

Queensland
Ballet

DANCE FOR PARKINSON'S PILOT RESEARCH



2014 /

SHORT
REPORT



INTRODUCTION

In 2013, Queensland Ballet (QB) launched a pilot program offering specialised dance classes to people with Parkinson's Disease (PD), based on the internationally recognised Dance for PD® program. The pilot program was held at the Queensland Ballet Studios at the Thomas Dixon Centre, Brisbane, Australia between October 2013 and July 2014, with support from the John T. Reid Charitable Trust. Thirty ability-appropriate dance classes introduced participants to five ballets within the QB repertory: *The Nutcracker*, *Coppélia*, *Romeo and Juliet*, *Serenade* originally developed by Mark Morris Dance Group and Brooklyn Parkinson Group and *Bolero*, through the use of music and choreographic material within the weekly class content. Accompanied by live piano, the dance sessions also included structured exercises and creative moment activities. Each class ran for 75 minutes and was followed by an afternoon tea session. To supplement the studio activities and engage constituents across multiple levels, participants attended live theatre performances of *The Nutcracker* and *Romeo and Juliet*, and were invited to watch QB company class, in addition to attending other company educational events. As part of the pilot program, QB partnered with the Queensland University of Technology – Creative Industries (Dance) and Health (Movement Neuroscience), and the University of Queensland – Health and Behavioural Sciences (Physiotherapy) faculties to conduct initial research into the effects of these dance classes.

The research used a mixed-methods approach and collected qualitative and quantitative data from the program using interviews, common clinical assessment tools of walking, balance, hand function, quality of life, and laboratory assessments of postural sway and gait. Tools included the Fullerton Advanced Balance (FAB) scale, the Mini BESTest, Activities specific balance confidence (ABC) scale, force plates, a GAITrite mat, Nine-hole peg test (9HPT), Timed Up and Go test (TUG) and the standard PDQ 39 questionnaire. Additional feedback and quality of life questionnaires were distributed and collected by QB as well as film footage and observations recorded during the dance classes. This report provides initial documentation and analysis of the findings. These findings support and expand the Research presented in the University of Roehampton and English National Ballet's (ENB) Dance for Parkinson's program report (Houston & McGill, 2011) based on the pilot research study of their 12 class program conducted between October 2010 and February 2011.

This research study is based on the observation of data collection from 11 volunteer research participants from before, during and after the pilot program. The participants ranged from 38 – 80 years of age (M = 56.8, SD = 12.0) and included seven women and 4 men who had been diagnosed with Parkinson's disease between one and eight years prior to their baseline assessment for this research study. The majority (82%) of participants were diagnosed with idiopathic Parkinson's disease and reported experiencing mild symptoms, with little impact on their postural stability (see Hoehn and Yahr Stage 2). While some were still very active and mobile, others were observed to use a combination of walking aids including walking sticks and walking frames. Adherence to the pilot program was high, with research participants attending an average of 82.7% of the 30 scheduled classes.

DURING THE QB DANCE FOR PARKINSON'S PILOT PROGRAM MORE THAN 80 PARTICIPANTS ATTENDED CLASSES ON A REGULAR BASIS FOR 75 MINUTES EITHER WEEKLY OR FORTNIGHTLY OVER THE 30 CLASS PROGRAM.

The quantitative results of the pilot program demonstrated that overall the group showed **improved ability to maintain functional mobility** whilst dual tasking. There were trends **toward improvements in gait cadence and velocity** while walking in a straight line, and improvements in gait cadence and velocity whilst dual tasking. Individual participants showed a **reduction in bodily discomfort, increased emotional well-being, increased confidence in balance activities** and an **improved ability to communicate**. The qualitative results demonstrated positive emotional, social, physical, and cognitive benefits including an **overall group increase in confidence, body awareness, social inclusion and short term mobility** which had a **positive effect on overall perception of quality of life**. The opportunities for creative expression and **the artistic connections to a professional ballet company**, including the experience of live music during classes, **were highly valued**. Furthermore, the dance class brought new people to dance and then acted as a **gateway activity to participation in additional exercise, social activities and other new dance experiences**.

Beyond the benefits of the class itself, the dance program reached people living with Parkinson's who might not normally be involved in Parkinson's community activities, for example those who are relatively early in their journey with Parkinson's. Although already active, these participants' shared that their initial involvement in the dance program was aimed at minimising the impact of PD, trying something new and that they had not felt ready or interested in attending more traditional Parkinson's targeted programs.



As the first study of its kind in Australia, the research results of this initial pilot program confirmed and supported much of what was reported in the ENB and Roehampton University study (Houston & McGill, 2011), as well as other previous research on Dance for PD® based programs (Earhart, 2009; Heiberger et al., 2011; Westheimer, 2011). While many of the qualitative results of the QB pilot program are very similar to the reported outcomes in the ENB-Roehampton report, the results have been written up using the language and descriptions that fit most closely with this particular group of participants in the Australian environment. Whilst Australia holds many cultural similarities to both the United States, where the Dance for PD® program was developed, and the United Kingdom where the ENB program was developed, there are also many differences. As the first professional dance company to pilot Dance for Parkinson's classes in Australia, it was an important opportunity to evaluate both the effect of Dance for Parkinson's classes, and the QB pilot program.

This short report is intended as a summary of results, and highlights one case study to demonstrate the interrelationship between the quantitative and qualitative results. Participant quotes have been included throughout as recorded within the research study although all comments are anonymous to maintain privacy. More extensive research findings, additional case studies, participant quotes and figures are included in the complete QB Project Report.

WITH A MIXED GROUP OF PARTICIPANTS THE IMPACTS ARE DIFFERENT AND OVERALL NON-LINEAR AS A GROUP, YET WITHIN THE CONTEXT OF THE QB PILOT PROGRAM, THE RESEARCH DEMONSTRATED THAT DANCING:

Provides emotional, physical and social benefits for people living with Parkinson's.

Can improve ability to maintain functional mobility whilst dual tasking.

Can provide some improvements in cadence of gait and velocity in walking alone and whilst dual tasking.

Can help with short term mobility.

Provides strategies and experience to increase mind-body awareness.

Can develop confidence to use new movement and mobility strategies.

Provides movement strategies to aid activities of daily living.

Creates opportunities to explore different movement energies and patterns.

Encourages and provides a means for positive social interaction and inclusion.

Encourages feelings of emotional and physical well-being, dignity, confidence and community connections.

Provides opportunities to nurture and develop imagination and creativity through movement and artistic expression.

Provides a social event that is about fun, artistic expression, and possibility rather than about the limitations of Parkinson's Disease.

Provides an introduction to dance and opportunity to learn about ballet and the behind the scenes workings of a professional ballet company from the inside out .

Develops and sustains community and a positive means of group exercise.

Acts as a 'gateway activity' to further physical, social and arts activities.

Provides positive enrichment and a future career development option for professional dancers as teaching artists.

Further, observations during the dance classes showed increased stability, posture and greater reach in both physical movement, as well as an engaged focus and animated facial expressions.

The dance classes were observed to build a sense of community in the interaction with QB as well as building a community that was enjoyable for both the participants as well as their partners and caregivers.

OVERALL RESULTS

You go for the week and you feel very uplifted and because you've been moving you feel looser, you feel energised, and it does translate into the week, you feel, you've got that positivity there, that I can do this.

The experience of dancing from the participants' perspectives had positive emotional, social, physical, and cognitive benefits. Through interviews, unstructured conversations and observations, they shared that the dance classes provided a new and welcome activity. For all of the participants, the dance classes were reported to have improved their mood and they described the dance classes as: adventurous, challenging, community, confidence-building, connection, enjoyable, exhilarating, expressive, flexible, friendly, fun, good fitness, groundbreaking, happy, inclusive, inspiring, interesting, invigorating, liberating, lighthearted, rewarding, socially good, and spiritual.

Given the diverse range of participants and their experience of living with Parkinson's, their responses ranged in emphasis where some focused more on physical effects, while others reported increased emotional or social benefits. Each participant shared an individual story both with what it was like to live with Parkinson's, as well as how he or she experienced the dance classes. Participants described the combination of physical activity within an artistic approach as being beneficial, both emotionally and physically, in that they felt more fluid, mobile, and that they achieved more than they expected over the course of the dance classes.

...and so it sort of shows you as well that, gee, yeah, I can still do all these things and there's still sort of many years ahead, life is not over just because I've got this diagnosis, there's a lot of things I can do, and this is what the dance class has shown too, it's different, it's not just sort of going to exercise class, I'm going to yoga or Pilates, this is different, it's fun, it's lively, it's interactive, it's you know, yeah, we have lots of fun.

Additionally, the artistic and social elements were reported to be important components of making the fitness aspects of dance enjoyable. Some participants were very articulate in describing the benefits that they had noticed, such as feeling happier and more optimistic, increased mind-body awareness or identifying as a dancer rather than as a person with Parkinson's. Participants in the QB pilot program shared how the aesthetic focus and approach of the dance class enabled them to replace their "Parkies" image with a new understanding of themselves as dancers.

OVERALL RESULTS

Participants described how the people around them such as partners, family members or medical professionals had remarked on changes they had seen since starting the Dance for Parkinson's classes. Although individual in their experiences, all participants described the emotional, physical, social, and cognitive benefits of the class. Throughout the interviews and conversations several overarching categories emerged.

Categories described by the participants included

EMOTIONAL

Happier, more positive outlook, future building, optimism, sense of dignity, confidence, motivation, empowerment

PHYSICAL

Fluency of movement and mobility, coordination, aid to daily life

COGNITIVE

Mind-body awareness

SOCIAL

New relationships, deepening of existing relationships, community connections, dancing as a group

ARTISTIC

Connection to QB, learning about ballet, connections of class to stage, live music, shift from identifying as people with Parkinson's or patients to identifying as dancers, creativity, expression

GATEWAY ACTIVITY

Participation in further physical, social, and artistic activities

OVERALL RESULTS

Participants described feeling happier and also gaining more confidence. They attributed their improvements in confidence to increased physical awareness, as well as the social connections and relationships that were built into the dance classes. While participants described aspects of their lives as becoming more limited due to PD, such as mobility or creative expression, the dance classes were seen as offering new possibilities regarding their quality of life.

I mean, it gives you a vehicle for creative expression, you know, some avenues have been cut back, and it gives an outlet for those sort of things. I think, like it gives a sense of movement and gesture is very precious and beautiful, and very streamlined, it's heightened my aesthetic awareness of that.

There appeared to be a strong connection between the confidence felt emotionally and how participants felt their physical mobility increased. The participation in the dancing was seen by the participants to show possibilities of new ways of moving and built confidence to access further mobility than perceived possible. Participants reported becoming more optimistic and began to look forward to upcoming classes. Motivation for attending the dance classes remained high and there was ongoing interest demonstrated in learning new material or revisiting and working on previous material, or favorite class activities. Participants described talking about or demonstrating favourite dance activities to people outside of the dance classes. Choreography such as the "Waltz of the Flowers" from *The Nutcracker* was requested by participants as a group favorite, which involved a progression of swinging arms, gliding leg movements and eventually complex group interaction.

The participants shared how they felt empowered to explore their creativity, and though challenging or intimidating at first, they grew to enjoy and look forward to the creative dance exercises. In one example such as the name game (where dancers create a dance movement to go with their name) throughout the course of the program, it was observed that the variety, confidence and depth of artistic choice-making increased. Participants also commented on how they noticed the increase in confidence and creativity in other members of the class.

I just LOVED watching other people do it. And they're so creative, and after a couple of weeks, I thought, they're still there. It's kind of like the Parkinson's kind of hides them, but they're still there. And they were coming out, and that was really good, to really recognise that.

OVERALL RESULTS

Over the course of the 30 dance classes, the participants' relationships developed from casual interactions to strong ties. The participants began to self-identify as a community built from their interactions during the dance classes.

That was good, 'cause I felt that there's a really supportive community out there, especially in a different area that you didn't really expect, and met sort of different people that I wasn't used to, plus I met lots of people with Parkinson's, but we're all so different, and yet it brought us together.

One of the most challenging components of class commented on repeatedly by the participants was that some of the choreography required dual tasking or coordination of the arms and feet simultaneously, incorporating musicality and narrative. While many participants felt that these kinds of activities were difficult, they also described how they felt they were beneficial and appreciated the challenge.

I think, 'cause it was hard! You think oh yeah, just go along to dance, but the sequence, and the timing and all that type thing, it's really quite challenging and things, so I think that's, perhaps I'm feeling a bit more steady on my feet as well, or something like that, because of the doing different dance steps and everything.

Additionally, participants shared that their involvement in the dance class had been a gateway to further activities. For some this was going to see other dance performances and supporting the dance instructors as part of the dance class community. For others, they described having the confidence to pursue additional physical activities or to return to hobbies that they thought they could no longer pursue. For several participants it became the creative exploration and generation of new dance steps at home. Some participants began organizing further social activities and groups meeting regularly outside of class. Connecting to the sense of community even resulted in several informal fundraising initiatives being undertaken to subsidise the cost of other Parkinson's activities outside of the QB pilot program.





QUANTITATIVE MEASUREMENTS

A series of common clinical assessments for people with Parkinson's disease were used in this pilot study. Walking ability was assessed using the Timed Up and Go (TUG) test performed under single and dual task conditions (Shumway-Cook, 2000). Detailed spatiotemporal parameters of gait, including step length, gait speed and cadence were also recorded as participants walked 10 metres over an instrumented walkway (GAITrite mat). Balance ability was scored using the Fullerton Advanced Balance (FAB) scale, a 10-item balance assessment of common functional tasks (Klein, 2011; Rose, 2006). Postural sway in standing was measured using force plates. Balance self-efficacy, or confidence, was measured using the Activities-specific Balance Confidence (ABC) scale (Powell, 1995). Upper limb function was assessed using the Nine-hole peg test (9HPT) which has demonstrated high test-retest reliability in people with PD (Earhart, 2011).

Participant Quality of Life (QOL) was assessed using the 39-item Parkinson's disease Questionnaire (PDQ-39). Participants were also asked to complete a questionnaire about their general sense of well-being, including a questionnaire specifically about the dance classes and how they feel their participation has impacted on the QOL and general well-being.

In the summary below statistical analysis of the data has been used to demonstrate the strength of the change across the group. It is however important to note that due to the small number and large variability of participants in the reported sample the power of the study is low. As such the degree of change needs to significance levels (p values) must be interpreted with some caution.

TIMED UP AND GO

This section focuses specifically on two of the assessments of walking ability, the TUG under single and dual task conditions, and a 10m walk over the GAITrite mat. Overall, these assessments demonstrate that the group showed improvements when walking under both single and dual task conditions, as seen by walking faster (gait velocity) and with more steps (cadence) when performance before the dance program was compared to after.

When TUG performance was compared before and after participation in the dance program the group demonstrated significant improvements in the average time taken to perform the TUG under single task conditions ($p = 0.027$), and the TUG with an added language challenge ($p = 0.001$) (Figure 1). There was no significant change in time taken to perform the TUG test with an added counting challenge ($p = 0.087$).

The lack of a significant change in the TUG with counting speed was largely due to the larger variability in performance across participants ($SD = 3.3$), much greater than the other tasks ($SD 1.2$ to 1.6). This variability was greatly increased by one participant who demonstrated a significant increase in the time taken to perform the TUG with counting after the dance program compared to before, despite a substantial improvement in both the TUG and TUG with language task. When this participant was removed from the analysis of the change in TUG with counting task, there was a substantial reduction in the variability for this measure ($SD = 2.2$) and a significant improvement in the group mean difference ($p = 0.004$).

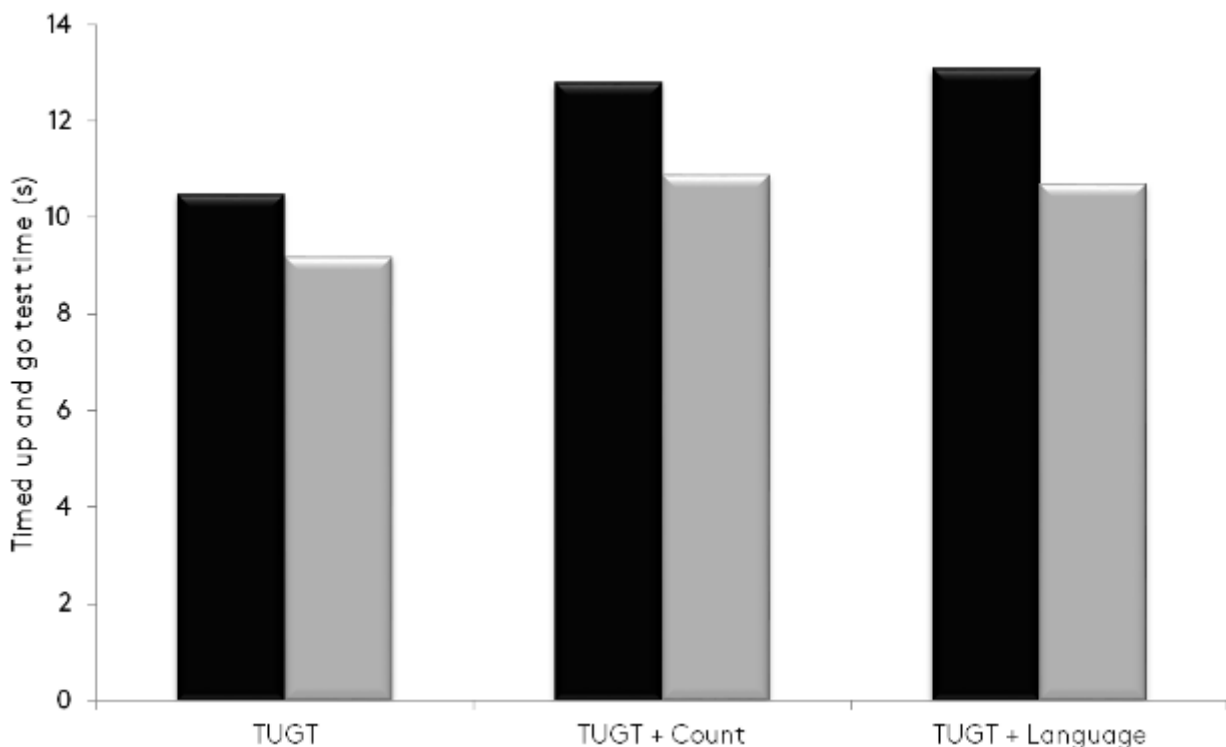


Figure 1

Average time taken to perform the Timed up and go test and the Timed up and go test with concurrent counting language tasks before (grey) and after (black) participation in the Dance for Parkinson's

GAITrite MAT

Figure 2 shows the spatiotemporal parameters of gait, including gait velocity, cadence, stride length and double support time that were assessed as participants walked 10 meters over a GAITrite mat before and after the dance program. There was a significant change in cadence ($p < 0.006$) and velocity ($p < 0.05$) for the walk + calculation task when results were compared pre and post the dance program. When walking without a second task (walk only), there was a significant improvement in gait velocity ($p = 0.041$) and trends for an improvement in stride length ($p = 0.055$) and cadence ($p = 0.058$). There was no change in double support time between pre and post assessments, and overall, there was quite a bit of variability between individuals.

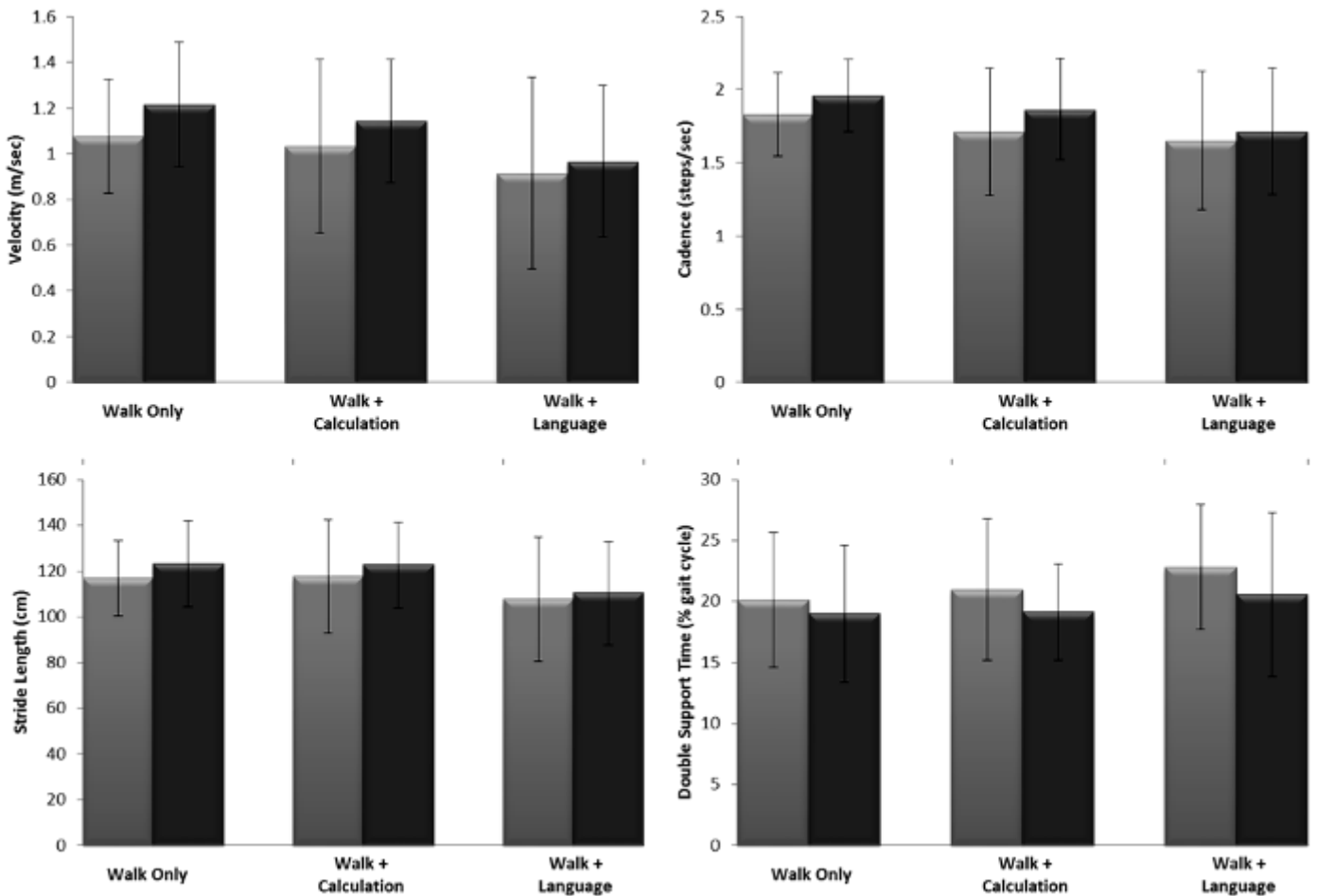


Figure 2

Average velocity, cadence, stride length and double support time for the group of research participants before (grey) and after (black) participation in the Dance for Parkinson's program. The black bar indicates the standard deviation across the group.

In order to frame the results in the context of both an arts and health experiences, a single case study has been chosen to demonstrate the interrelationship of quantitative data and qualitative results as seen through an individual's own words.

CASE STUDY — PARTICIPANT A

QUALITATIVE ASSESMENT

I felt free. I didn't feel I had anything hanging over me. Quite hard to explain it. But I did things that I normally wouldn't have done. And that's very important.

When Participant A first entered classes, he demonstrated strong facial masking, or absence of facial expression, and a subdued personality. His stride was interrupted by small steps, his posture was stooped and it was difficult to maintain eye contact. Over the course of the 30 dance classes, he was observed to become more animated in facial expression and movements, to exhibit greater eye contact and as a first time dancer he expressed how much fun he was having.

I loved it. Because it was the first time for me, to connect with it. I'm aware of the dance. And I'm aware of people doing it.

Participant A opened up physically and expressively in his body and the creative elements became a place for his personality to shine. For example, he was observed to achieve a further reach of the arms and lengthening of the spine during the initial seated warm-up dance activities. Physically, he was observed to have increased stability for the duration of the classes and greater sense of balance in the transitions between elements of class such as sitting and standing and general flow, he stated “*Oh yeah, I've become more in tune with movement. Because movement's all there is.*” There was an observed improvement in sustained focus for individual exercises as well as throughout the class. Initially, it was observed that there were some exercises that he showed difficulty completing; this was seen to improve throughout the duration of the class, even as the dance activities became more complex. He shared that he wanted to help support the class and started to put the chairs away at the end of class and when there were new male participants in class he made a point of talking to them and encouraging them to come back. He also expressed how much he enjoyed going to see the ballet performances for the first time and that he was planning on attending more dance performances. The social and relational elements of the class were stated to be highly important for Participant A. He attended class with his partner and he shared that the experience was highly valued by both of them as a time to relax, enjoy and have fun together with a community they felt a part of.

Yes. I think the thing that comes through with the whole dance thing is the enjoyment and the camaraderie that starts to develop. I looked around when we were here last Saturday, and people were smiling and laughing and chatting and you know, they'd built up relationships. And that's what it's all about. Because Parkinson's robs you of relationships.

CASE STUDY — PARTICIPANT A

QUANTITATIVE ASSESMENT

Participant A was a 70 year-old gentleman diagnosed with idiopathic PD at the age of 65 years who was able to walk independently without aids or assistance. On commencement of the Dance for Parkinson's pilot program study he reported that he had experienced 2 falls in the past 12 months, both in the backward direction. He reported little gait impairment, with just some slowing of his walking and had high balance confidence (ABC = 98.1%) with slightly reduced confidence in his ability to perform high level balance tasks such as reaching while standing on a chair, stepping off an escalator while holding packages and walking on a slippery footpath. He also reported slightly reduced confidence in his ability to get in and out of a car without falling.

Overall health-related quality of life (HRQOL) was moderately high (20/100) with baseline scores representing a person who experienced excellent feelings of social support, function in ADL and mobility and low feelings of stigma related to his PD. He did however report slightly reduced emotional wellbeing, some impact of cognitive impairment, and moderate difficulty with communication and bodily discomfort. Balance scores at baseline indicated moderately impaired balance, particularly in the areas of reactive balance (3/6), sensory organisation (4/6) and dynamic gait (8/10) resulting in a total mini BESTest score of 20/28. Higher level balance appeared particularly affected with an FAB score of 28/40. TUGT score was within the expected normal for someone of his age (8.94s). There was however a substantial dual task effect seen in the TUGT with counting and language tasks with the time taken to perform these tests increasing to 15s and 14.5s respectively.

Following participation in the Dance for Parkinson's pilot program, there was no substantial change in reported HRQOL, however on the individual subscale of bodily discomfort participant A reported a substantial (25/100) improvement (this was offset by small reductions in other subscales). There was no change in the mini BESTest scores from pre to post assessment, however there was some improvement in the FAB (28-32/40) indicating an improvement in higher level balance activities. Consistent with this, his confidence to perform the high level tasks listed above improved to 100% indicating that he was sure he could perform all of the activities without falling. Participant A also showed substantial improvement in the timed up and go, and in particular in the dual task TUG with the time taken to complete these tests reducing by 2.4s (TUGT), 6.3 (with counting) and 5.8s (with language).

The spatiotemporal parameters of gait (measured using the electronic GAITrite mat) reflected similar improvements with an increase in walking velocity, stride length and cadence (Figure 3). The proportion of the gait cycle spent in double support had also reduced substantially after the Dance for Parkinson's pilot program. The improvement in these gait parameters was particularly evident for the two dual task walking conditions (i.e. walking and counting and walking whilst performing a language task). After the program, this participant had also substantially reduced the number of steps and the time taken to execute a 180 degree turn (Pre; 7.3 steps, 3.16s and Post; 5 steps, 2.6). Combined these results demonstrate that this participant experienced a substantial improvement in both balance and gait throughout his participation in the Dance for Parkinson's program. This participant demonstrated a small improvement in the dexterity of his dominant hand with a slightly faster performance (2.5s) on the nine-hole peg test.

CASE STUDY

QUANTITATIVE ASSESMENT PARTICIPANT A

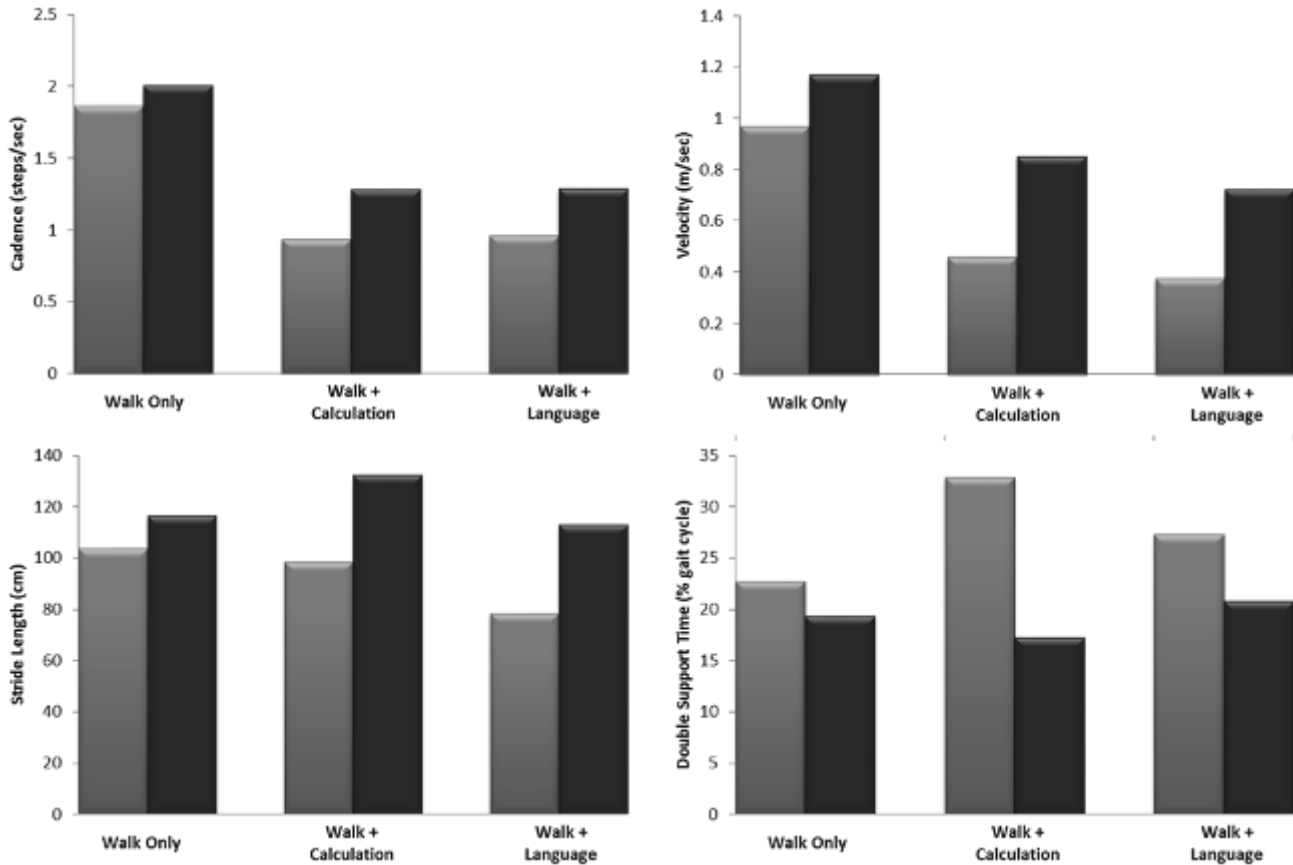


Figure 3

Velocity, cadence, stride length and double support time for Participant A before (grey) and after (black) participation in the Dance for Parkinson’s program.

For participant A, the combination of physical, emotional, social, and cognitive benefits of the program are evident in both his quantitative and qualitative results. Although a newcomer to dance, over time he wholeheartedly embraced the dance program and the community and continues to be actively involved. Being part of the dance class has also been a component in expanding his view on life and confidence. For example, as someone who enjoyed working with tools he initially expressed that this is something he no longer felt confident to do. By the end of the pilot program, he mentioned that he is working in a mentoring capacity and again feeling like he can work with his tools. He has also become more engaged in the conversations and world around him.

My daughters reckon I'm far more gregarious. I chat and I talk and before I used to sit there quietly without saying a word. But now I'm part of the discussion.

ARTISTIC CONNECTION TO DANCE AND RELATIONSHIP WITH QUEENSLAND BALLET

Attending dance classes at the Queensland Ballet studios at the Thomas Dixon Centre was stated by the participants as an important aspect of the overall success of the program. They shared that the QB facility provided an artistic atmosphere rather than a clinical one, which was highly valued. Participants felt that the environment encouraged social inclusion and that they were honoured to have a 'behind the scenes' interaction with the state dance company. Several participants shared how participating in the dance class helped to demystify ballet and encouraged the development of their dance literacy. The immediate connection to the company, through two of the company dancers participating as teachers, added excitement and a direct link to the inner-workings of a professional ballet company.

It was fantastic; it made us feel like we were really a part of Queensland Ballet, the community. And the opportunity to see those things that you wouldn't normally get to see, it was very enriching.

The opportunity to be immersed in the artistic culture of Queensland Ballet through the dance classes and the artistic connection to the company repertoire, was valued by the participants as providing depth and breadth to the program. Attending performances of *The Nutcracker* and *Romeo and Juliet* at the QPAC Playhouse Theatre were mentioned as important components of the program as a whole. Building classes on the ongoing repertoire of the company provided an opportunity to open a deeper dialogue and understanding of dance. Participants shared that they felt connected to the performances through the music and the choreography as well as understanding the narratives.

It's really opened my eyes a lot more about the ballet and inspired me to go to more performances, because now that you -- it's made that connection of what I was doing and even knowing how difficult it is for us to do some of the movements, because they're showing us and we're learning the terms, the first position, second position, plies, all that sort of stuff, it makes you feel part of it, and certainly understand more of what it's about.

This artistic connection as the focus brought in participants who stated that they might not normally participate in other Parkinson's based activities. The live music was repeatedly mentioned as an important aspect of class for everyone, providing enjoyment, connection to the work the company was performing as well as the positive influence that participants felt it had on their mobility. The live music brought a richness and further level of animation to the class observed in how the participants embodied musical energy in their creative choice-making, emotional responses or breaking out into song during class.

Well the music especially stays with me. The music from Romeo and Juliet...and I just love the fact that there is live music and [the pianist] has got such a great repertoire. That especially stays with me. And then when we went to the ballet, you know, I'm still thinking about that. It was just incredible. So learning the repertoire and bits of it that we could see on the stage and feeling like, we know that dance.



Throughout the course of the classes, some participants shifted from speaking of themselves as 'patients' or 'people with Parkinson's' to using language and descriptors that identified themselves as dancers. This was observed in the classes as well as in the individual interviews. They discussed a greater awareness of dance and movement outside of class in their observation of dance on TV, or in live performances. The creative dance elements of each class were described as providing an avenue to explore alternate means of expression, imagination and a means of validating each individual's unique approach to movement. There was a high level of adherence to the dance classes and dedication to the program and the community that developed. There is also motivation from the participants to support the program and to promote the program in the community, so much so that QB reached capacity for overall class numbers early in the Pilot Program.

Queensland Ballet also experienced a shift in its community programming through launching the Dance for Parkinson's pilot program. Not only has the program itself achieved its aims of offering an immersive artistic experience for members of the community affected by Parkinson's disease, it has also transformed the way QB approaches Education and Community programming. Learnings about the impact that the arts can have upon health, the inclusivity of QB's programming, and the infrastructure required to sustain such programming, have influenced key decisions for the QB Education program for 2015 and beyond. The Dance for Parkinson's pilot program is viewed as a positive expansion of the Education programs and QB has demonstrated commitment to sustaining and developing Dance for Parkinson's classes beyond the pilot program. Additionally, the company dancers involved in the program spoke of the benefits participating in the program has brought to their artistic and professional lives. The results of this Executive Summary and the full report will be utilised for ongoing program evaluation, advocacy, seeking further funding and developing further arts and health research opportunities.



CONCLUSION

This preliminary study concludes that the QB Dance for Parkinson's pilot program classes affected people living with Parkinson's in multiple ways including valuable physical, emotional, social, and cognitive benefits. For the majority of participants, one of the most challenging components of class was choreography that required dual tasking or coordination of the arms and feet simultaneously, incorporating musicality and narrative. While participants described it as a challenge, they also commented that it was good for them to work on and to have something to strive for. Mobility and gait with dual tasking are also the areas that showed the most positive change in the quantitative measurements through the TUG and gait cadence and velocity. Another significant benefit of the classes emerged as a result of the research: participants shared that their involvement in the dance class had been a gateway to further physical, social and artistic activities, emphasising the motivational aspect of the artistic experience in helping people with Parkinson's initiate and maintain a multi-faceted active lifestyle in the face of chronic disease. The dance experience itself is holistic as a physical, emotional, cognitive and social event. This initial and research report demonstrate the benefits of dancing for people living with Parkinson's as well as the potential for future research areas.

RESOURCES

Earhart, G. (2009). Dance as Therapy for Individuals with Parkinson's Disease. *European Journal for Rehabilitation Medicine*, 45(2), 231-238.

Heiberger, L., Maurer, C., Amtage, F., Mendez-Balbuena, I., Schulte-Mönting, J., Hepp-Reymond, M. & Kristeva, R. (2011). Impact of a weekly dance class on the functional mobility and on the quality of life of individuals with Parkinson's disease. *Frontiers in Aging Neuroscience*, 3(14), 1-15.

Houston, S. & McGill, A. (2011). *English National Ballet Dance for Parkinson's: An investigative study*. Roehampton University.

Shumway-Cook A, Brauer S and Woollacott (2000). Predicting the probability for falls in community-dwelling older adults using the Timed Up & Go Test. *Phys Ther*. 2000 Sep;80(9):896-903.

Westheimer, O. (2007). Why Dance for Parkinson's Disease. *Topics in Geriatric Rehabilitation*. 1-13.

CLINICAL ASSESSMENTS

Hoehn and Yahr

Hoehn, M. M., & Yahr, M. D. (1967). Parkinsonism: onset, progression and mortality. *Neurology*, 17(5), 427-442.

9-Hole Peg Test

Earhart, G.M., et al., *The 9-hole PEG test of upper extremity function: average values, test-retest reliability, and factors contributing to performance in people with Parkinson disease*. *Journal of Neurologic Physical Therapy*, 2011. 35(4): p. 157-63.

Fullerton Advanced Balance Scale

Development of the FAB

Rose, D.J., N. Lucchese, and L.D. Wiersma, *Development of a multidimensional balance scale for use with functionally independent older adults*. *Archives of Physical Medicine and Rehabilitation*, 2006. 87(11): p. 1478-85.

Mini BESTest

Leddy, A.L., B.E. Crowner, and G.M. Earhart, *Utility of the Mini-BESTest, BESTest, and BESTest sections for balance assessments in individuals with Parkinson disease*. *Journal of Neurologic Physical Therapy*, 2011. 35(2): p. 90-7.

PDQ-39

Peto, V., et al., *The development and validation of a short measure of functioning and well being for individuals with Parkinson's disease*. *Quality of Life Research*, 1995. 4(3): p. 241-248.

ABC Scale

Powell, L.E. and A.M. Myers, *The Activities-specific Balance Confidence (ABC) Scale*. *Journals of Gerontology Series A: Biological and Medical Sciences*, 1995. 50(1): p. 28-34.

GAITrite

The GAITrite^o mat, developed by CIR Systems Inc, (Clifton NJ 07012), is an electronic system consisting of sensors arranged in a grid like pattern which detect individual footfalls.

Bilney, B., M. Morris, and K. Webster, *Concurrent related validity of the GAITrite walkway system for quantification of the spatial and temporal parameters of gait*. *Gait and Posture*, 2003. 17(1): p. 68-74.

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