

# EFFECTS OF DANCE-MOVEMENT THERAPY ON THE MOVEMENT AND SELF-CONCEPT OF WHEELCHAIR USERS WITH INTELLECTUAL DISABILITIES

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**Abstract:** *This study aimed to determine the effects of dance-movement therapy on individuals with mild intellectual disabilities, focusing on their self-concept and various general and wheelchair movement qualities. The sample included two females and three males with mild intellectual disabilities, ranging in age from 17 to 26 years. Two of the participants were diagnosed with cerebral palsy, while the other three were diagnosed with myelomeningocele. The participants had difficulties/disorders in various aspects of movement and used a wheelchair to move independently. They were included in a dance-movement therapy programme developed specifically for the present study, which incorporated various dance-movement therapy concepts such as Emerging Body Language (Rutten-Saris, 1992), Brain Dance (Gilbert, 2015), and the Dance Movement Therapy approach (Payne, 2006). The dance-movement therapy programme involved one-hour sessions that took place weekly over a four-year period. We used the Self-Concept Questionnaire (Musitu et al., 1998) through which social, familial, physical, learning, and emotional aspects of self-concept were assessed, as well as two scales assessing general and wheelchair movement quality (developed specifically for this study). The results indicate that, at the beginning of the dance-movement therapy programme, participants had below average social, familial, learning, and emotional aspects of self-concept, as well as above average physical self-concept and some difficulties with certain general and wheelchair movements. After attending the dance-movement therapy programme, participants showed improved performance and scored above average on most self-concept aspects. They also improved in all measured aspects of general movement quality and several aspects of wheelchair movement quality. Thus, the results suggest that the dance-movement therapy programme was effective for individuals with mild intellectual disabilities and movement difficulties in the areas of self-concept, as well as general and wheelchair movement.*

**Keywords:** *intellectual disabilities, dance-movement therapy, wheelchair, self-concept, movement*

## INTRODUCTION

Arts-based approaches as a form of professional support to individuals with disabilities may include various forms of art, such as music, dance, drama, and visual arts (Bradeško & Potočnik, 2022). Dance can be a unique nonverbal means of expression that allows individuals to express their experiences through movement (Dunphy & Scott, 2003). It includes rhythmic movement of the body, usually to music and within a given space, with the purpose of expressing an idea or emotion, releasing energy, or simply enjoying the movement itself (Britannica, n. d.). Dance allows us to see how intertwined different (internal) psy-

chological processes and (external) physical expressions are and how they interact (Serlin, 1993). For this reason, dance may be defined as a holistic mind-body process.

Dance has a dual effect: it simultaneously addresses the body and the mind (Ravelin et al., 2006). Thus, it can aid in discovering or changing one's self-concept (the image that an individual has of himself or herself) and enable the individual to experience wholeness. The identified characteristics and consequences of dance have shown that dance can promote an individual's self-reflection and interaction with others, as well as contribute to the individual's mental health (Ravelin

et al., 2006). Finally, dance can provide an acceptable way to relieve emotional and physical pressure. In cases where an individual has difficulties in communicating with others, dance can facilitate nonverbal communication by providing a clear structure for mutual interaction. Dance expression comes from the individual him/herself and may include rhythm. Rhythmic control and its relationship to movement outcomes have been of growing interest to neuroscientists over the past decade. Researchers at the Center for Biomedical Research and Music at the Colorado State University, USA, reported that musical rhythm stimuli are responsible for activating motor neurons in the brain that coordinate muscles to perform a motor task, as observed in dance-based therapy (Thaut, 2011, in Krampe, 2013).

We can conclude that studies on dance therapy and social dancing show some benefits for individuals in terms of their positive emotions, communication, and behaviour (Bengtsson et al., 1998). Dance may cause changes in the human mind by affecting physical functioning, thus promoting health and growth in an individual (Levy, 1992, in Ravelin et al., 2006).

### **Dance-movement therapy**

Dance-movement therapy (DMT) is an arts-based approach. It represents the integration of the physical and psychological processes of the individual, for whom dance and movement activities are basic elements to improve their competencies and skills (Tortora, 2019). Dance movements involve balance and coordination associated with the step-by-step control of goal-directed movements (Earhart, 2009).

DMT is primarily an approach that allows individuals to express their nonverbal, emotional experiences through sensory, emotion-rich dance and movement activities, which is in turn supported by the creative self-expression inherent in dance (Koch & Fischman, 2011; Levy, 2005). Such individual and/or group discoveries that occur in therapeutic sessions create a deeper self-awareness that can transform into verbalisation, cognitive understanding, and behaviour

change (Goodill, 2018). By engaging individuals in the DMT process and providing them with regular dance-movement activities, a holistic stimulation of various aspects of their activities is enabled, such as movement, mental, emotional, and social aspects (Kroflič, 1999).

For the DMT process to be effective, an individual participating in DMT and the therapist leading the DMT process must work together (Caf et al., 1997; Griss, 1998). By integrating movement into dance, the dance-movement therapist leads an individual toward nonverbal expression and directs his or her attention to the experience itself (Levy, 2005). It is therefore important that DMT takes place in a relaxed and playful environment that allows an individual to experience both safety and ‘artistic freedom’. The so-called ‘art creation’ (creative process) enables an individual to experience art through movement that is characteristic of DMT (Dunphy & Scott, 2003; Geršak, 2017; Kroflič, 1999). An accepting and engaging environment is a basic requirement for DMT programme participants to work and learn in a group setting (Bucik, 2012). In this way, all group members who complete the DMT programme become active co-creators of a (dynamic) environment that enables individual progress in interaction with others. This interpersonal activity is based on learning from actual experiences and creating new relationships, and is a ‘live experiment’ (Kivlighan & Holmes, 2004). When a dance partner is included in the DTM programme, there is a natural tendency to mirror his or her posture, gestures, and movements. The American Dance Therapy Association (ADTA, 2019) highlights the importance of DMT in therapeutic work with children of various ages, adolescents, and adults. DMT is commonly used to enhance the education and development of individuals with ID (Mullane & Dunphy, 2017).

### **DMT programme to promote self-concept and movement among individuals with intellectual disabilities**

The DMT programme can be used to improve various aspects of the functioning of individuals with intellectual disabilities (ID). Such individ-

uals typically exhibit reduced intellectual abilities, limited verbal and nonverbal communication skills, social and emotional problems, and movement difficulties. In addition, these individuals learn more slowly, require concrete examples, have difficulty concentrating, have short attention spans and poor learning strategies, and often have several accompanying and co-occurring disorders (Placement of Children with Special Needs Act - ZUOPP, 2011). In the population of individuals with ID, they were often found to have more than one disability (Alimović, 2017). In their meta-analytic study, Carmeli et al. (2005) found that individuals with ID develop low self-concepts with increasing age due to cultural isolation, social discrimination, and general neglect. The authors also reported that the self-concept of individuals with ID, similar to those without ID, is important for their daily functioning because it is associated with depression, anxiety, lack of motivation, or anger. Therefore, it is important to develop a positive self-concept in individuals with ID, which can be achieved through a dance-movement programme.

Because DMT can simultaneously address physical and behavioural aspects of functioning, it may contribute to improving weakness in motor skills and reduce maladaptive behaviour problems and attention deficits in individuals with ID (Takahashi & Kato, 2022). When planning activities for individuals with ID, their developmental characteristics must be considered (Bucik, 2012; Caf et al., 1997; Kroflič, 1999; Serneć, 2016; Tancig, 1994; Tortora, 2010a, Tarota, 2010b, 2010c). Recent research (e.g., Jurjević, 2018; Mino-Roy et al., 2022) focusing on working with individuals with ID emphasised the importance of including movement in the integrated approach. Individuals with ID find it more difficult to develop motor skills than individuals without ID, so it is important to promote the development of different motor skills, such as fine motor skills or balance and movement organisation (Lahtinen et al., 2007; Vuijk et al., 2010). Access to meaningful activities is limited for people with ID, although these can contribute to the development of their various characteristics (Mino-Roy et al., 2022).

Before starting DMT for individuals with ID, it is important to gain information about their abilities and skills (Behrends et al., 2012; Mendelsohn, 1999; Serneć, 2016; Sherborne, 1993; Willems, 2016; Woolhouse & Lai, 2014), which can be improved through long-term dance movement activities. Mokorel (2017) and Hoban (2000) investigated whether regular participation of individuals with mild ID in dance-movement activities has an impact on their self-concept and demonstrated a positive effect on the self-concept. Mokorel (2017) concluded that dance-movement activities provide a safe and stimulating environment for individuals with ID to interact with others and develop more independence and self-confidence. Hoban (2000) attributed much of the progress that individuals with ID made in terms of their self-concept to the co-participants ('movement assistants') in the research, who were involved in all dance movement activities (such as movement in space, dancing with a balloon, handling fabric together) and were actively involved in the movement interaction with the wheelchair users with ID.

Ruten-Saris (1992) emphasised the importance of incorporating imitation or mirroring exercises into the planning and implementation of the DMT programme for individuals with ID. The mirroring method is typically performed in pairs, and it helps improve participants' body awareness, as well as promote reciprocal interactions and empathy between participants (Koch et al., 2015). In addition, some authors (e.g., Corthouts & Goessens, 2016; Delaherche et al., 2015) have found that imitation skills improve when experts systematically promote them through various activities. Therefore, it is important for individuals with ID to learn to observe their own movements and the movement expressions of others, thus developing their movement memory by developing concrete ideas about their movement experiences and the movement experiences of others, which they can later use to execute new movement patterns (Kroflič, 1999).

Payne (1992) studied the effects of DMT on individuals with moderate ID. She found that DMT participants' dance-movement activities signifi-

cantly improved their awareness of the body and body parts, spatial orientation, and coordination, as well as increased their flexibility. The same author also found that DMT helped create 'group movement' and improved relationships between individuals with ID. They can use the DMT programme to express themselves through movement and learn to act constructively in a group, which is important for their further development of movement, interaction, and communication with others (Tortora, 2013). Regular performance of these activities can positively impact other aspects of the functioning of individuals with ID, such as cooperation, spatial awareness and orientation, independence, relaxation, physical release, and creativity (Kroflić, 1999).

Østern (2009) conducted a DMT programme with a group of eight individuals with ID (two of whom were wheelchair users) as a part of the Dance Laboratory project, which included a weekly dance workshop over a two-year period in collaboration with various amateur and professional dancers. She found that dance-movement activities focusing on contact improvisation and stage production positively affected various aspects of the functioning of individuals with ID. During the workshop on stage, there was an increase in social interaction and acceptance of others, as well as in the satisfaction expressed and in what she called 'shared dance dialogue', meaning imitating the movements of others, communicating with others, and performing dance elements.

DiPasquale and Kelberman (2020) investigated the feasibility of an integrative contemporary dance course to improve the physical functioning of 18 adults with ID. The individuals participated in a 12-week dance course with 11 university students. The dance course included one hour of dance training twice a week. The university students danced alongside the course participants and provided support when needed. The results showed that individuals had significant improvements in their lower extremity strength in all muscle groups, flexibility, mobility, and stability. These results suggest that integrative dance programmes provide physical improvements for individuals with ID.

Takahashi and Kato (2022) conducted a systematic review of research on DMT programmes for adult participants with ID between 1970 and 2021. Only five studies met the research requirements, since DMT is usually performed by dance movement therapists within their practical therapeutic work and not as a research tool. The authors reported the positive effects of DMT interventions in individuals with ID in all five included studies. Individuals who participated in the programme appeared to improve in several areas: motor skills, body awareness, emotional well-being, and muscle relaxation.

### **Research problem and hypotheses**

DMT enables participants' holistic stimulation of the various aspects of their functioning, including movement, emotional, and social ones (Kroflić, 1999). Some authors (e.g., Jurjević, 2018; Mino-Roy et al., 2022) have emphasised the importance of including movement in the integrated approach when working with individuals with ID, since it can contribute to specific developmental difficulties, such as movement difficulties, as well as communication, social, and emotional problems (e.g., Bucik, 2012; Kroflić, 1999; Lahtinen et al., 2007; Serbec, 2016; Tortora, 2010a, Vuijk et al., 2010). When planning the DMT programme for wheelchair users with ID, the activities must be adapted to their abilities and movements in the wheelchair (e.g., speed, selection of music with appropriate rhythm).

Although some authors (e.g., Bucik, 2012; Caf et al. 1997; Tortora, 20010a, 2010b, 2010c) emphasised the importance of DMT for individuals with ID, scientific studies on DMT are limited because dance-movement therapists use these tools for practical therapeutic work and not as a research tool (Takahashi & Kato, 2022). However, few studies (e.g., Mokorel, 2017; Østern, 2009; Payne, 1992) have implemented a DMT programme and attempted to determine the effects of DMT for individuals with ID on specific areas of their functioning. These studies demonstrated the positive effects of dance-movement activities on the self-concept, social interaction, communication, spatial orientation, imitation of others'

movements, and specific movement qualities (e.g., coordination and flexibility) of individuals with ID.

In this study, we aimed to determine whether the design of a long-term DMT programme (over four years) had a positive impact on all five measured aspects of self-concept (social, family, physical, learning, and emotional) as well as on the quality of general and wheelchair movement of individuals with ID. Consistent with this goal and based on the findings of previous studies (e.g., Mokorel, 2017; Payne, 1992; Østern (2009), we formulated the following hypotheses for individuals with ID:

H1: A comparison of participants' data collected before and after the DMT programme will show positive effects on all aspects of self-concept.

H2: A comparison of participants' data collected before and after the DMT programme will show positive effects on all general movement qualities.

H3: A comparison of participants' data collected before and after the DMT programme will show positive effects on all wheelchair movement qualities.

## METHODS

### Participants

The study focused on five individuals with ID (two women and three men) between the ages of 17 and 26 years. We obtained their medical records, which included information about their disabilities and reports describing their psychological characteristics. Two of the participants (one man and one woman) were diagnosed with cerebral palsy with the following characteristics: permanent movement and postural disturbances, difficulties in movement and motor control, and associated cognitive and visual impairments. Three participants (one man and two women) were diagnosed with myelomeningocele (also known as open spina bifida): a congenital defect in which the individual's spine and spinal canal do not close before birth. This congenital condition manifests in movement and sensory perception difficulties (touch), learning difficulties, and emo-

tional problems (difficulty adjusting to new situations and decreased problem-solving ability). All five participants had mild ID, including significantly reduced intellectual abilities and adaptive skills (e.g., independence, social skills, practical skills), as well as moderate speech and language impairments (reduced language comprehension skills and difficulty understanding speech). The records of two of the participants (one with cerebral palsy and one with myelomeningocele) showed no evidence of negative self-concept, whereas the records of one participant with cerebral palsy and two with myelomeningocele showed some lower self-concept characteristics. All individuals with ID who participated in the study used a wheelchair to move independently for short distances.

Prior to the DMT programme, none of the participants had experience with dance-movement activities or performing movement on stage (hereafter stage performance). Each individual with ID who participated in the present study was assigned a dance partner (assistant) for the duration of DMT who supported him or her in the movements.

### Measurement instruments

For the purpose of this study, we used a self-concept questionnaire, an observation scale to determine general movement quality, and an observation scale for wheelchair movement, as described below.

### Self-Concept Questionnaire

The Self-Concept Questionnaire (SCQ; Musitu et al., 1998) is based on the Shavelson model of self-concept. The questionnaire helps us to determine the social, familial, physical, learning, and emotional self-concept. The Slovenian-language questionnaire consists of 44 questions and participants rated these questions on a scale from one to three (1 - always, 2 - sometimes, 3 - never) to describe how often certain statements applied to them. There were 11 items describing social self-concept, 9 items describing familial self-concept, 9 emotional self-concepts, 8 items describing learning self-concept, and 7 items describing physical self-concept.

The study participants self-rated the SCQ questionnaire individually. The results were interpreted based on norms obtained from Slovenian adolescents aged 11 to 19 years, as well as those included in the manual (Musitu et al., 1998). The mean score for social self-concept was 28.27, familial self-concept was 21.59, physical self-concept was 15.69, learning self-concept was 17.45, and emotional self-concept was 18.61. These norms for interpreting the results were established for individuals without ID, but were also used for the participants in the present study, because we assume that individuals with ID do not assess their self-concept differently from those without ID.

### General Movement Quality Scale

The first author of the present study developed the General Movement Quality Observation Scale (GMQS, unpublished) based on the existing Movement Observation Scale (Owen, 1999). The GMQS consists of the following 16 elements (represented by one item each) that are observed in an individual: (1) symmetry of movement (smooth movement from left to right), (2) smooth and fluid upper body movement, (3) dynamic contrast experience (the ability to differentiate between conflicting movements: fast/slow, sharp/soft), (4) variability in the use of movement patterns and body posture (use of different/new movement patterns and dance positions when dancing with a partner), (5) space perception or 'kinesphere' (awareness of the space in which specific dance movements are performed and active use of all space available for these movements), (6) movement mirroring dynamics (ability to follow the direction and speed of movement of the dance partner or group), (7) orientation in a known space, (8) movement synchronicity with other group members, (9) rhythmic movement, (10) variety of movements in relation to posture (different types of hand position and dance position with dance partner), (11) establishing eye contact with dance partners and/or group members, (12) maintaining eye contact with dance partner and/or group members, (13) relationship with the dance partner (initiating 'dance dialogue' and trusting the leading of

the dance partner), (14) initiative (initiating dance, leading and controlling movement between dance partners and/or in the group), (15) expressiveness (ability to express one's emotions), and (16) enjoyment while dancing (expressing pleasure/satisfaction/enjoyment while dancing/moving). Each element was scored on a 5-point scale (1 - poor, 2 - acceptable, 3 - good, 4 - very good, 5 - excellent) to assess the individual's movement quality.

The observation scale was used at the beginning (in the first session) and at the end (in the last session) of the DMT programme. The evaluation of movement quality was performed by analysing the video recordings taken in the first and last DMT session.

### Wheelchair Movement Quality Scale

Based on the existing Movement Observation Scale (Owen, 1999), the first author of the present study developed a Wheelchair Movement Quality Scale (WMQS, unpublished), which consists of 12 elements (represented by one item each). We assessed 12 elements of wheelchair movements: (1) ability to use a wheelchair, (2) smoothness in the use of a wheelchair (fluent handling of the wheelchair in a given space), (3) speed of wheelchair movement (mastery of fast movements in the wheelchair), (4) wheelchair movement orientation, (5) forwards/backwards movement with the wheelchair, (6) fast/slow movement with the wheelchair, (7) straight/curved movement with the wheelchair, (8) half-turn in the wheelchair (half-turn in the wheelchair to the left and right), (9) full turn in the wheelchair (full turn in the wheelchair to the left and right), (10) starting and stopping wheelchair movement following verbal instruction, (11) rhythmic wheelchair movement, and (12) 'pause' in the movement with the wheelchair (controlling the wheelchair in a static position). For each item, an observer rates the wheelchair movement quality of the participant on a 6-point scale (1 - cannot perform a movement even with assistance, 2 - needs assistance to start and continue the movement, 3 - needs assistance to start the movement, but performs it alone throughout the movement, 4 - starts the movement alone, but needs demonstration, 5 - starts the movement

alone based on verbal instructions or/and assistance, 6 - starts the movement spontaneously).

The observation scale was used before and after the DMT programme. We assessed wheelchair movement by analysing the video recordings taken in the initial (analysis of video recordings of the first DMT session) and in the final phase of DMT (analysis of video recordings of the last DMT session).

### **Concept of the DMT programme for wheelchair users with ID**

The DMT programme took place within the therapeutic activities of CIRIUS Vipava, a centre for the holistic treatment of children and adolescents with various developmental disabilities. The author of the programme is the first author of the present study and is currently employed at CIRIUS Vipava.

The goal of the DMT programme was to promote general movement quality, specific wheelchair movement quality, various aspects of self-concept, and the ability to take part in stage performance. Considering general movement qualities, the programme focused on various movement elements, for example, symmetry of movement, smooth and fluid movement, variability in the use of movement patterns and body posture, spatial awareness, and so on. When specific elements of wheelchair movement qualities were considered, the programme focused on the ability to use a wheelchair, smoothness in using a wheelchair, speed of wheelchair movement, orientation in wheelchair movement, rhythmic wheelchair movement, and so on.

To promote a positive self-concept in individuals with ID, the researcher who created the programme repeatedly praised the successful and active performance of individual dance and movement activities and the exploration of new movement forms and dynamics, as well as cooperation with others (following instructions, acceptance of the group). Various aspects of self-concept were also promoted through stage performances held in front of large audiences that included the parents or guardians of participants with ID, who also

gave them positive feedback on their dance movement skills. Another way to promote a positive self-concept was to learn through specific personal experiences, such as by successfully overcoming certain conflict situations that the participants faced during the programme or dealing with some emotions that arose when interacting with others.

The movement limitations of wheelchair users with ID required that all activities and types of movement (e.g., speed, rhythm) were adapted to their abilities to move with the wheelchair. We also needed to find a suitable venue for the DMT programme: a gym large enough for participants to move freely and safely, with a smooth floor and no edges or obstacles.

The DMT programme conducted with wheelchair users with ID included a detailed design and structure for each session that incorporated various DMT concepts such as Emerging Body Language (Rutten-Saris, 1992), Brain Dance (Gilbert, 2015) and the Dance Movement Therapy approach (Payne, 2006). Emerging Body Language (Rutten-Saris, 1992) is a dynamic approach to help and support participants to interact with others. In our programme, the development of interaction was based on an active exchange process between individual(s) and the therapist that included their simultaneous, reciprocal, and equal interaction. Interaction included interpersonal experience with 'shared meanings', which were seen as key determinants of art therapy effectiveness and key tools for therapeutic change. The Brain Dance concept includes a set of eight developmental movement patterns that children perform naturally in the first years of life (Gilbert, 2015). Based on Brain Dance, we integrated four basic elements of creative dance (body, space, time, force/dynamics) and fifteen dance concepts (body: parts, shapes, relationships, balance; space: place, size, plane, direction, path, focus; time: speed, rhythm, duration; force/dynamics: energy, weight, flow) into our programme. DMT is an arts-based approach (Payne, 2006) and we included this concept into our programme through the integration of movement and dance to harness the creativity of individuals and their process of emotional, cognitive, physical, and social integra-

tion. During the process of designing each activity, the creator of the programme took inspiration from the content of the specialised study of Art Therapy, which she completed at the Faculty of Education, University of Ljubljana.

Each weekly session lasted for 60 minutes. There was a structured work plan for each session, but it was also flexible and responsive to group dynamics and the situation at hand. The work plan included a structure of the session, forms of work, use of space, accessories, and musical background. Each individual session consisted of (1) an introduction (activities to set the mood and make initial contact with the participants), (2) a warm-up (activities to promote body awareness, explore the space, and become accustomed to the content of the session), (3) a thematic part (selection of dance movement activities to promote general movement and wheelchair movement), and (4) a closing session (calming and welcoming activity). The use of space was arranged in a circle or in a row, occupying the space individually at certain points. When performing dance movements, the use of various tools was planned, such as a large ball, a small ball, a scarf, a ribbon, a ring, or similar items. For each meeting, the creator of the programme selected one or more musical backgrounds in advance to promote rhythm and create a more pleasant atmosphere while conducting the DMT.

The DMT was planned and implemented in such a way that, since the beginning of the programme, the goals/activities addressed the following areas: (1) getting to know and become aware of the body (e.g., individual movement activities, mirroring the movements of another group member); (2) discovering space (e.g., getting to know different patterns of movement in space, discovering different ways of getting around in a wheelchair); (3) orientation in space (e.g., trying out different directions of movement, speeds of movement); (4) learning the basics of dance technique in the wheelchair (e.g., getting to know different qualities of movement in the wheelchair); (5) learning the dance technique in pairs (e.g., movement forms in space and learning dance contents); (6) learning the dance technique

in a whole group (e.g., following the movement, leading the other); (7) learning movement in space (e.g., importance of harmonious individual movement in the whole group); (8) movement improvisation (e.g., movement dialogue, mirroring); (9) joint movement design, and development of new movement patterns on a musical and rhythmic basis; (10) preparation and learning of dance choreographies; and (11) preparation and performance of stage presentations. These specific areas were combined during the sessions chronologically, usually with one or two central themes in each session. In each session, participants also learnt to relate to others and work with different group members, solve problems, take on specific group roles, and take responsibility for discovering new movement content.

During the four years of the DMT programme, we had five stage performances in the first year, eight stage performances in the second and third years, and ten stage performances in the final year of the programme: a total of 31 stage performances.

## Procedure

Initially, the director of CIRIUS Vipava gave her approval for the implementation of the DMT programme as part of the therapeutic activities in the institution, as well as for research studies involving individuals with ID within the institution. Before conducting the present study, we asked individuals with ID (children) and their parents/guardians to participate in the study. Participation of individuals with ID was based on the informed consent signed by the parents/guardians and the individuals with ID themselves, and participation was confidential and voluntary. We explained to the individuals with ID and their parents/guardians that we would record and evaluate the first and last sessions of the DMT programme for the purpose of the study. We informed them that the individuals with ID would complete a questionnaire describing how they 'see themselves' (self-concept questionnaire) with the help of the first author of the present study. The parents/guardians of the individuals with ID were also asked for their consent to obtain information about the participants' diagnosis, a description of



their problems (from their medical records), and their psychological characteristics (from the psychological report). After obtaining consent, we reviewed the participants' medical records and psychological reports. Before starting DMT, we also assessed the self-concept of all five individuals with ID. We then started the DMT programme and recorded the first session. We used two measurement scales to assess movement quality and wheelchair movements, which were captured on the video recordings.

On the last day of the DMT programme, we recorded the dance-movement activities of the individuals with ID and used the same measurement tools (as on the first day of the DMT programme) to individually assess their movement quality and movement in the wheelchair. On the last day of the DMT programme, we also assessed their self-concept (using the same questionnaire used at the beginning of the programme). The DMT programme sessions took place over a four-year period in weekly sessions of 60 minutes from September to June. There were 31 sessions in the first

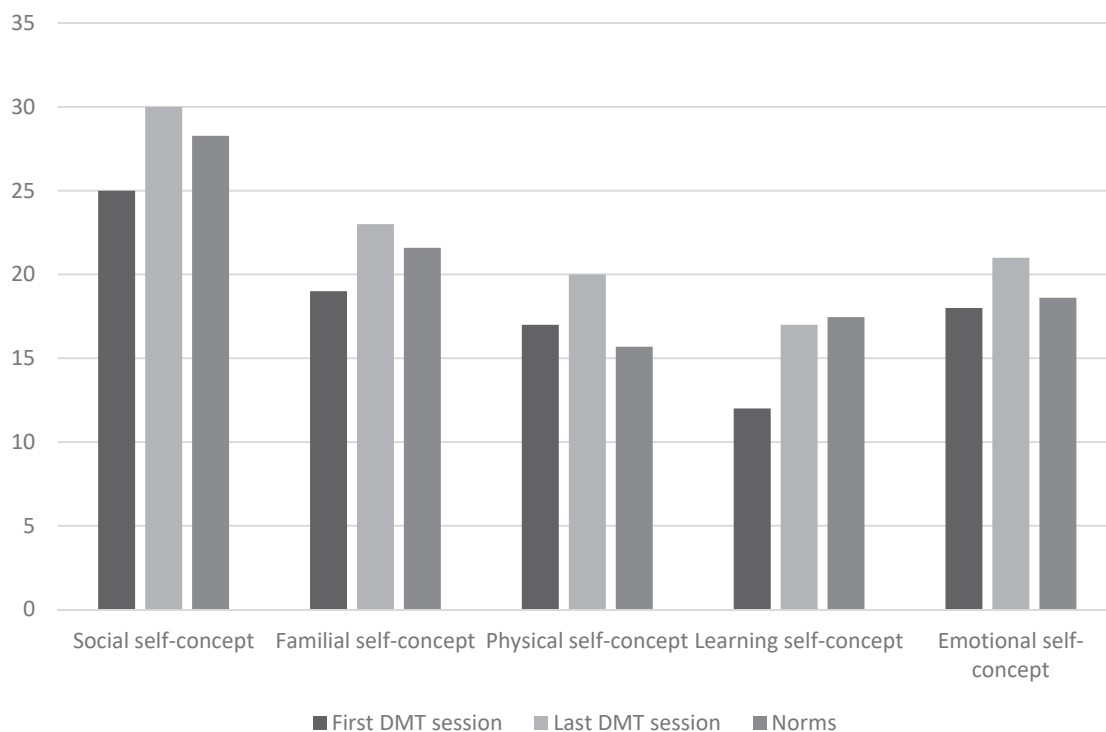
year, 34 in the second year, 32 in the third year, and 35 in the fourth year: a total of 132 sessions.

## RESULTS AND DISCUSSION

The results of the DMT programme are presented in three parts: self-concept, different types of movement qualities, and different types of wheelchair movement qualities for all five participants with ID.

### Self-concept

In this study, we compared the self-concept of individuals with ID before starting and after completing the DMT programme. As mentioned earlier, participants self-assessed the questionnaire on self-concept. Figure 1 shows the mean scores (for all five participants with ID) for all five aspects of self-concept that were the subject of the present study. Norms for adolescents without ID have also been added since they allow for easier comparison of results obtained with respect to the participants in this study.



**Figure 1.** *Self-concept of participants before and after the DMT programme*

Prior to participation in the DMT programme, each aspect of the participants' self-concept (social, familial, learning, and emotional) was below average, except for the physical aspect, for which the self-concept was above average (interpretation was based on norms). The results show that, on average, participants estimated that they had difficulty establishing and maintaining relationships (social self-concept), did not feel included in family dynamics (familial self-concept), had difficulty learning (learning self-concept), and could not control their emotions (emotional self-concept). Previous studies have also concluded that individuals with ID have low general self-concept, as well as low emotional and social self-concepts (Hoban, 2000; Mokorel, 2017).

Contrary to our expectations, participants were, on average, very satisfied with their physical appearance (physical self-concept), although they had difficulties with posture and body movement and were wheelchair users. There are at least two possible explanations for these unexpected results regarding their physical self-concept: they might have accepted the fact that their bodies have some limitations, or they did not fully understand the statements and/or questions in the questionnaire regarding their physical self-concept, since they were relatively complex and therefore more difficult to understand.

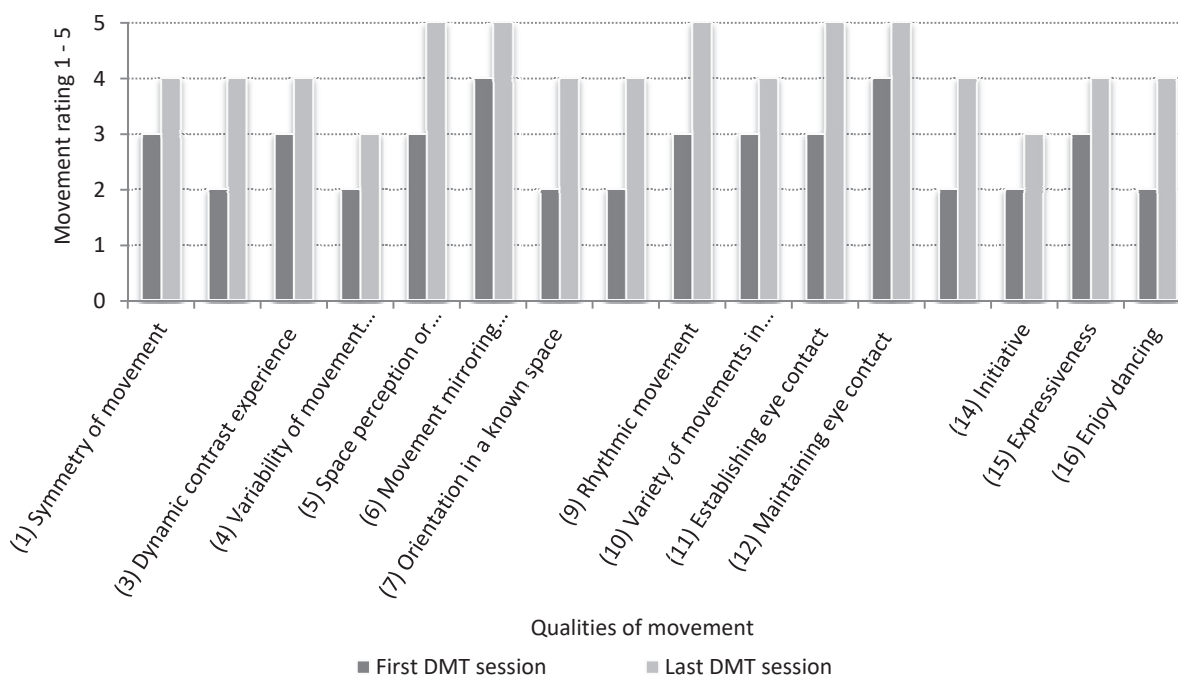
A comparison of the results before and after the DMT programme showed positive effects on all aspects of self-concept, confirming our first hypothesis (H1). Participants improved all their self-concept scores (above average) after completing the DMT programme, except for the learning aspect of self-concept for which scores were near average. Based on these results, we can assume that the four-year DMT programme positively impacted participants' self-concept aspects (social, family, physical, emotional) compared to norms for adolescents without ID, or were comparable to them (learning self-concept). One of the reasons for this is that the participants of our study were in a positively stimulating environment in which they performed the dance-movement activities. Informal observations of the participants by the programme implementers during

their dance and movement activities indicated that they felt very comfortable during most of the activities and that the positive feedback from the audience during their performances contributed significantly to their self-confidence. Through the DMT programme, participants successfully established and maintained relationships with other group members and safely explored new movement opportunities, which positively impacted their overall self-concept. This is consistent with the findings of other authors (e.g., Hoban, 2000; Østern, 2009), who emphasised the importance of a stimulating environment for DMT activities with respect to improving various aspects of an individual's self-concept.

### **General movement quality assessment of individuals with ID**

In this study, we were also interested in the general quality of movements of individuals with ID, which was rated on a scale from 1 to 5. We assessed 16 elements: symmetry of movement, smooth and fluid upper body movement, dynamic contrast experience, variability in the use of movement patterns and body posture, space perception or 'kinesphere', movement mirroring dynamics, orientation in a known space, movement synchronicity with other group members, rhythmic movement, variety of movements in relation to posture, establishing eye contact with dance partners and/or group members, maintaining eye contact with dance partner and/or group members, relationship with dance partner, initiative between dance partners and/or in the group, expressiveness of emotions, and enjoyment while dancing.

The results of each movement quality based on video recordings taken on the first and last day of the DMT programme (after four years of this programme) are shown in Figure 2.



**Figure 2.** Movement qualities of individuals with ID on the first and last day of the DMT programme

The results of the first assessment show that participants had an average score (2 - acceptable) on the following aspects of general movement qualities: smooth and fluid upper body movement, variability in the use of movement patterns and body posture, orientation in a known space, movement synchronicity with other group members, relationship with the dance partner, initiative, and enjoyment while dancing. This suggests that participants had the most difficulties with the smooth, flowing movement of individual body parts, as well as with continuous movement in space. Since this was the first time that participants had participated in such a programme, poor results were to be expected.

Average results (3 - good) were obtained by the participants in the following aspects of movement quality: symmetry of movement, dynamic contrast experience, space perception or 'kinesphere', rhythmic movement, variability in the use of movement patterns and posture, variety of movements in relation to posture, establishing eye contact with dance partners and/or group members and expressiveness. The results show that

the participants had developed their movement skills to a certain extent before participating in the DMT programme, which enabled them to express themselves with dance movements, such as symmetrical and rhythmic movement in space, adding different dance-movement patterns, and making eye contact.

The participants scored the best grades (4 - very good) in two of the assessed aspects: movement mirroring dynamics and maintaining eye contact: this indicates that these qualities were already well developed, but could still be improved further.

The comparison between the first and the last session shows that, on average, the participants made progress in all the movement qualities assessed, since they achieved higher scores in the last DMT session. These results (progress in all the assessed general movement qualities) confirm our second hypothesis (H2). According to the results of the last session, only two movement qualities (i.e., variability in the use of movement (patterns and posture) and initiative) had average values (3 - good) and indicated good movement qualities.

All other movement qualities measured were rated 4 (very good movement quality) or even 5 (excellent movement quality). These results suggest that consistent involvement of wheelchair users with ID in a carefully planned DMT can promote progress in several areas of movement quality, including those that were less developed before the individuals were involved in a DMT programme.

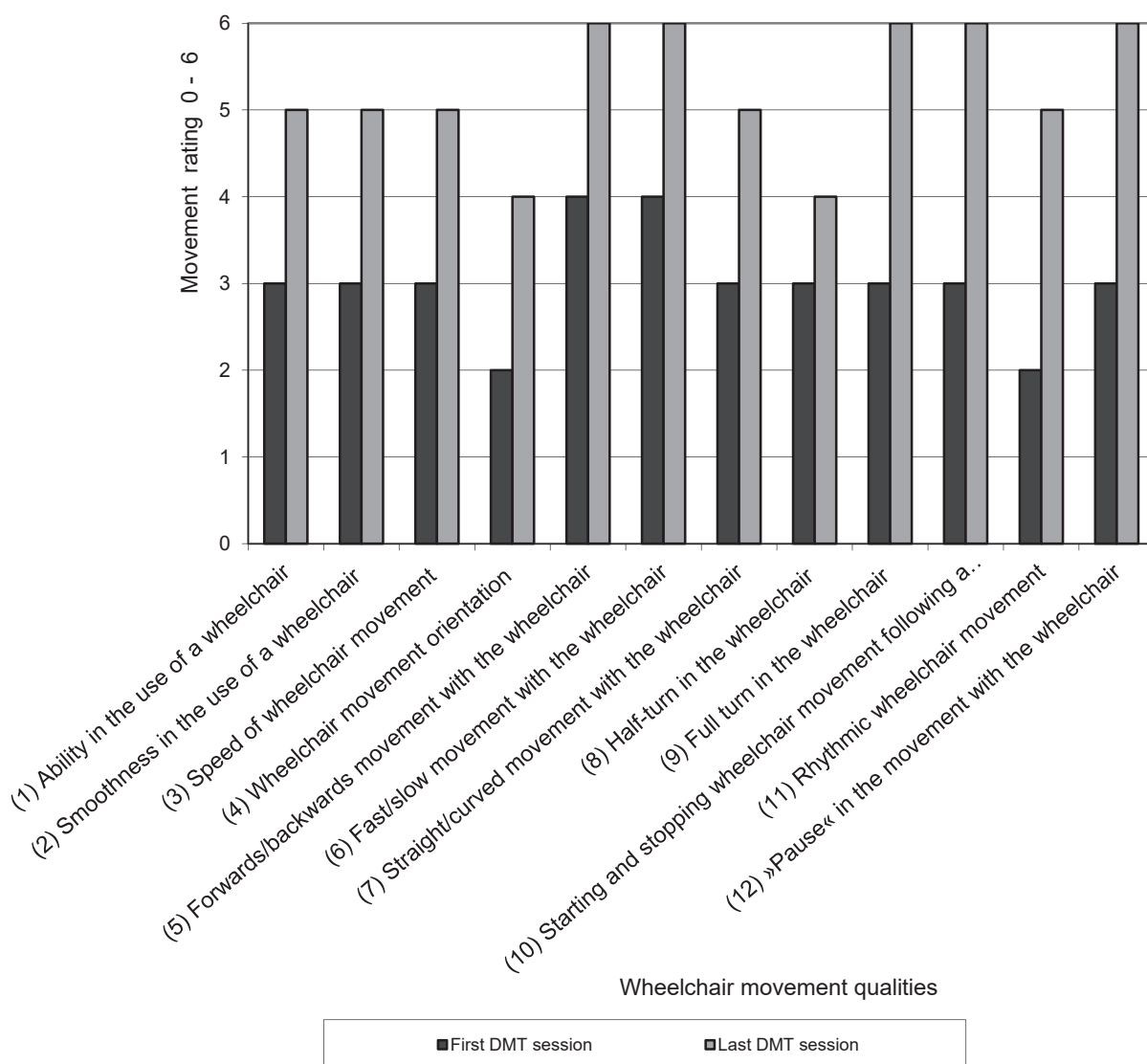
Our results are consistent with the findings of other authors (Østern, 2009; Payne, 2006; Ser-nec, 2016) and suggest that the participation of individuals with ID in DMT programmes can improve various movement skills and abilities, such as body awareness, mirroring, spatial awareness, variability of movement patterns, and coordination and interaction within a group. Improvement in these movement qualities is most likely due to the consistent repetition of movement patterns over the course of the four-year DMT programme, which is consistent with the findings of other experts who have attempted to determine the positive effects of various dance-movement programmes on movement quality (Benjamin, 2013; Dunphy & Scott, 2003; Payne, 2006). The DMT programme for individuals with ID included methods of copying, mirroring, and following the dance partner's movements, all of which have been recommended as highly effective by other experts in the field (Koch et al., 2015; Rutten-Saris, 1992): this could be one of the reasons why this DMT programme produced such good results for our group of five participants with ID. The progress that wheelchair users with ID made in various aspects of movement can be attributed to their motivation to participate in the DMT programme, which was conducted in a group with dance partners who helped these individuals with their movements and dancing. As mentioned earlier, participants noticeably expressed joy in the execution of their dance movements.

### **Wheelchair movement qualities assessment**

To obtain deeper insights into the quality of movement of individuals with ID, we conducted a wheelchair movement assessment in addition to the general movement assessment. Information about how the users handle the wheelchairs can provide additional findings about their movement abilities and skills, which are important for their daily life and inform us about their abilities when participating in the stage productions of the DMT programme. Wheelchair movements were rated on a scale from 1 (cannot perform a movement even with assistance) to 6 (begins movement spontaneously).

We assessed the following aspects of wheelchair movements: ability to use a wheelchair, smoothness in the use of a wheelchair, speed of wheelchair movement, wheelchair movement orientation, forwards/backwards movement with the wheelchair, fast/slow movement with the wheelchair, straight/curved movement with the wheelchair, half-turn in the wheelchair, full turn in the wheelchair, starting and stopping wheelchair movement, rhythmic wheelchair movement, and *»pause« in the movement with the wheelchair.*

Wheelchair movement was assessed using the video recording of the first session of the DMT programme and then again, four years later, after the last session of the DMT programme. The results of the assessments are shown in Figure 3.



**Figure 3.** Wheelchair movement qualities of wheelchair users with ID in the first and last session of the DMT programme

The initial assessment of wheelchair movement showed that participants had the most difficulties with wheelchair movement orientation and rhythmic wheelchair movement (2 - requires help to start and continue movement). Presumably, the poor results in this aspect of the movement were due to lack of experience, since the participants had not worked on developing their wheelchair skills prior to the DMT programme.

In almost all aspects of wheelchair movement at the beginning of the DMT, participants had average scores (3 - they needed help to start the movement, but continued independently throughout the movement) with respect to ability, smoothness, and speed of wheelchair movement, as well as control of wheelchair movement (straight/curved, half-turns and full turns, starting and stopping, and 'pause'). Participants had already developed these skills in everyday life before participating in the DMT programme.

At the beginning of the DMT programme, the participants had the highest scores with respect to two aspects of movement with the wheelchair (4 - begins movement independently but must be demonstrated): forward/backward and fast/slow movements. Higher scores in these two aspects reflect the wheelchair users' existing skills developed by moving from place to place in their daily lives. The results of the initial wheelchair movement assessment indicates that participants had already developed certain skills for independent wheelchair use and control, but were able to improve them further through the DMT programme.

During the DMT programme, all participants had, on average, improved their skills in all aspects of wheelchair movement. These results confirm our third hypothesis (H3). The results of the analysis of the last session show an average grade (4 - begins movement independently, but needs to be demonstrated) in only two aspects: orientation and half-turn in a wheelchair. Above-average scores (5 - begins movement independently based on verbal instructions and support) were achieved by participants in the following five aspects: the ability to use a wheelchair, smoothness in the use of a wheelchair, speed of wheelchair movement, straight/curved movement with the wheelchair, and rhythmic wheelchair movement. Participants had the highest scores (6 - starts the movement spontaneously) in the following five aspects: forwards/backwards and slow/fast movement with the wheelchair, full turn in the wheelchair, starting and stopping wheelchair movement, and pausing in the movement with the wheelchair.

Based on our results, we can assume that consistent long-term (four years) involvement of wheelchair users with ID in systematic dance-movement activities contributed to their progress in various aspects of wheelchair movement, including aspects that were poorly developed before the DMT programme. Our results are consistent with previous findings (e.g., Goodwin et al., 2004; Østern, 2009; Payne, 2006) showing that the long-term involvement of individuals with ID in dance-movement activities improves their wheelchair movement skills. This improvement indicates that individuals with ID can control their

wheelchairs better, making their movements less dependent on the assistance of others and giving them more freedom of movement.

## CONCLUSION

This study aimed to determine the effect of a four-year DMT programme on wheelchair users with mild ID in relation to their self-concept, as well as various general and wheelchair movement qualities. The DMT approach consisted of regular (weekly) long-term (four years) dance-movement activities that included repetition of specific movement patterns based on imitation, mirroring, and replicating another person's movements. Participants were motivated to perform these activities (through regular encouragement and praise for their work and performance) and experienced satisfaction in performing the activities.

The results show that, before the DMT programme, participants' social, familial, learning, and emotional self-concept were below average (norms), whereas the physical aspect of their self-concept was above average (norms). The participants had difficulties with certain movement qualities (e.g., moving certain body parts smoothly and fluently and moving continuously in space with the wheelchair), as well as with independent movement in the wheelchair (e.g., orientation, starting and stopping movement). After the DMT programme, their self-concept, and their general and wheelchair movement improved: participants scored above average on all aspects of self-concept (except for the learning aspect, where they scored near average), they had high scores for all measured general movement qualities, and they became more independent in wheelchair movement (they started movements independently and only occasionally needed verbal instructions or demonstrations). Thus, through the DMT, we contributed to the individuals' quality of life, which includes, for example, subjective and objective factors of individual self-concept and general physical condition (Batković & Rozman, 2006). The inclusion of dance and physical activity can be a protective factor for the psychosocial health of individuals with ID in their ageing process (Carmel, 2005), therefore, it is important to pro-

mote this aspect when working with these individuals.

This study is one of the first to focus on a longitudinal examination of the effects of the DMT programme on individuals with ID. Because only five individuals participated in the study, the results cannot be generalised to the entire population of individuals with ID. Takahashi and Kato (2022) emphasised that studies involving individuals with ID tend to be subjective because the researcher may be a clinically oriented practitioner, the studies often cannot reach the required number of participants, and it is also difficult to design studies with control groups.

It is also possible that the improvement in self-concept and movement qualities (including

movement in a wheelchair) was not only due to the participation of individuals with ID in the programme, but also due to other factors that we were unable to control during the four-year period (e.g., the improvement in movement could also be due to the physical therapy that all the participants attended). Future research on this topic should consider the programme's impact throughout its course (e.g., after the first, second, third, and fourth years), not just at the programme's beginning and after its end. The evaluation of the impact of the programme should also include other aspects that present difficulties for individuals with ID, such as cognition and emotions.

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