choroby Parkinsona. Autorzy projektu przewidują różne formy przekazu edukacyjnego, m.in. bezpłatne webinarium oraz publikacje plakatów i broszur (obecnie dostępne w języku angielskim i polskim). Propagowane materiały prezentują anatomię i objawy choroby Parkinsona oraz wyszczególniają symptomy choroby odpowiedzialne za niestabilność postawy pacjenta i te, które bezpośrednio zwiększają zagrożenie upadkami. Obecne badania naukowe sugerują, że ćwiczenia fizyczne są niezbędne do zmniejszania ryzyka upadków. Materiały zawarte w tekście wskazują odpowiednie ćwiczenia, które pomagają pacjentom chorym na Parkinsona w zapobieganiu upadkom i kontuzjom. Problem bezpieczeństwa chorego w domu jest również poruszony, a porady szczegółowo opisane.

SŁOWA KLUCZOWE: choroba Parkinsona, zapobieganie upadkom, inicjatywa, darmowa edukacja.

Introduction

Parkinson's Disease (PD) prevalence is on the rise. According to the Parkinson's Disease Foundations, an estimated 60,000 Americans are diagnosed each year with PD [1]. Many current evidence based studies have shown that falls are common in Parkinson's disease. The clinical impact of falls is significant, often leading to a debilitating fear of reoccurring falls. Costs associated with post falls care are substantial. Falls are a serious problem among those with neurologic disorders like Parkinson's. This growing concern was supported by recently collected statistical data in the state of the science paper written by Allen, Schwarzel, & Canning in 2013 [2]. They show that 60.5% of Parkinson

patients reported at least one fall and 39% reported recurrent falls within a one year period. Despite the fact that the fall in Parkinson's patients are concerning and the cost of post falls care substantial, few if any clinical guidelines have specifically addressed prevention and interventional strategies for patients with Parkinson's disease. "Silver Snowflake" Parkinson's Fall Prevention was created as an undergoing initiative to close the gap and to educate healthcare provided, patients and their families about why the patients with Parkinson's are prone to falls and provide some intervention currently available to prevent falls in patients with Parkinson's disease.

About Initiative

Mission of this initiative is to educate, globally, Every Patient and Every Provider about new research and interventions available to prevent falls in patients with Parkinson's Disease. Materials provided internationally educate patients and families about the causative factors of falls in Parkinson's patients and existing modalities that can be utilized to minimize the risk of falling. Comprehensive review of currently acceptable measures of the impaired balance concept in patients with PD is presented in the form of **Table 1**. Creators of this program strive to make the educational materials free and available in other languages to raise global awareness. The proposed implementation outline:

- 2015
  1. January 2015, Free Brochure will be available in English!
  2. February 2015, Free Poster will be available in English!
  3. July 2015, Free video will be available in English.
- 2016
  1. Materials will be translated into Polish.
- 2016–2017
  1. Translation of the materials into other languages will continue.

All educational materials will be provided free of charge, as we want to make this education available internationally. The free materials will include the seminar, poster and brochures, as well as the web site link that will have all the materials easily accessible and available in a variety of languages.

Facts about PD

Allen, Schwarzel, & Canning in 2013 [2] state of the science paper indicated that 60.5% of Parkinson's patients reported at least one fall and 39% reported recurrent falls within a one year period. Parkinson's Disease Foundation estimates that one million people in the US and seven to ten million worldwide live with PD. Currently research proves that each PD patient will experience symptoms differently. We also know that PD is a chronic and progressive movement disorder. The cause of PD is unknown and there is no cure. Treatment options are designed to manage the symptoms. Treatment options include: medication, surgery, physical activity, exercise, adaptive equipment [1].

Parkinson's Disease Foundation [1] describes pathophysiology of PD as a malfunction and death of brain nerve cells called neurons in an area of the brain called the substantia nigra. The substantia nigra is one of the movement control centers located in the brain just above the spinal cord. Dying neurons in the brain are used to distribute dopamine. Dopamine is a chemical helping with the communication of the brain that controls movement and coordination. As PD progresses dopamine production may get reduced to as low as 20% and disable the PD patient to control movement normally. Two categories of symptoms are currently identified as primary and secondary. Primary motor signs of PD include tremor of the hands, arms, legs, jaw and face; slowness of movement or bradykinesia; rigidity or stiffness of the limbs and trunk; postural instability or impaired balance and coordination. Secondary non-motor signs of PD include the loss of the sense of smell; constipation; REM behavior disorders (a sleep disorder); mood disorders; orthostatic hypotension (low blood pressure when standing up).

PD and Falls

Falls are a major source of morbidity and disability in Parkinson's disease (PD). The risk of falls is increased in patients with PD [3]. Contreras & Grandas [4] study discovered that the risk of falls increased exponentially with age, especially from 70 years forward. Patients aged >70 years at the onset of Parkinson's disease experienced falls significantly earlier than younger patients. Amar, Stack, Fitton, Ashburn, & Roberts [5] study with the participant median age of 76 years, diagnosed with PD within 6 years, discovered that of 40 participants without cognitive impairment, 40% recalled falls and 55% fell during follow-up and that in 36 participants with mild cognitive impairment, 42% recalled falls and 42% fell during follow-up. In patients with PD stability and mobility are compromised due to disease symptoms such as: stiffness (rigidity) and slow movement (bradykinesia), postural changes (freezing gait and the stooped posture); impaired postural reflexes (postural instability or impaired balance and coordination); weight distribution problem while walking (centers of mass—CoM due to the stooped posture) [6]. The above symptoms disrupt the flow of the five factors of dynatomy that help patients maintain their stability and mobility

principals and cause them to be prone to falls. **Figure 1** illustrates the concepts of five factors of dynatomy and how they correlate with symptoms of PD.

Most PD patients fall because of the above mentioned disease symptoms, but other risk factors include: history of prior falls, the patient is at risk for falling again; recent surgery, some medications. A person's home that is not adapted for PD needs: insufficient lighting in the house; lack of grab bars and the nonskid tape in the tub or shower; clutter; small animals running around the house. Ongoing assessment of PD patient impaired balance is imperative. Currently available and tested by research tools to asses PD patient impaired balance include Berg Balance Scale (BBS), Timed "Up & Go" Test (TUG) and Tinetti Balance Test (TBT). The matrix for Reviewing Measures for Concept of Impaired Balance is included in **Table 1**.

Conclusion

The first step is to educate yourself on what causes PD patients to be more prone to falls. The second step is to talk to your patients about exercises that can increase their stability and mobility. The third step emphasizes the need for exercising regularly, as research proves that several different exercise systems can help prevent falls. We encourage the patient to utilize the "Silver Snowflake" Parkinson's Fall Prevention Initiative as falls can be prevented.

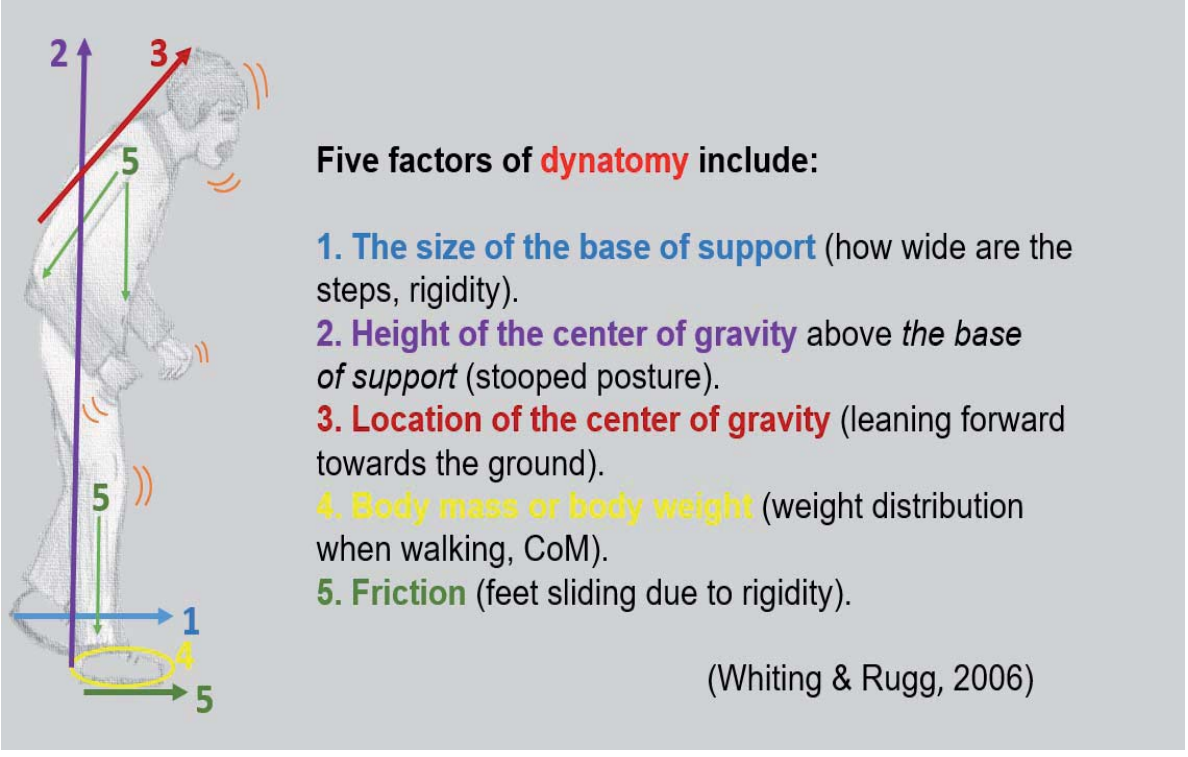

Figure 1. Concepts of five factors of dynatomy in correlation with symptoms of PD

Source: author's own analysis

Table 1. Matrix for Reviewing Measures for Concept of Impaired Balance

	OVERVIEW OF MEASURE	Measure 1	Measure 2	Measure 3
1	Name of measure or instrument	Berg Balance Scale (BBS)	Timed "Up & Go" Test (TUG)	Tinetti Balance Test (TBT)
2	This measure's definition of your concept of interest	This scale is used to objectively determine a person's capability to safely balance during a series of programmed tasks. The test time interval is 20 minutes. This 14-item scale is designed to measure static and dynamic balance of the older adult in a clinical setting.	This is a timed walking test designed to measure gait performance that correlates to balance and fall risk. This was developed as a clinical measure of balance in elderly individuals. This is a timed 3 meter walk. The time starts when the persons stands up from the chair and ends when the person returns to the chair in a sitting position.	The Tinetti Balance Test is used to objectively measure person's balance. During the 10-15 minute timeframe the patient preforms 8 programmed tasks. The test is scored on the patient's ability to perform specific tasks.
3	Original publication (reference)	Berg, K., Wood-Dauphine, S., Williams, J. I., & Gayton, D. (1989). Measuring balance in the elderly: preliminary development of an instrument. *Physiotherapy Canada*, *41*(6), 304-311.	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), 142-148.	Tinetti, M. (1986). Performance-oriented assessment of mobility problems in elderly patients. *Journal Of The American Geriatrics Society, 34*(2), 119-126 8p.
4	Any additional key studies that contributed a lot to the measure's development (reference)	1. Berg, K. O., Wood-Dauphinee, S. L., Williams, J. I., & Maki, B. (1991). Measuring balance in the elderly: validation of an instrument. *Canadian journal of public health= Revue canadienne de sante publique*, *83*, S7-11. 2. Leddy, A., Crowner, B., & Earhart, G. (2011). Functional gait assessment and balance evaluation system test: reliability, validity, sensitivity, and specificity for identifying individuals with parkinson disease who fall. *Physical Therapy, 91*(1), 102-113 12p. doi:10.2522/ptj.20100113 3. Steffen, T., & Seney, M. (2008). Test-retest reliability and minimal detectable change on balance and ambulation tests, the 36-Item Short-Form Health Survey, and the Unified Parkinson Disease Rating Scale in people with parkinsonism [corrected] [published erratum appears in PHYS THER. *Physical Therapy, 88*(6), 733-746 14p. doi:10.2522/ptj.20070214 4. Downs, S., Marquez, J., & Chiarelli, P. (2014). Normative scores on the Berg Balance Scale decline after age 70 years in healthy community-dwelling people: a systematic review. *Journal of physiotherapy*, *60*(2), 85-89. 5. King L, Priest K, Salarian A, Pierce D, Horak F. Comparing the Mini-BESTest with the Berg Balance Scale to Evaluate Balance Disorders in Parkinson's Disease. *Parkinson's Disease (20420080)* [serial online]. January 2012;:1-7 7p. Available from: CINAHL Plus with Full Text, Ipswich, MA. Accessed December 10, 2015.	1. Dal Bello-Haas, V., Klassen, L., Sheppard, M. S., & Metcalfe, A. (2015). Psychometric properties of activity, self-efficacy, and quality-of-life measures in individuals with Parkinson disease. Physiotherapy Canada. 2. Mathias S, Nayak USL, Isaacs B. Balance in the elderly patient: The „Get-up and Go" test. Arch Phys Med Rehabil 1986; 67:387-89. - See more at: http://www.rheumatology.org/I-Am-A/Rheumatologist/Research/Clinician-Researchers/Timed-Up-Go-TUG#sthash.bkcheame.dpuf 3. Medley A, Thompson M. The effect of assistive devices on the performance of community dwelling elderly on the timed up and go test. Issues Aging 1997; 20:3-7. - See more at: http://www.rheumatology.org/I-Am-A/Rheumatologist/Research/Clinician-Researchers/Timed-Up-Go-TUG#sthash.bkcheame.dpuf 4. Huang, S. L., Hsieh, C. L., Wu, R. M., Tai, C. H., Lin, C. H., & Lu, W. S. (2011). Minimal detectable change of the Timed "Up & Go" Test and the Dynamic Gait Index in people with Parkinson disease. Physical Therapy, 91(1), 114-121. 5. Bennie, S., Bruner, K., Dizon, A., Fritz, H., Goodman, B., & Peterson, S. (2003). Measurements of balance: Comparison of the timed" Up and Go" test and functional reach test with the berg balance scale. Journal of Physical Therapy Science, 15(2), 93-97.	1. Köpke, S. (2006). The Tinetti test. *Zeitschrift für Gerontologie und Geriatrie*,*39*(4), 288-291 2. Panella, L., Tinelli, C., Buizza, A., Lombardi, R., & Gandolfi, R. (2008). Towards objective evaluation of balance in the elderly: validity and reliability of a measurement instrument applied to the Tinetti test. *International Journal of Rehabilitation Research*, *31*(1), 65-72. 3. Cipriany-Dacko, L. M., Innerst, D., Johannsen, J., & Rude, V. (1997). Interrater reliability of the Tinetti Balance Scores in novice and experienced physical therapy clinicians. *Archives of physical medicine and rehabilitation*,*78*(10), 1160-1164. 4. Cipriany-Dacko, L. M., Innerst, D., Johannsen, J., & Rude, V. (1997). Interrater reliability of the Tinetti Balance Scores in novice and experienced physical therapy clinicians. *Archives of physical medicine and rehabilitation*,*78*(10), 1160-1164. 5. Franchignoni, F., Tesio, L., Martino, M. T., & Ricupero, C. (1998). Reliability of four simple, quantitative tests of balance and mobility in healthy elderly females. *Aging Clinical and Experimental Research*, *10*(1), 26-31.

5	Any studies using or testing this measure across diverse groups? Which diverse groups?	**Parkinson Disease patients** Leddy, A., Crowner, B., & Earhart, G. (2011). Functional gait assessment and balance evaluation system test: reliability, validity, sensitivity, and specificity for identifying individuals with parkinson disease who fall. *Physical Therapy, 91*(1), 102-113 12p. doi:10.2522/ptj.20100113 **Community-dwelling elderly** Steffen, T. M., Hacker, T. A., & Mollinger, L. (2002). Age-and gender-related test performance in community-dwelling elderly people: Six-Minute Walk Test, Berg Balance Scale, Timed Up & Go Test, and gait speeds. *Physical therapy*,*82*(2), 128-137. **Elderly in residential care facilities** Conradsson, M., Lundin-Olsson, L., Lindelöf, N., Littbrand, H., Malmqvist, L., Gustafson, Y., & Rosendahl, E. (2007). Berg balance scale: intrarater test-retest reliability among older people dependent in activities of daily living and living in residential care facilities. *Physical Therapy*, *87*(9), 1155-1163. **Stroke patients** Hiengkaew, V., Jitaree, K., & Chaiyawat, P. (2012). Minimal Detectable Changes of the Berg Balance Scale, Fugl-Meyer Assessment Scale, Timed "Up & Go" Test, Gait Speeds, and 2-Minute Walk Test in Individuals With Chronic Stroke With Different Degrees of Ankle Plantarflexor Tone. *Archives Of Physical Medicine & Rehabilitation, 93*(7), 1201-1208 8p. doi:10.1016/j.apmr.2012.01.014	**Parkinson Disease patients** Balash, Y., Peretz, C., Leibovich, G., Herman, T., Hausdorff, J. M., & Giladi, N. (2005). Falls in outpatients with Parkinson's disease. *Journal of neurology*, *252*(11), 1310-1315. Schenkman, M., Ellis, T., Christiansen, C., Barón, A. E., Tickle-Degnen, L., Hall, D. A., & Wagenaar, R. (2011). Profile of functional limitations and task performance among people with early-and middle-stage Parkinson disease. *Physical therapy*, *91*(9), 1339-1354. **Community-dwelling elderly** Bischoff HA, Stahelin HB, et al. (2003). Identifying a cut-off point for normal mobility: A comparison study of the timed "up and go" test in community-dwelling and institutionalized elderly women. *Age and Ageing 32*(3):315-20. **Children without physical disabilities ages 3 to 9 years old** Williams, E., Carroll, S., Reddihough, D., Phillips, B., & Galea, M. (2005). Investigation of the timed 'Up & Go' test in children. *Developmental Medicine & Child Neurology, 47*(8), 518-524 7p. **Patients after hip surgery** Kristensen MT, Foss NB, Kehlet H. Timed "Up and Go" Test as a predictor of falls within 6 months after hip fracture surgery. Phys Ther. 2007.87(1):24-30. **Community-dwelling and institutionalized elderly women** Bischoff HA, Stahelin HB, et al. Identifying a cut-off point for normal mobility: A comparison study of the timed "up and go" test in community-dwelling and institutionalized elderly women. Age and Ageing. 2003;32:315-320	**Parkinson Disease patients** Kegelmeyer, D., Kloos, A., Thomas, K., & Kostyk, S. (2007). Reliability and validity of the Tinetti Mobility Test for individuals with Parkinson disease. *Physical Therapy, 87*(10), 1369-1378 10p. doi:10.2522/ptj.20070007 **Multiple Sclerosis patients** Tesio, L., Perucca, L., Franchignoni, F. P., & Battaglia, M. A. (1997). A short measure of balance in multiple sclerosis: validation through Rasch analysis. *Functional neurology*, *12*(5), 255-268. **Amyotrophic Lateral Sclerosis patients** Kloos, A. D., Dal Bello-Haas, V., Thome, R., Cassidy, J., Lewis, L., Cusma, T., & Mitsumoto, H. (2004). Interrater and intrarater reliability of the Tinetti Balance Test for individuals with amyotrophic lateral sclerosis. *Journal of Neurologic Physical Therapy*, *28*(1), 12-19. **Community-dwelling elderly** Raîche, M., Hébert, R., Prince, F., & Corriveau, H. (2000). Screening older adults at risk of falling with the Tinetti balance scale. *The Lancet*, *356*(9234), 1001-1002.

	DESCRIPTION OF MEASURE	Measure 1	Measure 2	Measure 3
6	Structure of measure • List all domains if there are any • How many scales or scores are there of your concept? • If there are sub-scales, is there also a summary score?	Domain: • Balance Scores/Scores: • 14 programmed tasks scored on the five point ordinal scale with a range of 0 to 4. No Subscales Summary Score: 41-56 = low fall risk 21-40 = medium fall risk 0 –20 = high fall risk	Domain: • Functional mobility Scores/Scores: • Time No Subscales Summary Score: ⩽14 seconds indicates high fall risk	Domain: • Balance 9 tasks and Gait 7 tasks Scores/Scores: • Programmed tasks scored on three point ordinal scale with a range of 0 to 2. Maximum points 28. No Subscales Summary Scores: ⩽18 indicates high fall risk 19-23 indicates moderate fall risk ⩾24 indicates low fall risk
7	Number of items: • For each domain that is scored separately • Total across domains	N/A	N/A	Yes Balance 9 tasks Gait 7 tasks
8	Specific response choices of items • Number of choices • Labels for choices if any	Each test performed is rated on a 0-4 scale. After the tests are completed, the scores are added up to achieve a total score which provides the relative fall risk for the client.	No specific response – this is a timed test on how well a patient gets up from the chair, walks a small distance and sits back down. That time is what determines the fall risk in the patient.	A score of 0 represents the most impairment, while a 2 would represent independence of the patient. Added scores form a balance assessment score.
9	Time frame allocated to complete the measure	20 minutes	The cut-off time to complete TUG - 13.5 seconds	10 to 15 minutes

10	Method of administration: • Self- or interviewer- administered • If the interviewer - by telephone or in person.	Interviewer administered – in person task performance exam.	Interviewer administered – in person task performance exam.	Interviewer administered - in person task performance exam.
	NATURE OF THE SAMPLES ON WHICH IT HAS BEEN TESTED	Measure 1	Measure 2	Measure 3
11	Source and type of subjects (e.g., inpatients, outpatients, community dwelling, students, church members, list of HMO members, etc.)	Elderly in numerous settings – science center for elderly, Inpatient acute care hospitals, and elderly home. Berg, K. O., Maki, B. E., Williams, J. I., Holliday, P. J., & Wood-Dauphinee, S. L. (1992). Clinical and laboratory measures of postural balance in an elderly population. *Archives of physical medicine and rehabilitation*, *73*(11), 1073-1080.	Elderly in numerous settings including within the community, acute care settings and rehabilitation settings. Whitney, J. C., Lord, S. R., & Close, J. C. (2005). Streamlining assessment and intervention in a falls clinic using the Timed Up and Go Test and Physiological Profile Assessments. *Age and ageing*, *34*(6), 567-571. Nocera, J. R., Stegemöller, E. L., Malaty, I. A., Okun, M. S., Marsiske, M., Hass, C. J., & National Parkinson Foundation Quality Improvement Initiative Investigators. (2013). Using the timed up & go test in a clinical setting to predict falling in Parkinson's disease. *Archives of physical medicine and rehabilitation*, *94*(7), 1300-1305.	Elderly patients diagnosed with Parkinson's Disease Kegelmeyer, D. A., Kloos, A. D., Thomas, K. M., & Kostyk, S. K. (2007). Reliability and validity of the Tinetti Mobility Test for individuals with Parkinson disease. *Physical Therapy*, *87*(10), 1369-1378.
12	Sample size	70	60 in original study.	149
13	Sample characteristics: • Age range and mean • % female/male • Race/ethnicity or % minority SES indicators (education, income)	1. 79.36 SD 6.73 2. 69.64 M/27.192 F 3. Avg Edu: 10.66 yrs, 28.13 married, 32.97 living at home	1. 64.6 SD 8 2. No breakdown 3. No data available.	1. 68.8 SD 11.04 2. No breakdown 3. No data available
14	Has the measure been used or tested in the diverse group you are interested in? Provide reference.	Yes Qutubuddin, A. A., Pegg, P. O., Cifu, D. X., Brown, R., McNamee, S., & Carne, W. (2005). Validating the Berg Balance Scale for patients with Parkinson's disease: a key to rehabilitation evaluation. *Archives of physical medicine and rehabilitation*, *86*(4), 789-792.	Yes Huang, S. L., Hsieh, C. L., Wu, R. M., Tai, C. H., Lin, C. H., & Lu, W. S. (2011). Minimal detectable change of the Timed "Up & Go" Test and the Dynamic Gait Index in people with Parkinson disease. *Physical Therapy*, *91*(1), 114-121.	Yes Kegelmeyer, D. A., Kloos, A. D., Thomas, K. M., & Kostyk, S. K. (2007). Reliability and validity of the Tinetti Mobility Test for individuals with Parkinson disease. *Physical Therapy*, *87*(10), 1369-1378.
15	Has it been used or tested in a group similar to the diverse group you are interested in? State group and provide reference	Yes in Multiple Sclerosis: Fjeldstad, C., Pardo, G., Frederiksen, C., Bemben, D., & Bemben, M. (2009). Assessment of postural balance in multiple sclerosis. *International Journal Of MS Care, 11*(1), 1-5 5p.	Yes in Multiple Sclerosis: Forsberg, A., Andreasson, M., & Nilsagård, Y. E. (2013). Validity of the Dynamic Gait Index in People With Multiple Sclerosis. *Physical Therapy, 93*(10), 1369-1376 8p. doi:10.2522/ptj.20120284	Yes in Amyotrophic Lateral Sclerosis Kloos, A. D., Dal Bello-Haas, V., Thome, R., Cassidy, J., Lewis, L., Cusma, T., & Mitsumoto, H. (2004). Interrater and intrarater reliability of the Tinetti Balance Test for individuals with amyotrophic lateral sclerosis. *Journal of Neurologic Physical Therapy*, *28*(1), 12-19.
16	Is the sample in the original publication very different from the one you are interested in? How?	Yes – The original publication tested general elderly versus elderly specifically with Parkinson's Disease.	Yes – The original publication tested elderly without Parkinson's Disease.	Original publication was a conceptual paper.
	VARIABILITY	Measure 1	Measure 2	Measure 3
17	Possible score range	0-56	6.5-20.3	0-24
18	Observed score range	43-49	14.8(3.7)	12–28
19	Mean (SD)	46	10.6	23.25±3.75
20	Ceiling or floor effects (% highest or % lowest score)	10% lowest, 35% highest	None	Floor effect exists for those in later Hoehn & Yahr stages (eg, stages 4 and 5)
21	Skewness statistic	P = 0.035 – significantly skewed to the left.	None Evident	None Evident

	RELIABILITY	Measure 1	Measure 2	Measure 3
22	Types of reliability reported and coefficients: Internal consistency (Cronbach's alpha), Test-retest (Pearson correlation, Spearman correlation)	Internal Consistency: Cronbach's Alpha: 0.96	Excellent Inter-rater reliability – 0.98-0.99 Correlation coefficients ranged from 0.71-0.99	Excellent interrater reliability 5 raters (ICC = 0.87; 95% CI = 0.8-0.93) Excellent interrater reliability with experienced raters (n = 2; ICC = 0.84; 95% CI = 0.69-0.92) Excellent interrater reliability with student raters (n = 3; ICC = 0.89; 95% CI = 0.8-0.94)
	INTERPRETABILITY	Measure 1	Measure 2	Measure 3
23	Direction of a high score (what does the high score mean?)	The lower score indicates a higher risk for falling.	The high score indicates a higher risk for falling.	The lower score indicates a higher risk for falling.
	VALIDITY			
	Content Validity	Measure 1	Measure 2	Measure 3
24	Evidence of content validity in the original publication? Describe	Not evident.	Not evident	Not evident
25	Evidence of content validity in one of the other publications? Describe	Parkinson's Disease: Excellent correlations with the Timed Up and Go (TUG) (r-0.78) (Brusse et al., 2005)	Nothing directly noted	Parkinson's Disease: Adequate correlations with the Comfortable gait speed (r= 0.52) (Kegelmeyer et al, 2007)
	Criterion Validity (gold standard to compare to)	Measure 1	Measure 2	Measure 3
26	Evidence of criterion validity in the original publication? Describe	The authors suggest the presence of criterion validity, however, also mention about that there is no 'gold' standard to compare these results to.	None Evident in the original publication.	The authors mention about no 'gold' standard, however, did compare it to the Berg Balance Scale for validity measurement.
27	Evidence of criterion validity in one of the other publications? Describe	Brusse, et al (2005) compares this exam to multiple other balance 'type' of tests and it scored >0.50 with a p>0.05 significance level. Brusse, Kevin J, Zimdars, Sandy, Zalewski, K.R., & Steffen, T.M. (2005). Testing functional performance in people with Parkinson disease. *Physical therapy, 85*(2), 134-141	Bennie, et al (2003) compares the TUG to the BBS and found significant correlation between the two, r = -0.47p = 0.044 Bennie, S., Bruner, K., Dizon, A., Fritz, H., Goodman, B., & Peterson, S. (2003). Measurements of balance: Comparison of the timed" Up and Go" test and functional reach test with the berg balance scale. *Journal of Physical Therapy Science*, *15*(2), 93-97.	Found correlation between the Tinetti and the UPDRS – r = -0.40 p < 0.05 and comfortable gait speed r = 0.52 p <0.01. Kegelmeyer, D. A., Kloos, A. D., Thomas, K. M., & Kostyk, S. K. (2007). Reliability and validity of the Tinetti Mobility Test for individuals with Parkinson disease. *Physical Therapy*, *87*(10), 1369-1378.
	Construct Validity Known groups, convergent, convergent/ discriminant, factorial	Measure 1	Measure 2	Measure 3
28	Evidence of any type of construct validity in the original publication? Describe	There were mixed results of convergent/divergent validity of with ranges of 0.47-0.67.	None Evident	None Evident
29	Evidence of any type of construct validity in one of the other publications? Describe	Ditunno, et al (2007) found significantly similar results at 3/6/12 months ranging from 0.78-0.92. Ditunno, J. F., Barbeau, H., Dobkin, B. H., Elashoff, R., Harkema, S., Marino, R. J., ... & Deforge, D. (2007). Validity of the walking scale for the spinal cord injury and other domains of function in a multicenter clinical trial. *Neurorehabilitation and neural repair, 21*(6), 539-550.	Convergent Validity when measured against BBS, FGS, CGS: 0.78/0.69/0.67 Brusse, K. J., Zimdars, S., Zalewski, K. R., & Steffen, T. M. (2005). Testing functional performance in people with Parkinson disease.*Physical therapy*, *85*(2), 134-141.	None Evident
	RESPONSIVENESS, SENSITIVITY TO CHANGE	Measure 1	Measure 2	Measure 3
30	Evidence of responsiveness or sensitivity to change in the original publication? Describe	There was no evidence of responsiveness in the original publication.	No evidence of responsiveness	No evidence of responsiveness

31	Evidence of responsiveness or sensitivity to change in one of the other publications? Describe	No other publications surrounding Parkinson's Disease located as being published. Responsiveness/Sensitivity were found with other disease processes such as stroke and vestibular diseases.	No evidence of responsiveness geared towards Parkinson's disease specifically. Only responsiveness geared towards community dwelling older adults and osteoarthiritis.	Sensitivity = 76% Specificity = 66% Kegelmeyer, D. A., Kloos, A. D., Thomas, K. M., & Kostyk, S. K. (2007). Reliability and validity of the Tinetti Mobility Test for individuals with Parkinson's disease. *Physical Therapy*, *87*(10), 1369-1378.
	TRANSLATIONS	Measure 1	Measure 2	Measure 3
	Is the measure available in the language(s) you are interested in?	Yes - Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Społecznego *(2015).* Skala Równowagi Berga. Retreved from: http://www.ump.gwsh.eu/pliki/fizjoterapia/metody_biomechaniczne/7%20-%20Skala%20Rownowagi%20Berga.pdf	None found.	Yes. Bosacka M, Bączyk G (2014) The role of clinimetrics in nurse's work with a patient after stroke. *Pielgniarstwo Polskie, 3*(53):244–249.
	What is the quality of the translation (adequacy of methods of translation)?	Unable to determine.	Unable to determine.	Only abstract was translated to Polish. Authors of the articles are of Polish decent.
	PRACTICALITY	Measure 1	Measure 2	Measure 3
32	Any statistics on reading level?	Yes	Yes	Yes
	ACCEPTABILITY FOR YOUR POPULATION	Measure 1	Measure 2	Measure 3
33	Perceived burden if noted, your estimate of perceived burden for your population	Perceived burden is the interview questions and testing that occurs during this examination.	Perceived burden is the testing that occurs during this examination	Perceived burden is the testing that occurs during this examination
34	"Real" burden – length of time needed, convenience of method of data collection	Real burden includes a time range of 6-30 minutes in one sitting with a mixture of interview questions and various timed movements to help determine the balance status. Collection of data includes written.	Real burden includes a time range of 0+ seconds to the amount of time it takes for the client to complete the examination. Collection of data includes the timing of the completion of exercises.	Real burden including the two different sets of exercises with one set testing balance and one set testing gait. Collection of data includes the measurement of the individual exercises and assigning a number of 0 to 2 determining the effectiveness of the person completing the exercise. The timing range for completion 10-15 minutes.
	SCORING MANUAL, SCORING RULES	Measure 1	Measure 2	Measure 3
35	Is there a manual or guide on how to create scores from the questionnaires?	Yes there is a guide within the exam itself on how to score the participants on a scale of 1-4. Once all of the scores are collected, they are added to create the final score. The final score then is compared to the ranges to provide the risk of falls for the tested population.	Yes there is a guide on the procedures that need to be completed and when to time it.	Yes a guide is evident within the assessment on what exercises need to be completed and how.

Source: author's own analysis

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