FLOW: The Effects of a Dance Program on the Self-Esteem of Pediatric Manual Wheelchairs Users

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Abstract

Dance has been established as a therapeutic tool for the disabled population through the intentional targeting of physical outcomes including gait, mobility, and balance. This has been documented through a multitude of research studies on the program Dance for PD (Parkinson's Disease) (Aguiar et al., 2016). Dance as a therapeutic tool to target psychosocial outcomes has not been well established in the literature, though. This 14-week doctoral capstone experience (DCE) highlights the benefits of dance as a therapeutic tool to target psychosocial outcomes including self-esteem and confidence. Due to the nature of the Skills on Wheels (SoW) program and their collaboration with Kids Dance Outreach (KDO), the target population for this capstone experience was pediatric manual wheelchair users (PMWUs). The pilot program, Fueling Life on Wheels (FLOW) is a wheelchair based dance program utilized to empower PMWUs to grow in their self-esteem and wheelchair skills confidence. The FLOW program took place over a two week period, structured as five one-and-a-half hour sessions. The single subject, repeated measures, convergent parallel mixed-methods data analysis found that self-esteem did increase amongst the participants. It also found that overall wheelchair skills confidence decreased amongst the participants. The caregiver interviews also provided support to the overall satisfaction of the program. This pilot program has established the need for further investigation on the effects of dance on the self-esteem and confidence of not only PMWUs, but also the larger community of disabled individuals. FLOW has been established as a sustainable program that will continue after this DCE. The findings from this DCE are being shared through professional publication and the furtherment of research on dance as a therapeutic tool for the disabled community.

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There are approximately 3.7 million wheelchair users in the United States of America. This includes both manual and powered wheelchair users. Of those 3.7 million wheelchair users, 124,000 wheelchair users are under the age of 21, 79,200 are under the age of 18 and 67,000 are under the age of 15 (Young & Crankshaw, 2021). Of these pediatric manual wheelchair users (PMWUs), only a small percentage receive wheelchair skills training. PMWUs acquire their wheelchair and are expected to independently learn how to navigate diverse environments. In 2021, Indiana University (IU) occupational therapy department identified a need. They recognized the demand for wheelchair skills training in the PMWU population.

To address this need, IU's occupational therapy department implemented the Skills on Wheels (SoW) program. This program originated at the Crann Centre in Co. Cork, Ireland. It has since been adapted to meet the individualized needs of PMWUs ages eight to seventeen within the greater Indianapolis area (Skills on Wheels, n.d.). IU's SoW program has implemented evidence-based wheelchair skills training to target wheelchair maneuverability and community navigation; all while following the Crann Centre's Model of Care. This Model of Care focuses on six services that provide a holistic and comprehensive approach. These six services include social capital, psychological well being, health and continence, education and career pathways, mobility, and independent living (Crann Centre Ireland, 2023). This model allows SoW to provide a personalized approach to best serve each PMWU and their family.

As diverse needs arose throughout the first three years of the SoW program, they determined their current programming was lacking the evidence to support the growth of PMWU's self-esteem and confidence. SoW decided to partner with Kids Dance Outreach (KDO)

to target these outcomes. KDO is a non-profit organization that provides free dance programs for children within the Indianapolis area. KDO currently has an adaptive dance program for individuals with Down Syndrome and similarly presenting diagnoses (Kids Dance Outreach, n.d.). They have the knowledge and expertise to utilize dance as a therapeutic tool for individuals with physical disabilities. In collaboration, SoW and KDO created the program Fueling Life on Wheels – FLOW. This program utilizes dance to promote the Crann Centre's original model of care. The purpose of this doctoral capstone (DC) report is to further investigate the effects FLOW, a dance program, has on the self-esteem and confidence of PMWUs.

Needs Assessment

When initiating the DCE surrounding FLOW, it was imperative to compile a community and site profile as well as conduct an interview with the directors, a gap analysis, and a literature review. This process allowed for a top down approach. This process began in the introduction with the community and site profiles addressing the population at large. These profiles also address the two organizations in collaboration to produce FLOW, SoW and KDO. A clear understanding of the sites and target population allows for a more specific focused clinical question. What are the effects of a dance program, FLOW, on the self-esteem and confidence of PMWUs? After the question was established, an interview was conducted to gather further information regarding the gap in the current programming.

The DC student conducted an initial interview with the DC faculty mentor and the DC site mentor. During this interview process the stakeholders were identified as the children participating in FLOW, their parents, the SoW team, the KDO team, and the overarching community of physically disabled children. The target outcomes were identified as self-esteem, confidence, and overall program satisfaction. The assessments to address these outcomes were

identified as the Rosenberg Self-Esteem Scale (RSES), Coopersmith Self-Esteem Inventory (CSEI), and Pediatric Wheelchair-User Fear of Falling Scale (P-WC FOF).

Through this interview the overall purpose of the FLOW program was identified. Through a therapeutic lens, SoW identified key aspects the program should include: opportunity for socialization, a fun and therapeutic environment, wheelchair skills training, and building confidence and self-efficacy. KDO identified the importance of aligning FLOW with their core values of inclusivity and confidence building. They also indicated the desire to expand their current disability dance program by creating sustainability through FLOW. Lastly, they emphasized the importance of further literature development on the effects of dance on the self-esteem of physically disabled children. To better understand the gap in programming the DC student then evaluated the current SoW's processes and compared it to the current population needs.

Among disabled children 18 years and younger, the wheelchair is the most widely used assistive mobility device (Young & Crankshaw, 2021). In addition to living with a disability, these children face difficulties learning how to maneuver their wheelchair and navigate their community. Since 2021, SoW has worked on creating an efficacious program to help PMWUs overcome the individualized physical challenges and barriers they face. While it is important to train children and adolescents on wheelchair skills, it is also important to address issues of confidence and self-esteem. This is where the gap in SoW programming arises. It does not currently measure confidence or self-esteem of PMWUs. In order to address the gap, SoW and KDO utilized FLOW, which aimed to incorporate both dance and wheelchair skills to target the identified outcomes.

There is also limited research on the efficacy of dance on improving confidence and self-esteem for PMWUs. A majority of research using dance as a therapeutic tool for physically disabled individuals comes from the program Dance for PD (Parkinson's Disease). The outcomes focused in this research are usually physical as opposed to psychosocial, such as gait, mobility, and balance (Aguiar et al., 2016). SoW and KDO would like to conduct and collect data on FLOW to add to the current body of literature utilizing dance as a therapeutic tool. Specifically, they would like to investigate the effect dance has on the psychosocial outcomes of PMWUs. In addition, they would like to advocate for dance as a therapeutic tool for individuals with disabilities.

Since the initial needs assessment was conducted, FLOW has been developed and implemented. It recruited participants and created a daily schedule. The pilot FLOW program took place over two weeks, structured as five one-and-a-half-hour sessions. The program used the three previously selected outcome measures (RSES, CSEI, and P-WC FOF) to measure self-esteem and confidence. The DC student assisted in the cohesion between SoW's core values and KDO's core values, made ongoing improvements to the program, and developed further literature regarding the program. Once implementation was completed, interviews were conducted with the participants' caregivers. These interviews were used to gather qualitative data on the effects FLOW had on the participant as well as the overall program satisfaction.

Since the implementation of the pilot FLOW program, the DC student recognized programmatic needs that directly affect the efficacy of the FLOW program. The DC student addressed these needs by improving the current FLOW program. These improvements included creating a workshop for the KDO staff to better understand individuals with disabilities, developing a program implementation timeline, and initiating the recruitment process earlier.

Through the interview process and initial needs assessment a gap in the current SoW programming was indicated. First, SoW's current programming had no means to address and measure self-esteem and confidence in the target population, and second, there was and still is limited research on this topic. The DC student worked on filling this gap by improving the current FLOW program. The next step in this DC process was to conduct a literature review. This literature review was utilized to further support the importance of establishing and improving the pilot program FLOW.

Literature Review and Gap Analysis Statement

In 2022 Ouellet et al. completed a study on a community-based, peer-led, wheelchair skills training program called Seating To Go. This study evaluated the effects Seating To Go had on participation satisfaction among pediatric wheelchair users with cerebral palsy and spina bifida. It also investigated the influence the program had on the children's wheelchair skills capacity and wheelchair use self-efficacy. Using the Wheelchair Skills Test (WST) the study found that there was a statistically significant difference ($p = 0.02$) in the children's wheelchair skills capacity from baseline to post-Seating To Go intervention. The study also found that the children had a statistically significant improvement in their confidence (Ouellet et al, 2022). This is important to note as the SoW program uses the same assessment as well as similar outcomes. This study provides supporting evidence in favor of the SoW program and its selected outcomes and assessments.

In further support of wheelchair mobility skills training programs for PMWUs, Sol et al. conducted a study in 2021. This study investigated the effects of wheelchair mobility skills and an exercise training program on the physical fitness, skills, and confidence in youth who utilize a manual wheelchair. This program utilized both occupational and physical therapists to conduct

the wheelchair mobility skills training program. Similarly, SoW uses occupational therapy students and practitioners to implement their programming.

Although this study utilized an exercise training program in conjunction with the wheelchair mobility skills training program, it produced evidence in support of the SoW program. Sol et al. found that the PMWUs had a significant improvement in confidence in wheelchair mobility and physical fitness when looking at pre-test, post-test and follow up (2021). Although SoW only utilizes a wheelchair skills training program, the evidence found in Sol et al.'s study supports this type of intervention for PMWUs. It is critical to investigate the literature in support of wheelchair skills training programs when considering the background and foundation of SoW. Since the development of the program, SoW has identified targeted outcomes they would like to address but are unable to address with their current programming.

While it is important to train children and adolescents on wheelchair skills, it is also important to address issues of confidence and self-esteem. Although children with varying abilities may face these issues, this DC project will specifically address PMWUs. In order to address these targeted outcomes, SoW and KDO created the adaptive wheelchair dance program, FLOW. In collaboration, they wanted to expand the current SoW programming to incorporate the intervention of dance. They also wanted to collect data on how dance affects self-esteem and confidence in PMWUs.

There is currently a lack of literature on the effects of wheelchair dance programs on the self-esteem and confidence of children and adolescents. To fully understand the benefits of dance on the target outcomes in PMWUs, it is important to evaluate the current state of the literature. Although there is deficient research pertaining to this specific population with these specific outcomes, there is supportive evidence that addresses diverse populations and outcomes.

In order to establish dance as a credible intervention method for individuals with disabilities, it is important to explore the research of dance on physical outcomes. Through a search of the literature it was found that dance is more commonly used as an intervention to target physical outcomes rather than psychological outcomes. Teixeira-Machado et al. completed a study in 2017 investigating the effects of dance on the functionality of individuals with cerebral palsy ages fifteen to twenty-nine. This study found that dance improves the "body function, activity, and participation by classification of functioning, disability, and health" (Teixeira-Machado et al., 2017). It also found that dance has a positive influence on balance and dexterity in individuals with cerebral palsy. This study provides evidence that dance has a positive impact on physicality of individuals with disabilities, specifically cerebral palsy. This is interesting to note as some individuals participating in SoW also have cerebral palsy. This is yet another important correlation to consider when evaluating the methodology behind SoW and the FLOW program. Overall, the findings from this study provides credibility of using dance as an intervention when working with the disabled population. The focus of the FLOW program was not physical outcomes, though. It was investigating the effects of dance on self-esteem and confidence in individuals with disabilities, specifically PMWUs.

When providing evidence in support of the FLOW program, the issue of self-esteem in children and adolescents with physical disabilities must be identified. When investigating the research, it was found that self-esteem in this population lacked substantial evidence. The last article pertaining to this criteria was published in 2006 by Miyahara and Piek. They compiled quantitative evidence on self-esteem in children and adolescents with physical disabilities through a meta-analysis. These physical disabilities included developmental coordination disorder, Cerebral Palsy, and Spina Bifida. The meta-analysis sought to understand the impact

physical disability had on young people's perceptions of self. They hypothesized that the self-esteem, physical self perception, social competence, and physical appearance of individuals with minor physical disabilities would be lower than that of individuals without a physical disability (Miyahara & Piek, 2006).

Thirteen studies met their inclusion criteria, which included both male and female participants ranging from ages four to eighteen. The studies used the RSE, the Coopersmith Behavior Rating Form, the Piers-Harris Children's Self-Concept Scale, the Perceived Competence Scale for Children, the Pictorial Scale for Perceived Competence and Social Acceptance for Young Children, and the Self-Perception Profile for Children. With use of these scales, the overall findings of the studies showed that children and adolescents with minor disabilities have lower perceived self-esteem, physical abilities, social acceptance, and physical appearance than that of children and adolescents without disabilities (Miyahara & Piek, 2006). This evidence provides support to the concept that children with disabilities have difficulties with self-esteem; which warrants further investigation. The fact that this article was published in 2006 proves the necessity for further literature development on this topic.

Assuming that children and adolescents with disabilities may have issues surrounding self-esteem, it is necessary to explore the use of dance to address this outcome. This concept correlates to the overall program outcomes of FLOW. The program seeks to explore the effects of dance on self-esteem of PMWUs. Salo investigated the effects dance had on the mental and emotional health and self confidence in young adults (2019). Her research was designed as a pre/post-test study with an exploratory, one day, community dance workshop that included both qualitative and quantitative analysis. The study included a pre-questionnaire, note-taking with an observational rubric, post-questionnaire, and an exit interview. The researcher found that dance

had a positive effect on self-confidence. She also reported that participants found dance as a means to express themselves and decrease levels of stress (Salo, 2019). The qualitative findings provide support for the use of dance to not only address, but also increase self-esteem. FLOW aims to address this outcome with PMWUs.

Not only has dance been proven to increase self-esteem in young adults without disabilities, but it has also proven to increase in older adults with PD. Dance for PD is a widely researched and utilized dance program to address symptoms of PD. Here was where another gap in the literature arose. Research on Dance for PD usually investigates motor function and quality of life outcomes. There were few articles published with the targeted outcomes of confidence and self-esteem. It is imperative to continue investigating and publishing research on Dance for PD with these outcomes, as it has set a precedent for motor function and quality of life outcomes. This will encourage future research incorporating diverse disability populations on the effects of dance on self-esteem.

In 2022, Feenstra et al. published an article on the effects of dance on self-esteem and quality of life in individuals with PD. The study included thirty-six individuals with PD participating in one sixty-minute dance class a week, for twenty-two weeks. The RSE was utilized to measure self-esteem before and after the twenty-two week intervention. It was found that self-esteem had significantly improved (Feenstra et al., 2022). This data complements the notion that dance improves self-esteem in individuals with disabilities. Although the population FLOW is concerned with is PMWUs, this article provides support to the concept of using dance to improve self-esteem in individuals with disabilities.

The evidence has shown that dance can be used as an intervention to target self-esteem and confidence in young adults without disabilities and older adults with PD. When considering

the foundations of the FLOW program, it was important to investigate the evidence on the effects of dance on disabled children, adolescents, and young adults. In 2019, Aujla and Needham-Beck evaluated the effect of dance on the subjective well-being of disabled dancers between the ages of ten and twenty-five. Their disabilities consisted of intellectual: Down Syndrome and autism spectrum disorder, physical: cerebral palsy, hip joint conditions, or tyrosine hydroxylase deficiency, or a combination of both: global developmental delay, Noonan's syndrome, achondroplasia, and chromosome 18p depletion. This study found that the participant's had high levels of subjective well-being at the beginning and end of the inclusive, extra-curricular, talent development program. Although this study did not find a statistically significant change, it noted that the program potentially contributed to the maintenance of the participant's overall wellbeing.

This study has both similarities and differences to the FLOW program. They both used dance as an intervention to target their outcomes. A major difference between these two programs was their populations. Aujla and Needham-Beck's study targeted individuals with a wide range of disabilities while the FLOW program specifically targeted PMWUs. This is important to note that although dance is used as the intervention for both programs, the outcomes may differ due to the target population and administrative procedures.

Upon further exploration of the current literature, one article addressing the effects of dance on the self-esteem of PMWUs was identified. De Villiers et al. conducted a study in 2013 to evaluate the effects of wheelchair dancing on the self-esteem of adolescents with physical disabilities. The study included twenty-two students, mean age of fifteen years old, from a school that accommodates individuals with physical disabilities. Eleven participants were selected for the control group and eleven for the experimental group. The physical disabilities of the adolescents included in the study were cerebral palsy, osteogenesis imperfecta, epilepsy,

paraplegia, scoliosis, head injury, spina bifida, and spinal muscular atrophy; all who were wheelchair bound. The dance sessions were administered to the intervention group over a four week period. The Janis-Field Feelings of Inadequacy Scale (JFS) was used to measure levels of self-esteem. The JFS was administered before and after the twelve one-hour wheelchair dance sessions.

After completion of the intervention and re-administration of the JFS, the researchers found that 54.5% of the control group experienced an increase in self-esteem while 72.7% of the intervention group experienced an increase. They came to the conclusion that wheelchair dancing may positively affect self-esteem in adolescents with physical disabilities (de Villiers et al., 2013). Although this study was conducted in 2013, it was one of the only studies to provide evidence on the efficacy of dance on self-esteem in PMWUs.

This presents a clear gap in the literature on this subject. The purpose of FLOW is not only to address self-esteem in PMWUs but also to further develop the existing collection of research on this topic. Through appraisal of the current literature it is appropriate to assume that individuals with disabilities experience issues with self-esteem. It is also appropriate to assume that through the use of dance, self-esteem can improve. This has been identified in the populations of non-disabled, young adults; individuals with PD; disabled, young adults; and disabled, adolescent wheelchair users. FLOW seeks to address self-esteem in PMWUs and add to the current state of the literature. Although dance has proven to increase self-esteem in multiple populations, the literature is still deficient when considering FLOW's target population. It is vital to contribute to the collection of evidence-based data on the efficacy of dance on self-esteem and confidence, particularly in PMWUs. This will encourage the use of dance as an

intervention amongst varying populations, as they too deserve to reap the benefits of dance on self-esteem and confidence

Driving Theory

After a thorough search of the literature, the DC student highlighted a common theme in supporting theory: in alignment with the current body of research, SoW utilizes Disability Theory to guide their processes and program development. At the center of Disability Theory is the individual. This theory takes into consideration not only the physical attributes of the individual, but also the social and personal characteristics which influence that individual's daily routines (Edwards & Imrie, 2003). SoW used this theory by incorporating a social support system among PMWUs and their families. It also addressed the physical barriers these children face as they navigate their manual wheelchairs. Throughout the creation of SoW and affiliated programs, Disability Theory can be distinctly seen throughout.

When SoW and KDO collaborated to create the FLOW program, a second supporting theory emerged, the Adlerian theory. This theory supports the idea that humans are social in nature, behavior has social meaning, and behavior is embedded through socialization (Carlson & Englar-Carlson, 2017). Carlson and Englar-Carlson highlight the "hallmark of Adlerian theory is the emphasis on social interest, which is a feeling of cooperation with people, the sense of belonging to and participating in the common good" (2017). FLOW encapsulated this theory by socializing through the act of dance. The FLOW program allowed for a common space where individuals of varying abilities belong. The program had a common goal of supporting each participant, encouraging growth in self-esteem and confidence, and having fun. The FLOW program used Adlerian theory in order to produce a supportive social environment for all participants.

The FLOW program utilized dance and community as a means of embracing the two identified theories. KDO team members and IU student volunteers encouraged the participants to embrace their full physical and social potential by providing clear instruction and age appropriate feedback. This information allowed the participants to embody dance through empowerment and socialization. Creating an inclusive environment allowed for the participants to embrace themselves and collectively share in the benefits of dance as a therapeutic tool including improved self-esteem and confidence.

In addition to the guiding theories, it was important to understand the role occupational therapy provided when creating and implementing the FLOW program. Occupational therapy concepts provided expertise to this program through their focus in biomechanics, functional movement and mobility aids, childhood development, and mental health practices across the lifespan. In addition, occupational therapy is keen on advocating for their clients and their profession as well as providing evidence-based practices. SoW and KDO required assistance in improving their FLOW program while also documenting qualitative and quantitative data to report on the efficacy of the program. This allowed for sustainability within their programming while also promoting the growth and further development of dance as a therapeutic tool among PMWUs. Through an occupational therapy lens, the DC student was able to address these needs.

Capstone Plan and Process

Goals

In alignment with the needs assessment and literature review, three project goals were identified to further guide the DC process. The DC student collaborated with the DC faculty mentor and the DC site mentor to determine goals that would best serve the target community. The main focus of these goals were to produce literature on the use of dance as a therapeutic

tool, make programmatic improvements to FLOW, and gain clinical skills to apply at SoW and KDO's adaptive dance programs. The identified goals helped address the program and the population at large.

Project Goal 1: The student will demonstrate proficiency in collecting and analyzing quantitative and qualitative data to gain insight on the efficacy of dance as a therapeutic tool for increasing self-esteem and confidence.

Objective 1: The student will collect pre/post-assessment data regarding the FLOW program using the RSES, CSEI, and P-WC FOF.

Objective 2: The student will conduct caregiver interviews via a 6-week follow up Zoom call to collect qualitative data on long-term effects and overall program satisfaction.

Objective 3: The student will accurately analyze and document the quantitative and qualitative data using Excel to analyze the quantitative data and Dedoose to analyze the qualitative data.

Project Goal 2: The student will ensure sustainability of the FLOW program to further promote the use of dance as a therapeutic tool for PMWUs and like populations.

Objective 1: The student will create a Dancers with Disabilities presentation for future FLOW volunteers to promote best practice and inclusivity throughout the program.

Objective 2: The student will create a timeline for the next iteration of FLOW to better incorporate SoW and KDO's programmatic values and goals as well as promote the consistency of programming from year to year.

Objective 3: The student will publish the findings of this DC project in a peer reviewed journal, adding to the growing body of literature that supports dance as a therapeutic tool for disabled communities.

Project Goal 3: The student will develop clinical skills regarding wheelchair fittings as well as gain knowledge of working with dancers with disabilities to promote best-practice throughout the SoW and FLOW program.

Objective 1: The student will shadow Tiffany Stead at Riley Hospital for Children to develop adaptive equipment knowledge and expertise.

Objective 2: The student will assist Tiffany Stead in the recruitment of SoW participants and the initial evaluation process in order to provide SoW with appropriate participants.

Objective 3: The student will assist KDO staff as a teaching assistant for children with disabilities during dance classes, rehearsals, and their Event of the Year.

Doctoral Capstone Timeline

To meet the identified goals and objectives, the DC student outlined a timeline to guide the project implementation and process. The timeline was organized into six phases: IRB completion and project preparation, project implementation, quantitative data analysis, programmatic improvements, qualitative data collection and analysis, and dissemination preparation. In table 1, a brief description of the tasks completed during each phase are listed.

Table 1

Doctoral Capstone Timeline

Phase	Tasks
Phase 1, IRB Completion and Project preparation: Week 1	Connect with IRB reviewer to finalize IRB before start of program Connect with participant's families and volunteers Organize participant folders with assessments and consent/liability waivers
Phase 2, Project Implementation: Week 2-3	Administer pre/post-assessments to participants Assist KDO by modeling the dance moves

	and choreography to the participants
Phase 3, Quantitative Data Analysis: Week 4-5	Scan assessments and input data points to the SoW OneDrive Use Excel to analyze quantitative data points Begin documenting quantitative data analysis in first draft of research report
Phase 4, Programmatic Improvements: Week 6-9	Create program timeline for next iteration of FLOW in collaboration with DC site mentor and DC faculty mentor Create a dancers with disabilities presentation to share with future FLOW volunteers Begin first drafts of research report
Phase 5, Qualitative Data Collection and Analysis Week 10-12	Schedule and conduct parent interviews on long-term effects of FLOW and overall program satisfaction Utilize Dedoose to analyze qualitative data and identify commons themes
Phase 6, Dissemination Preparation: Week 13-14	Finalize research report and begin publication process

Project Implementation

Participants

In order to participate in the FLOW program, the participants must have met the following inclusion criteria: children ages six to seventeen who self-identified as manual wheelchair users. At the time of recruitment, seven participants meeting this inclusion criteria completed the initial paperwork to become part of the pilot program. Three out of the seven participants attended and participated in the program. To account for initial attrition, the research team contacted the families of the participants who chose not to attend. The main reason the four participants did not attend was involvement in other organizations such as basketball and cheerleading.

Participant 1 was an 8-year-old boy with a diagnosis of cerebral palsy who showed symptoms indicative of a cognitive delay. He attended 4 out of the 5 sessions. Participant 2 was a 9-year-old girl with a diagnosis of spina bifida. She attended 5 out of the 5 sessions. Participant 3 was an 8-year-old girl with a diagnosis of cerebral palsy who also showed symptoms indicative of a cognitive delay. She attended 5 out of the 5 sessions. Table 1 outlines the participant demographics documented through the participant interest form. Pre-assessment data was collected on all three participants while post-assessment data was collected only on Participant 1 and Participant 2. For purpose of this paper, the results section discusses Participant 1 and Participant 2 data results only.

Table 2

Participant Demographics

Participant	Gender	Age	Diagnosis
Participant 1	Male	8	Cerebral Palsy
Participant 2	Female	9	Spina Bifida
Participant 3	Female	8	Cerebral Palsy

Recruitment

Considering the research conducted in this study used human subjects, the IU Institutional Review Board (IRB) must have approved the protocol. Before initiating participant recruitment the IU IRB approved Protocol 17065 - Fueling Life On Wheels: A study of the impact of mobility training within a dance program for wheelchair-using children. Once this was approved, participant recruitment began.

The initial recruitment process began by word of mouth, flyers, email, and social media. SoW sent an informational email to their participants' families requesting interest in the FLOW

program. This email included a description of the FLOW program as well as when and where it would be taking place. The initial recruitment email contained prompts requesting information on the participant's name, gender, age, diagnosis, additional assistive equipment use, direction following abilities, additional support needs, and propulsion status. This email also requested clearance from a doctor for physical activity.

KDO used their Indianapolis Public School (IPS) system contacts to distribute flyers. Similarly to SoW recruitment emails, KDO's flyers contained a description of FLOW, when and where it will be taking place, and a quick response (QR) code. This QR code contained prompts requesting similar information to SoW's initial recruitment email. After interest was solidified, the participants and participant's families read and signed all consent and waiver forms. Before the start of the program, the families of the participants filled out four forms: Photo Release Form, Assumption of Risk and Release form Liability, COVID-19 Assumption of Risk and Release form Liability, and either the Indiana University Assent to Participate in Research or the Indiana University Informed Consent Statement for Research. Once these were filled out, the pre-assessments were administered.

Outcome Measures

This research study utilized four outcome measures, the RSES, CSEI, and P-WC FOF and parent interviews (see Appendix A). The three assessments were used in a single subject, repeated measures, convergent parallel mixed-methods design. They were administered before the start of the program and at the end of the program. The RSES is a 10-item, self-report, 4-point likert scale used to evaluate individual self-esteem. The ten statements regard feelings about oneself. The choices on the likert scale range from strongly agree to strongly disagree. The CSEI is a 58-item, self-report inventory used to evaluate an individual's feelings about oneself.

The directions prompt the individual to mark an “X” in the “Like Me” column if the statement describes how the individual usually feels or an “X” in the “Unlike Me” column if the statement does not describe how they usually feel.

There is a correlation between fear of falling and level of wheelchair use confidence. The P-WC FOF utilizes Likert scales and a “drag and drop” function. It is both a self-report and caregiver-report measure. The measure strategically mentions wheelchair mobility skills that are commonly associated with falls such as sideways tips and wheelies. The measure asks the participant if they complete these skills by themselves. It then asks if the participant avoids these skills due to a fear of falling. The caregiver is then asked the same questions. This data is used to determine the participant’s level of wheelchair use confidence.

Six weeks after the conclusion of the program, the DC student conducted semi-structured interviews with participants’ caregivers via Zoom calls. This semi-structured interview acted as a 6-week follow up to gain a better understanding of the lasting effects of the FLOW program. The included questions inquired about the long term effects the program had on the participant’s self-esteem and confidence. They also inquired about the overall satisfaction of the program. It was lastly used to determine areas of programmatic improvement.

Project Components and Implementation

The pilot program FLOW took place in January of 2024 on the 16th, 18th, 23rd, 25th, and 26th. It was structured as a two-week program meeting twice a week for one-and-a-half hours, ending in a final showcase. The participants began the program by participating in a warm up with KDO staff, the participants' caregivers began by filling out the pre-assessments. The assessments were designed as self-report measures. But due to the level of cognitive function of

each participant, it was determined that the caregiver would fill out the assessments. This also allowed the child more time to spend dancing.

KDO staff led each session while IU students provided support to the participants. Each session started with a structured warm-up. The first half of warm-up was facing the first teaching artist at the front of the room. The second half of the warm-up was facing the second teaching artist at the back of the room. The warm-up promoted active range of motion in the upper extremities and trunk. It consisted of tapping on body parts, reaching, circular movements, etc. The warm-up also promoted simple wheelchair skills including rolling forwards, rolling backwards, and turning left and right. Once the warm-up was completed, the KDO staff was ready to begin teaching the choreography.

The choreography material was taught in four parts: A, B, C, and D. This allowed the participants to learn the material in short sequences. As the sessions progressed, the KDO staff began putting parts A, B, C, and D together. This allowed for a cohesive, choreographed dance. The children required specific, individualized support throughout this process. This support was provided by both IU students and KDO staff. In addition to the warm-up and the choreography, games were dispersed throughout each session.

The games consisted of the “Name Game”, “Fruit Salad”, and “Recall, Repeat”. The “Name Game” consisted of all participants standing in a circle. The game started with one participant saying their name and pairing it with a movement, then every other participant repeated the name and the movement. This continued until each participant in the circle said their name and paired it with a movement. The “Fruit Salad” game consisted of one instructor at the front of the room. This instructor called off different fruits. Each fruit had a specific movement attached to it. The instructor continued to call off different fruits and the participants had to

remember the specific movement that correlated to that fruit. The last game was “Recall, Repeat” . This game consisted of the instructor and participants utilizing boomwhackers. The instructor would create a short eight count rhythm with the boomwhackers. The participants were then expected to recall the rhythm and repeat it back to the instructor with their boomwhackers.

These games were distributed throughout each session differently. They were placed either before, between, or after warm-up and choreography sections. The games were used at the beginning of class to allow the participants to become comfortable with the volunteers and class instructors. Games were used in between the warm-up and the learning material to provide a fun break for the children and promote attention throughout the rest of the class. Games were presented at the end of class to promote familiarity and to end with completion of a successful task. As the children grew comfortable in the space they had the ability to choose which game they wanted to play.

At the end of each session we ended with a good-bye. At the end of the last session we ended with a showcase for family, friends, and community members. After the final performance was finished, the caregivers participated in filling out the post-assessments. The participants were encouraged to join SoW in the spring for their wheelchair skills training program. Six weeks after the final performance parent interviews were conducted. These interviews were used to determine necessary programmatic improvements.

Programmatic Improvements

After the program was implemented, the DC student, sit mentor, and faculty mentor worked together to create materials to improve the next iteration of FLOW. The DC student created an educational resource for future volunteers. This resource included information on common diagnoses and characteristics of wheelchair users. It also included adaptations and

modifications that can be incorporated into the next FLOW program. It lastly included information on inclusive language. This educational resource was presented to KDO team members.

Through continued communication between SoW and KDO, the next iteration of FLOW began to develop. The collaborators selected the dates and created recruitment materials. Initial recruitment for the next iteration of FLOW occurred during the SoW spring program. KDO workshopped a 30-minute dance program for the SoW participants. Parents were then handed the recruitment flyer and encouraged to sign up. Initiating the recruitment process earlier allows KDO and SoW to potentially gain more participants for the next iteration of FLOW.

Project Evaluation and Results

Assessment Administration

The RSES, CSEI, and P-WC FOF were administered as a single-subject, repeated-measures, convergent parallel mixed-methods design. Two SoW research assistants and one SoW Capstone Student administered the RSES, CSEI, and P-WC FOF. To increase reliability, the same individuals administered all three assessments to the same participants at time one and time two. These individuals received the assessments one week in advance. This allowed them the opportunity to become familiar with the assessments. Although all three assessments were self-report, the administrators were utilized to answer questions the participants and participants' caregivers had.

Data Collection and Analysis

The RSES and CSEI were completed via paper and pen questionnaires. The P-WC FOF was completed via qualtrics. The RSES and CSEI were manually scored and entered into an excel spreadsheet. Line graphs were then created from the data in the spreadsheet. The DC

student exported the P-WC FOF data from Qualtrics and imported the data into excel spreadsheets. The data was then analyzed into line graphs. Caregiver interviews were conducted and recorded via Zoom calls. These interviews were then transcribed and imported into Dedoose. Dedoose was used to code and thematically analyze the caregivers' interviews. This information was then synthesized into the results section of the DC report.

Results

Rosenberg Self-Esteem Scale and Coopersmith Self-Esteem Inventory

Both Participant 1 and Participant 2 showed an increase in self-esteem from the pre-assessment to the post-assessment. On the RSES, Participant 1 demonstrated an increase of 12 points and Participant 2 demonstrated an increase of 6 points. Figure 1 displays the participants' total scores on the RSES. On the CSEI, Participant 1 demonstrated an increase of 14 points and Participant 2 demonstrated an increase of 8 points. Figure 2 displays the participants' total scores on the CSEI. On the CSEI, Participant 1 showed an increase in the General Self, Home/Parents, and School/Academic subsections. The Social Self/Peers subsection remained the same from pre-assessment to post-assessment. Participant 2 showed an increase in General Self and School/Academic subsections. The Social Self/Peers and Home/Parents subsections remained the same from pre-assessment to post-assessment. Figures 3 through 4 display the participants scores

Figure 1

Participant Rosenberg Self-Esteem Scale Scores

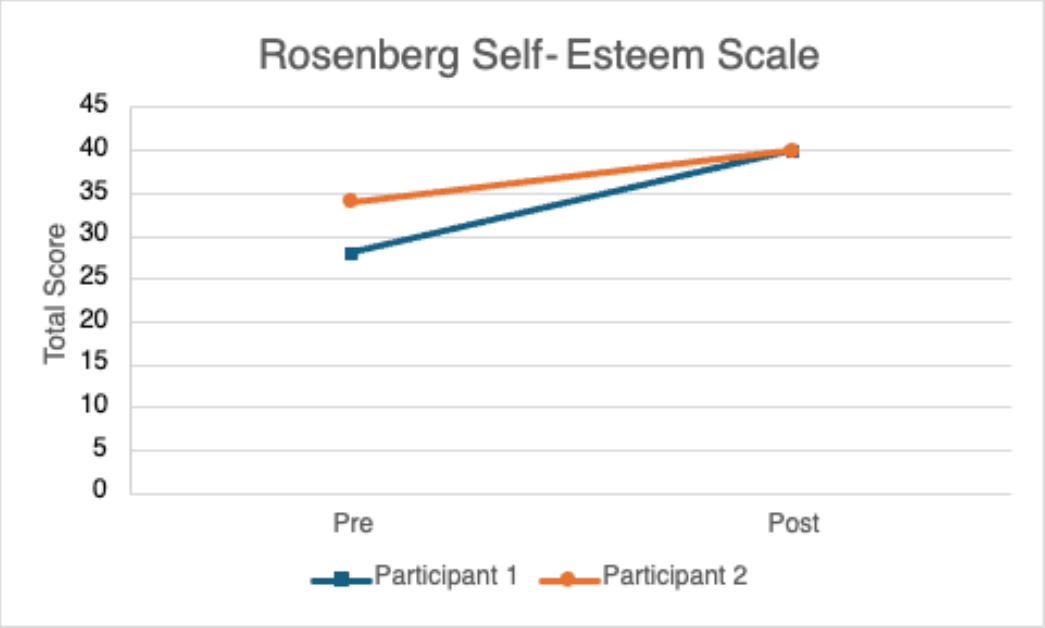


Figure 2

Participant 2 Coopersmith Self-Esteem Inventory Subscale Scores

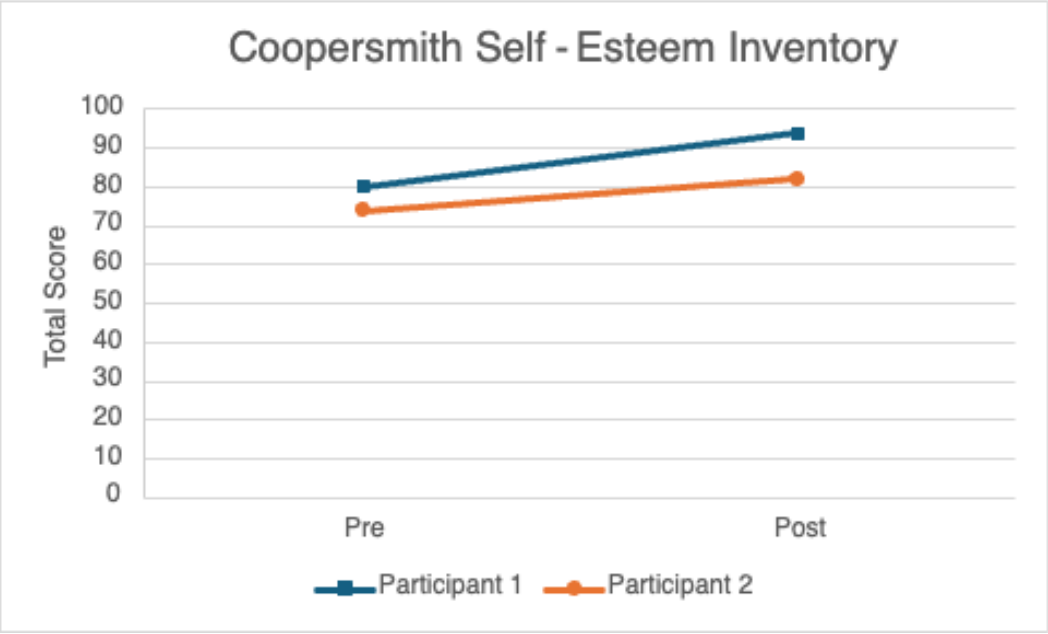


Figure 3

Participant 1's Coopersmith Self-Esteem Inventory Subscale Scores

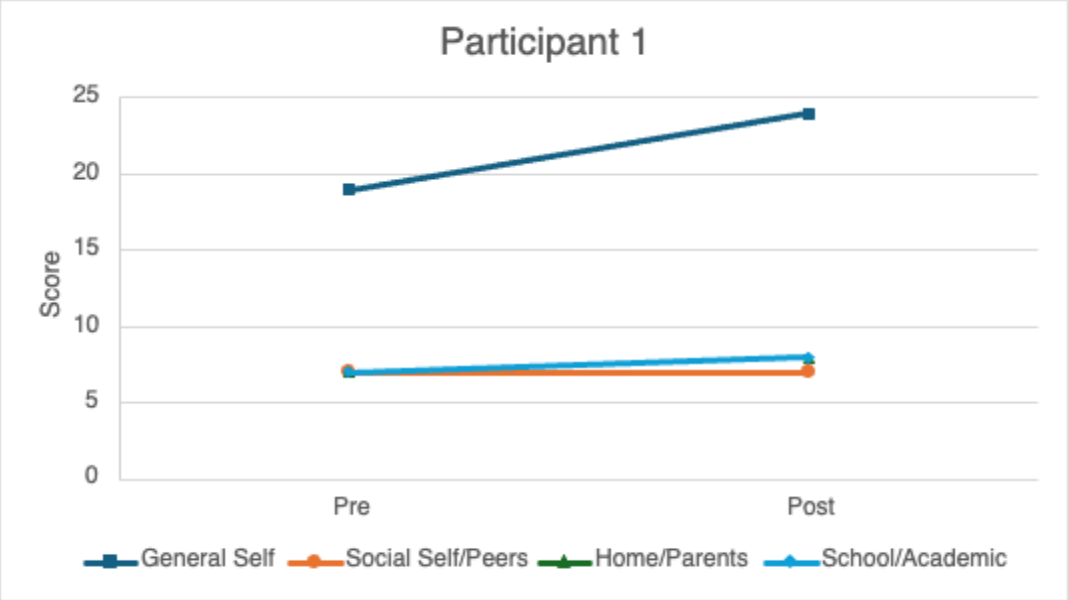
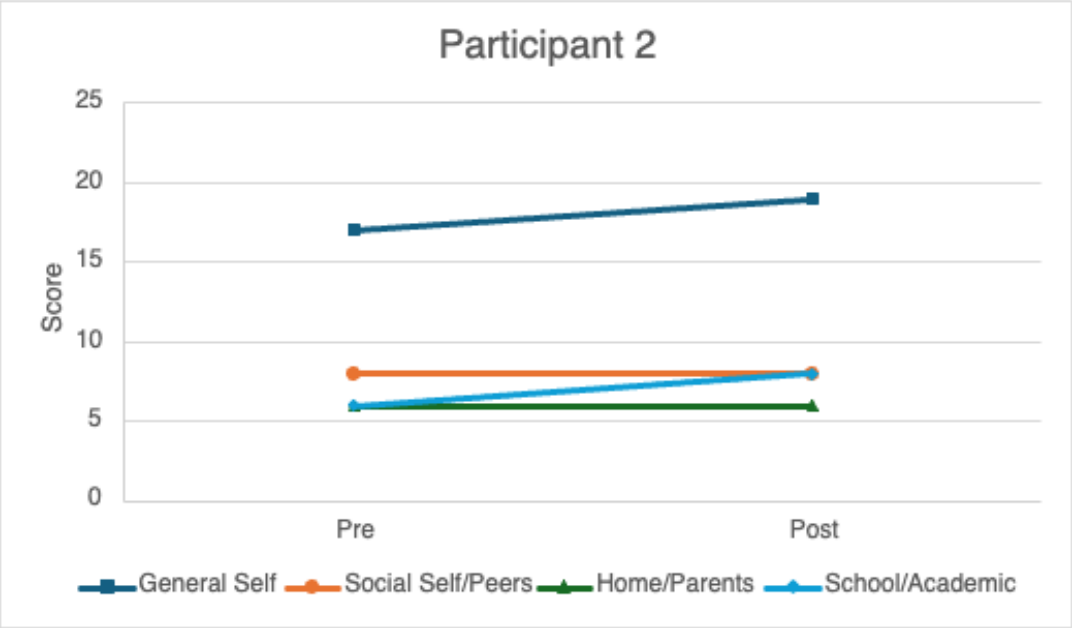


Figure 4

Participant 2's Coopersmith Self-Esteem Inventory Subscale Scores



Fear of Falling Scale

When considering the P-WC FOF it is important to note that some items were left blank on both participants pre- and post- assessments. This was reflected in the data analysis by decreasing the total possible points to the number of items answered. The P-WC FOF findings are documented as percentages in order to reflect accurate correlations. Participant 1 had a 13.83% decrease in fear of falling from the pre-assessment to the post-assessment. Participant 2 had a 0.7% increase in fear of falling from the pre-assessment to the post-assessment. Figure 5 displays the difference in the participants' fear of falling score before and after the program. Participant 1's caregiver showed a 14.05% increase in the perceived fear of falling of their child from the pre-assessment to the post assessment. Participant 2's caregiver showed a 16.57% increase in the perceived fear of falling of their child from the pre-assessment to the post-assessment. Figure 6 displays the difference in the caregivers' perceived fear of falling score before and after the program.

Figure 5

Participant Fear of Falling Scale Scores

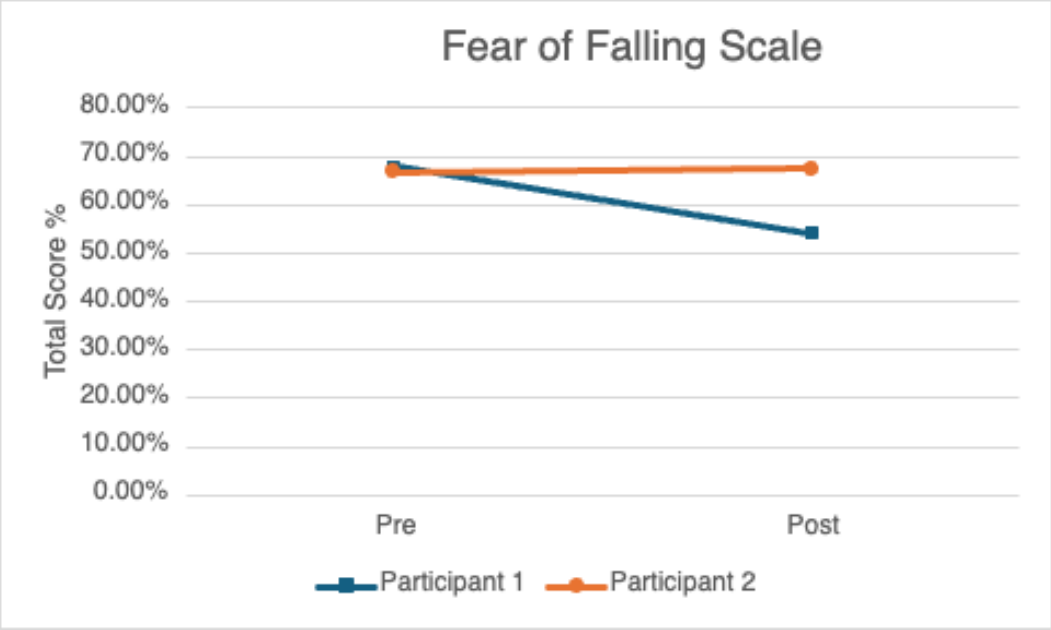
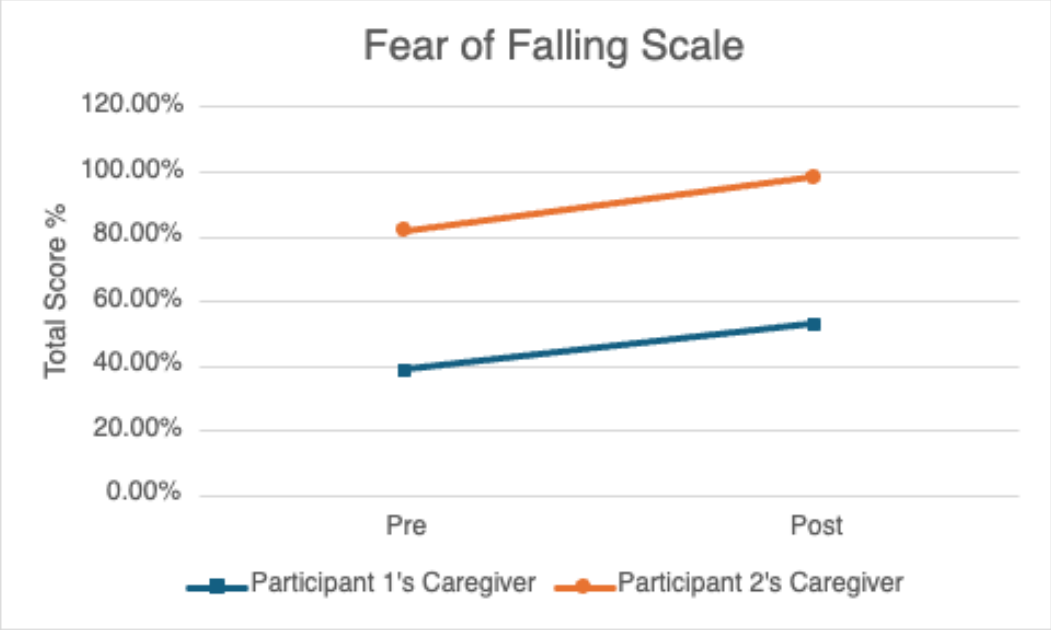


Figure 6

Caregiver Fear of Falling Scale Scores



Caregiver Interviews

Caregiver interviews were conducted 6 weeks after the program. The interviews focused on the caregiver's satisfaction of the current programming as well as the post-programmatic effects on the participant. Lastly, the interviews allowed the caregivers to provide any additional feedback on the program including suggestions for future iterations of the program. After using Dedoose to code the caregiver interviews, four common themes arose: the current environment of FLOW, the participant's perceived self before the program, the effects FLOW had on the participant, and programmatic improvements.

Participant 1 Caregiver Interview.

Participant 1's caregiver was the only caregiver to mention their child's perceived self before the start of the program. They mentioned that Participant 1 was very outgoing and confident before the start of the program. They also mentioned that Participant 1 had experienced positive effects since the program. Participant 1's caregiver stated they had seen Participant 1 engaging in more dancing and structured play. They shared that he had shown increased self-expression, self-esteem, and self-confidence since the program. Participant 1's caregiver also mentioned that they too have viewed Participant 1 differently since the program. The caregiver shared that they had been assuming competence in their child more frequently. They were proud of what their child accomplished during his time at FLOW. They were so confident in Participant 1's abilities that they signed him up for 4 summer programs. Not only did the FLOW program positively impact Participant 1, but it also positively impacted the way Participant 1's caregiver perceived their child. Participant 1's caregiver also mentioned that the program created a supportive and accepting environment that provided opportunity for inclusion, individuality, creativity, and joy. They also mentioned that Participant 1 particularly enjoyed the performance

aspect of the program. Lastly, Participant 1's caregiver provided feedback and suggestions for the next iteration of FLOW. They mentioned they would like to see more modified movements for children who process visual and auditory information at a slower speed. They also mentioned it would be beneficial to include all children in wheelchairs, including children who do not self-propel.

Participant 2 Caregiver Interview.

Participant 2's caregiver did not mention the participant's perceived self before the start of the program. Instead, this interview was focused on the current environment of FLOW as well as the effects FLOW had on the participant. Participant 2's caregiver shared that the program provided a supportive environment that encouraged connection, creativity, individuality, and joy. They particularly enjoyed the modified movements that were provided to the participants. Participant 2's caregiver also highlighted the positive effects the program had on Participant 2. These included increased confidence and mobility in her chair as well as increased self-confidence, self-esteem, and self-expression. They also mentioned that Participant 2 has been dancing more since participating in the program. Lastly, Participant 2's caregiver mentioned they were satisfied with the entire program and had no suggestions for future iterations.

Discussion and Impact

Discussion

The DCE was successfully implemented through the FLOW program and subsequent data collection. The primary hypothesis of this DCE was that participating in a dance program would increase the self-esteem of the participants. Both participants in fact showed an increase in self-esteem as shown through the RSES and CSEI results. Statistical significance was unable to be determined for these two measures due to the small sample size.

The secondary hypothesis of this study was that engaging in dance would decrease the participants' fear of falling and thus increase their wheelchair skills confidence. This in fact did not happen; overall, fear of falling increased. This may have happened due to the nature of dance. Dance elicits vulnerability both physically and mentally. Physically, dance pushes individuals outside of their comfort zone. Although our participants were never asked to complete unsafe movements, they may have felt outside of their comfort zone. Participants completed arm and trunk movements as well as wheelchair movements that they may not have explored before the program. The unfamiliarity of these novel movements may have increased their overall fear of falling.

As established in the literature review, there is limited research on the effects of dance on the psychosocial outcomes of individuals with disabilities. There is even less research on the effects of dance on the psychosocial outcomes of children with disabilities and even less when considering PMWUs. This study was designed to examine the effects of a dance program on the self-esteem and confidence of PMWUs. This DCE allowed for the production of a research report and the initiation of it being peer-reviewed for journal submission. As stated in the needs assessment and literature review there is a current lack of research in this area. This DCE will allow for research to continue in this area of interest. It is important to examine the effects dance has on individuals with disabilities; both physically and mentally. This allows for the further investigation of dance as a therapeutic tool for PMWUs.

Limitations

As a pilot study there were limitations to the data collection and analysis. The first being a small sample size. In order to provide evidence with statistical significance, it is important to increase the sample size in future FLOW iterations. A large limitation in the study was the

self-report assessments. Due to the participants' level of cognitive understanding, they were unable to complete the three assessments used in this study. The caregivers of the participants filled out the assessments. This produced a potential for bias. The caregivers may have been reluctant to answer honestly. It is also difficult to gain an accurate understanding of the participants' view of their individual self-esteem and confidence as their caregivers used their own perception of the participants' individual self-esteem. Lastly, there was a language barrier with participant 2's caregiver. Although an interpreter was used, the DC student does not know the extent to which the language barrier affected the results.

Impact

The DC project allowed for dance to be utilized as a therapeutic tool amongst PMWUs. Not only were the participants able to practice wheelchair skills, but they were also able to express themselves. SoW achieved the goal of using dance to target self-esteem and confidence in PMWUs. It was found that self-esteem increased for both participants. Although self-esteem was the primary outcome being investigated, there were many more positive outcomes. The participants were able to express themselves through their movements. The participants were also able to experience a supportive community that assumed their competence. The KDO team and IU OTD volunteers encouraged the participants to engage with the program and the choreography to the best of their ability. This environment allowed for the participants to grow their confidence in their abilities.

Although the program was successful in creating a safe and supportive environment, there is still room for improvement. For the next iteration of FLOW, it was suggested that participant recruitment start earlier in the planning process. This will allow for more children to participate in the program. The effects of this program will then be extended to more PMWUs

and their families. It is also important to continue to utilize the IU volunteers in an effective manner. This may include physical support for the participants or coordinating administrative tasks. Lastly, it is important to continue to provide modified movements for the participants. Due to specific participant characteristics, not all participants were able to complete all choreographed movements. It is important for the future iterations of the program to be prepared with modifications. This should include physical movements and teaching techniques. Not all children learn the same way, and it is important to meet the participants at their current level of functioning. This will allow for the success of all participants. Keeping this in mind will increase the effectiveness and overall impact of the FLOW program.

Conclusion

Utilizing dance as a therapeutic tool to target self-esteem and confidence in PMWUs has been proven successful through the FLOW program. Dance is a tool that can be used to express oneself and challenge the individual both mentally and physically. This is an important concept to consider when establishing the longevity of the FLOW program. Although it is important to address self-esteem and confidence in this population, it is also important to consider the general benefits of dance. This has been noted throughout the current state of the literature. It is important to grow the current body of literature and expand the research on the effects of dance on children with disabilities, specifically PMWUs. In order to continue this program, it is imperative to continue to provide a safe and supportive environment for children to freely express themselves. This will further develop the program and further add to the body of literature utilizing dance as a therapeutic tool.

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Appendix A

Caregiver Interview questionnaire

FLOW: **Family Semi-Structured Interview** (6-week follow-up)

1. Now that 6 weeks have passed since completing FLOW, what still stands out to you as being the most impactful part of the program?
2. What changes have you seen in your child in the past 6 weeks that are related to FLOW?
    a. *Possible themes: Physically; Emotionally/psychologically (Self-efficacy); Occupation-related*
3. Do you feel that this program has impacted your child's mobility at home? At school? What does that look like?
4. Do you feel that this program has impacted your child's self-esteem at home? At school? What does that look like?
5. Do you feel that this program has impacted your child's confidence at home? At school? What does that look like?
6. What components of FLOW need to improve, and why?
7. If you were to complete the program again, what skills would you want to focus on?
    a. *Show growth and progression – what skills were gained throughout pilot program*
8. What FLOW resources did you utilize most?
    a. Kids Dance Outreach instructors
    b. OT Student involvement
        i. What about the students that you saw working in the program with your kid – would you change anything about those interactions and their

involvement? What does it mean to have OT students involved in the training?

c. OTR involvement

9. How was this program unique from other programs or services you may have participated in or received in the past?
10. What feedback do you have regarding program design?
    a. *Including accessibility of program location, effectiveness of communication before/during/after program, dates and timing of the program*
11. Do you have any other comments or feedback that you would like to share?