Adapted-Dance Intervention for Subacute Rehabilitation Post-Stroke:

‘WHAT’ and ‘HOW’

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This qualitative embedded single-case study sought to describe a dance intervention designed for people in stroke rehabilitation. Recommendations from rehabilitation therapists, and the researcher-dance educator’s observations of the therapists’ work and of patient participation during the intervention were captured and analyzed, from design to implementation, through various techniques, including a validated descriptive checklist from the health field, namely the Template for Intervention Description and Replication (TIDieR). This methodology enabled us to describe what ‘adapted’ dance was in this context, in terms of content and pedagogy, and thus to better distinguish such an intervention from the psychotherapeutic models underlying dance therapy. Thirteen rehabilitation themes emerged from the data to inform the dance content (the ‘what’ of the intervention), while four pedagogical categories subdivided into modalities portrayed the ‘how’. These findings suggest a ‘more experientially based’ intervention distinct from ‘more functionally based’ therapies. This paper presents the perceived effectiveness/ineffectiveness of the pedagogical modalities from the researcher-dance educator’s perspective and highlights the contribution of somatic-sensitive pedagogy. It concludes with some limitations of the TIDieR, such as its weakness in providing detailed and nuanced movement descriptions, leading the authors to recommend the use of complementary audiovisual data that would likely facilitate knowledge transfer.

Keywords: adapted dance; dance intervention design; pedagogy; descriptive study; stroke rehabilitation

Introduction

Dance offers a multimodal intervention soliciting physical and cognitive abilities (Dhami et al. 2015). It involves emotions, sensory stimulation, motor coordination and social interaction (Kattenstroth et al. 2010), as well as perception, executive functions and memory (Foster 2013). Research to date suggests that this multimodal means of intervention can generate additional benefits in neurorehabilitation by inducing neuroplasticity (Dhami et al. 2015).

Dance thus appears to offer potential for stroke rehabilitation. ‘Stroke happens when blood stops flowing to any part of the brain, damaging brain cells’ (Heart and Stroke Foundation 2018, no page). Stroke can lead to physical, emotional, behavioural and social effects, as well as effects on perception, language and cognition (Government of Canada 2017). To optimize patient recovery potential, conventional stroke rehabilitation approaches seek to harness the brain’s ability to modify its structural and functional organization after a lesion by intervening early after the stroke. After an average hospital stay of 7 to 14 days in acute care (Richards et al. 2013), patients who have recovery potential but are unable to return home are transferred to a physical rehabilitation centre or a rehabilitation hospital for intensive functional rehabilitation adapted to their neurological deficits. This subacute rehabilitation phase of variable duration occurs in the first three months following stroke, when patients benefit most from being stimulated (Deroide et al. 2010).

To date, few studies have examined dance in stroke rehabilitation. Most of them have been conducted in the chronic phase (Berrol et al. 1997; Patterson et al. 2016; Hackney et al. 2012; Wolff et al. 2017), including studies on dance through virtual reality (Sampaio et al. 2016; Subramaniam and Bhatt 2016). Rare studies have been conducted in the subacute phase, including pilot studies (Demers et al. 2015; Govare et al. 2014).

Fortin (2018) observed a tendency among studies using dance as an intervention in the health field to provide only a shallow description of the content and pedagogy. This lack of detailed descriptions is lamented by researchers using either qualitative or quantitative methodology (Raw et al. 2012) and runs counter to a literature advocating for a better understanding of health interventions with an aim of replicability (Hoffmann and Walker 2015). Such literature stresses the importance of opening up the ‘black box’ so that the inner components or logic of an intervention can be examined (Scriven 1994). In that sense, more information has been shared in recent literature. Some researchers such as Hackney and Earhart (2010), Bräuninger (2014) and Demers et al (2015) have sought to describe the dance intervention by examining dance techniques and dance steps in greater detail, thus sharing more than the usual information about dance style, duration of dance sessions and basic information about the structural segments of the intervention (Fortin 2018). Yet detailed descriptions of interventions are needed for the development of new interventions that can draw on knowledge acquired in previous studies. We contend that thorough descriptions of content and pedagogy are essential to the development of dance practice, whether in stroke rehabilitation or other health-related contexts. The goal of this study was therefore to describe what the participants did in our dance intervention in the subacute phase of stroke (the ‘What’) and how their participation was guided and encouraged (the ‘How’).

Methods

This qualitative study consisted of an embedded single-case study, which involves subunits of analysis within the case unit (Yin 2003). In this specific case study, the case unit was the adaptation process of the dance group intervention and the subunits of analysis were the clinical and theoretical premises of the intervention, its content, and its pedagogy (including its perceived

pedagogical effectiveness/ineffectiveness). The process of designing a ten-week dance intervention mainly involved a focus group held with an intensive functional rehabilitation (IFR) multidisciplinary team, observation of their work, and adapted-dance introductory sessions to obtain their points of view on desirable content and pedagogy. The subjective assessment of the pedagogical effectiveness/ineffectiveness – from the researcher-dance educator’s point of view – involved using the TIDieR checklist (see the subsection “Intervention Description” for details concerning this data collection tool), critical incidents, and video recordings.

Participants and recruitment

Participants were stroke rehabilitation therapists from the rehabilitation hospital that hosted the research. They were part of the multidisciplinary team in neurology and able to communicate in either French or English. The focus group members were recruited via an internal email invitation and posters presenting an overview of the study. For the observation of the therapy sessions, the rehabilitation therapists (multidisciplinary team members) were first screened by the hospital’s professional neurological care coordinator according to the availability dates of the researcher-dance educator. For the adapted-dance introductory sessions, they were sent an electronic invitation proposing two dates. Participation in the focus group was not a prerequisite for participation in the observation sessions, nor in the adapted-dance introductory sessions. Participation in the project was voluntary. The study had received prior ethics approval from both the university and the hospital institution and all participants signed a consent form.

Data collection

A focus group was held with rehabilitation therapists at the beginning of the study (Figure 1, Time 1) in order to obtain information about what the targets of the dance intervention should be

and what factors (particularly safety-related) should be considered in the intervention design. The discussion was digitally recorded and transcribed, and the participants' names were replaced with a code. The researcher-dance educator then observed physiotherapy and occupational therapy sessions for two half days (Time 2) since these involve movement directly as dance does. Observational notes – including patient safety instructions – were recorded in the researcher-dance educator's journal. The researcher-dance educator then offered two adapted-dance introductory sessions of 60 minutes each to the rehabilitation therapists to again collect their points of view and fine-tune the intervention design (Time 3). Notes were taken in the research journal. Finally, before the beginning of the ten-week adapted-dance intervention, medical information about the six patients who were to take part in the group was collected from each patient's medical records (Time 4).

The Template for Intervention Description and Replication (TIDieR) Checklist (Hoffmann et al. 2014) was used as a data collection tool throughout the intervention, biweekly sessions over ten weeks (Time 5). We chose this 12-item checklist (see Intervention section) because it is well-known in the rehabilitation community and used in the health care field to describe interventions and ensure replicability. In the remainder of the article, we focus on the 'What' and 'How' items. An adaptation of the Critical Incident Technique (Flanagan 1954) was also used by the researcher-dance educator after each session to self-report incidents perceived as most and least effective, in the research journal. These self-reports consisted of a precise description of what was proposed, done and said by the researcher-dance educator in terms of pedagogy at a particular moment in the session, and why she perceived these incidents as effective or ineffective. These perceptions led to intervention adjustments and modifications, thus

corresponding to the TIDieR item ‘Modifications’. In order to increase reflexivity and enrich data collection at Time 5, all the sessions were recorded using four GoPro digital cameras.

Analysis

A separate preliminary analysis for purposes of detailing the intervention design and intervention pedagogy was performed on paper by the researcher-dance educator to identify potential groupings likely to form the bases of thematic coding trees, which were then submitted to research team members for validation. Regarding the intervention design, this preliminary analysis of the focus group transcript and the research journal entries following observation of both the therapy sessions and the adapted-dance introductory sessions led to identification of potential rehabilitation themes. Overarching thematic analysis was then performed using NVivo software to connect the rehabilitation themes to the dance content, and more precisely to specific dance movement tasks (data from TIDieR checklists). Regarding the intervention pedagogy, the preliminary analysis of the TIDieR checklists and the critical incidents led to identification of potential, effective and ineffective pedagogical modalities. Before pursuing the analysis further, all digital audiovisual recordings files were imported into Final Cut Pro software (version 10.4) to

be classified and to create multi-camera plans that would allow sessions to be viewed from all four camera angles simultaneously. Each critical incident was numbered by session, and the numbers were then added to the descriptive TIDieR checklists (in a dedicated column) along with corresponding time codes from the digital audiovisual recording files. Overarching thematic analysis was then performed using NVivo software to connect critical incident efficiency to pedagogical modalities.

Results

A total of 18 rehabilitation therapists (n=18) participated in the study. They were essentially physiotherapists (55.5%) and occupational therapists (38.9%), and 83% of them were female (for a ratio of 6 women to 1 man). Seventeen (n=17) responded to our invitation to participate in the focus group (see Table 1). Three (n=3) participated in two half-day observation sessions (1 physiotherapist/2 occupational therapists), while eleven (n=11) attended one of the two adapted-dance introductory sessions.

Table 1. Characteristics and distribution of rehabilitation therapists by data collection group

Rehabilitation therapists (RTH)	Discipline	Gender	Focus group	Observation sessions	Adapted-dance introductory sessions
RTH1	OT	Female	•	-	•
RTH2	OT	Male	•	-	•
RTH3	OT	Female	•	-	-
RTH4	OT	Female	-	•	-
RTH5	OT	Female	•	•	•
RTH6	OT	Female	•	-	-
RTH7	OT	Female	•	-	-
RTH8	PT	Female	•	-	-
RTH9	PT	Female	•	-	•
RTH10	PT	Female	•	-	•
RTH11	PT	Male	•	-	•
RTH12	PT	Female	•	•	•
RTH13	PT	Female	•	-	-
RTH14	PT	Female	•	-	•
RTH15	PT	Female	•	-	•
RTH16	PT	Female	•	-	-
RTH17	PT	Female	•	-	•
RTH18	PSY	Male	•	-	•
TOTAL			7	3	11

OT = occupational therapist

PT = physiotherapist

PSY = psychologist

Before presenting our results regarding the ‘What’ and ‘How’ of the intervention, a portrait will first be provided of the patients who took part in the intervention, information that was taken into account in the design process¹. The group consisted of six patients who had had an ischemic stroke within the previous four to 25 days (≤ 25). Mean patient age was 71.0 ± 9.9 years (range 59-86), and the group included an equal number of men and women. Half of the group had some social dance background. The cases were heterogeneous in terms of ambulatory capacity, post-stroke sequelae and other conditions. Three patients used a wheelchair for the whole intervention, and another patient for most of it. The main challenges for the group intervention were the patients’ difficulty (or initial inability) in standing, using both sides of their body, remaining attentive and, in some cases, understanding the given instructions. Other sequelae that were considered included sensory, perceptual, and mood disorders, as well as fatigue. Verbal expression was an issue for half of the group (one patient could barely speak a few words).

Intervention Description

The following description of the intervention follows the 12-item TIDieR checklist and user guide (Hoffmann et al. 2014):

1) Name: Adapted dance for subacute rehabilitation post-stroke; **2) Why:** i) To intensify rehabilitation in an enjoyable manner, given that studies report dance as a pleasant activity and as fostering adherence and motivation, and ii) to contribute to rehabilitation through a modality with demonstrated pertinent effects and offering strong potential for neurorehabilitation; **3)**

What/materials: Varied music selection (iPod with portable Bluetooth speaker), pieces of cloth placed under the feet to facilitate sliding movements on the floor (when in sitting position) and

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¹ In this article, the patients are not regarded as participants since data collection was based on the rehabilitation therapists’ recommendations and researcher-dance educator’s perceptions.

rehabilitation technical aids; **4) What/activities:** The intervention was added to the patients' intensive functional rehabilitation program. The adapted-dance sessions were based on rehabilitation practices and recommendations, as well as dance- and movement-based educational approaches. The movements varied from one session to the other, but continuity was assured. They could be performed either sitting in a wheelchair or chair, or standing up, and with or without a technical aid. The structure of the sessions included a welcoming routine with warm-up exercises (~16 min.), a rhythmic segment (~12 min.), a standing segment (~13 min.), a segment involving the upper extremities (~7 min.), and a stretching/relaxation segment within a closing routine (~7 min.); **5) Who provided:** A researcher-dance educator trained in both dance and somatic education, helped by a rehabilitation assistant from the hospital; **6) How:** The intervention commenced upon confirmation from four patients and other patients were added within ≤ 14 days (for a maximum of 6). Most of the adapted-dance activities were performed on chairs and in a circle formation, and the standing segment could also be adapted to a sitting position if needed; **7) Where:** A suitable multipurpose room in a rehabilitation hospital; **8) When and how much:** The intervention consisted of biweekly adapted-dance sessions of 55 minutes each, for up to 10 weeks² (maximum of 20 sessions, depending on when the patient was recruited), and targeted the median zone³ of the Borg Rating of Perceived Exertion (RPE) Scale (Borg 1982). No breaks were included as such, but the patients were encouraged to take them as needed; **9) Tailoring:** Recommendations from rehabilitation therapists (collected through a focus group, observation of therapy sessions and adapted-dance introductory sessions) provided the basis for the intervention design. **10) Modifications:** Pedagogical adjustments were made

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² The duration of the intervention was based on previous studies (Demers et al. 2015; Earhart 2013; Govare et al. 2014; Hackney and Earhart 2010).

³ This zone refers to a perceived effort between 'light' and 'somewhat hard' on the level exertion scale.

throughout the intervention and an extra session was added at the end of the study for a wind-up celebration; **11) How well (planned) – adherence:** Hospital staff helped the hospitalized patients get to the dance room, and a free taxi service was offered to the patients who wanted to continue participating after returning home before the ten-week intervention ended. One relative per patient was invited to take part in the sessions; **12) How well (actual) – adherence:** An attendance sheet was completed by the researcher-dance educator at each session. An adherence rate of 82.2% was observed among the patients (91%, if we exclude one patient whose adherence rate was only 38% possibly due to fatigue and lack of interest), and 27.8% among the relatives.

The next section provides a more detailed description of the dance content (the ‘What’) and pedagogical modalities (the ‘How’). Their perceived effectiveness or ineffectiveness (by the researcher-dance educator) led to continuous adjustments, as already mentioned in regard to the TIDieR item ‘Modifications’.

The ‘What’

Table 2 presents 13 rehabilitation themes that emerged from the analysis of the focus group transcript and the observational notes of the therapy sessions and adapted-dance introductory sessions. The design of the adapted-dance intervention was informed by these themes, listed in the left-hand column of the table. The dance content (e.g., trunk softening movements) and the specific dance movement tasks (e.g., inhale while raising arms/elbows) matching the rehabilitation themes (e.g., breathing) are respectively presented in the middle and right-hand columns. The following section provides a brief description of these 13 rehabilitation themes identified as important.

The theme of **anteriorization** was deemed important to promote straight positioning, often a challenge following stroke. Presumably familiar movements were intended to trigger **automatisms**. **Breathing** emerged as important since it requires trunk mobility, which is diminished in people with partial or total paralysis on one side of the body. Developing **balance** was relevant for all patients, whether or not they could get up. **Compensatory schemes** required strategies to counter overuse of the unaffected side. Working on **coordination** was pertinent, as it is affected by both physical impairments and cognitive disorders resulting from stroke.

Stimulating **expression** was also recommended, especially nonverbal, since verbal expression can cause anxiety in people who can barely speak. However, the use of voice was suggested for simple ‘tasks’, such as counting aloud or ‘sounding’ (making sounds), to contribute to aphasia rehabilitation. **Postural control** was important for maintaining and changing body position (seated/standing). As some patients had sensory deficits, **proprioception** was identified as another relevant theme, either to awaken the senses or increase body consciousness. **Spatial perception** was mostly linked to mobility and visual neglect issues (such as the inability to process and perceive stimuli on the left side). **Stimulation of the stroke-affected side** was of primary importance, as was **stimulation of both sides of the body** to foster movement symmetrization. Lastly, **walking** (including **preparatory movements for walking**) emerged as important as it is a major issue in patient mobility and autonomy.

Table 2. Content of adapted-dance intervention (informed by rehabilitation/the ‘WHAT’)

REHABILITATION THEMES (captured in study data and research journal)	DANCE CONTENT matching rehabilitation themes (captured in research journal and audiovisual recordings)	SPECIFIC DANCE MOVEMENT TASKS (captured in TIDieR checklists and audiovisual recordings)
1. Anteriorization	Anterior movements in sagittal plane. Moving torso forward via slight pelvic anteriorversion (pelvic tilt).	<i>Sitting palms face down above thighs, move both hands forward (floating hands) while leaning forward; then bring hands and torso back to neutral position (one movement per 2 beats).</i>
2. Automatism (to trigger)	Common acquired/evocative movements.	<i>Dance the twist with upper body; tap foot to the music.</i>
3. Breathing	Torso softening movements. Inspiratory/Expiratory movements.	<i>With hands on elbows (self-assisted movement), inhale while raising arms/elbows and lengthening spine; exhale while lowering arms/elbows and gently curving spine.</i>
4. Balance	Various weight transfers. Soft head movements in sitting position.	<i>Holding hands on your heart, make it ‘dance’ into space, bringing torso forward in half-circle, to switch from one side to the other while looking at someone in the circle.</i>
5. Compensatory schemes (to counter)	Protraction movements (to counter overuse of trapezius). External rotations/abductions (to counter proximal contractions).	<i>With both palms face down above thighs, move one hand forward to center of circle, then the other; draw one hand back after rotating it palm upward and gently closing fist while pulling it toward self; repeat with other palm.</i>
6. Coordination	Progressive sequenced movements soliciting upper and lower limbs, torso and head.	<i>While sitting, lift both heels to rhythm of music; lift both hands off thighs simultaneously; then lift eyebrows.</i>
7. Expression (nonverbal)	Structured improvisation fostering interactions and expressiveness.	<i>‘Offer’ a movement to someone by making your hands “talk”, then draw them back toward yourself before ‘offering’ another movement to someone else.</i>
(verbal)	Use of voice as rhythmic activity (to count beats). Use of sounds as rhythmic punctuation (e.g., ‘Hey!’).	<i>(In 4 beats) Clap thigh with one hand (count “1” out loud), clap heart (count “2”, “3”, “4”); then repeat, but replace number by expressive “hey” sound on count 3.</i>
8. Postural control	Axial lengthening. Torso movements in frontal, horizontal and sagittal planes (postural variations and position changes).	<i>(Sitting) Breathe in while lifting gaze, and move navel forward; breathe out while lowering gaze, and move navel backward; spread knees apart on inhale; bring them closer together on exhale. Gently rock torso forward and backward, then side to side.</i>
9. Proprioception	Sensory awakening through touch/self-contact.	<i>Rub thighs (proximal to distal), then let hands ‘float’ in air. With palms on ribcage, eyes closed, feel movement of your breath through your hands.</i>
10. Spatial perception	Directional movements and spatial intentions (frontal, horizontal, and sagittal planes).	<i>‘Catch stars in the sky’ by reaching upward, to sides, then downward.</i>
11. Stimulation of stroke-affected side of body	Self-assisted movements (bi-manual). Sliding movements (less gravitational resistance).*	<i>With thumb of functional hand in palm of non-functional hand/upper limb, hold this hand to support its movements; in bi-manual movement, slide both hands back and forth on one thigh, before sliding them over belly to switch sides.</i>
12. Stimulation of both sides (symmetry)	Use of both sides of body through homologous, ipsilateral and contralateral movements.	<i>With hands on thighs, slide one hand toward knee (back and forth); switch sides; both sides; alternate. (Again, can be done through self-assisted movements.)</i>
13. Walking (preparatory movements)	Ankle movements and knee-ankle alignments (no knee flexion). Various weight transfers.	<i>(Sitting/Standing) Lift one heel off ground, then other; (Standing) While shifting weight onto one foot, play with other foot’s heel position. (external rotation). (Sitting) Palms face down above thighs, move one hand forward, then other, before drawing back first hand, then second (buttocks weight transfers).</i>

* Self-assisted and sliding movements have been borrowed from rehabilitation practices.

The ‘How’

Four adapted-dance pedagogical categories subdivided into different modalities emerged from the analysis of the TIDieR checklists, critical incidents and audiovisual recordings. The first category, *group-inclusive*, was associated with inclusive and cohesive modalities (see Table 3), echoing the words of the rehabilitation therapists who, from the start, associated dance with ‘a group coherence and dynamic difficult to reproduce in other [therapy] groups’ (quote from the focus group).

The second category, *ludic-artistic*, encompassed ‘patterned dance movement’, and guided ‘improvisational’ and ‘musical’ modalities (see Table 4). This pedagogical category resonated with the perception expressed by most of the rehabilitation therapists that dance can bring something different to therapeutic work by using ‘more playful’ modalities, offering ‘another way of approaching movement’, and thus ‘doing rehabilitation work with less awareness of working’ (focus group).

The third category, *stroke-differentiated*, was divided into ‘movement-supportive’, ‘participation-facilitating’, and ‘functional-bridging’ modalities (see Table 5). These modalities supported and facilitated the stroke patients’ participation, offered individualized options whenever possible, and facilitated connections between the dance content and daily life movements. Most of all, they addressed some rehabilitation therapists’ concerns ‘as to the feasibility of a dance group intervention encompassing heterogeneous cases’ (focus group).

The fourth and last category, *somatic-sensitive*, included ‘verbal’, ‘visual’ and ‘haptic’ modalities (see Table 6). This category appeared to be closely linked to the researcher-dance

educator's training in somatic education⁴, which influenced her way of leading and interacting with the group. Some professionals told us they saw themselves as 'drilling' with the patients in their practice, focusing 'a lot on the precision of the movement' (focus group), a way of approaching movement that seemed more 'corrective' in its intent than the pedagogical approach advocated in somatic education. In the latter, there is no 'correction' as such, unless movements are potentially harmful, and importance is placed on the subtleties of verbal and nonverbal communication. Table 6 highlights the nuances of such a somatic-sensitive pedagogy.

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⁴ 'Somatic education can be defined as the educational field which examines the structure and function of the body as processes of lived experience, perception and consciousness' (Linden 1994, 1). Somatic education places great emphasis on the individual's movement experience and learning process in its pedagogy.

Table 3. Pedagogy of adapted-dance intervention (group-inclusive modalities/the ‘HOW’)

GROUP- INCLUSIVE	CRITICAL INCIDENT (CI) related to pedagogy (captured in research journal)	E/I	Why CI was perceived as EFFECTIVE (E) or INEFFECTIVE (I) (captured in research journal and audiovisual recordings)
Inclusive modalities			
Circular formation	Circular formation to include everyone.	E	<i>Fostered group dynamic; allowed dance educator and participants to see everyone.</i>
Relatives included	Inclusion of relatives in group dynamic.	E/I	<i>Simulated patients’ participation and allowed relatives to join them in an aesthetic activity. Relatives could help but it was important to inform them about their role within the dance sessions so they did not tend to correct the patients or put ‘performance’ pressure on them.</i>
Cohesive modality			
Close-ended group	Group consisted of same participants for duration of project.	E	<i>Contributed to strong sense of belonging; allowed dance educator to better adapt content to patients’ progress.</i>

Table 4. Pedagogy of adapted-dance intervention (ludic-artistic modalities/the ‘HOW’)

LUDIC-ARTISTIC	CRITICAL INCIDENT (CI) related to pedagogy <i>(captured in research journal)</i>	E/I	Why CI was perceived as EFFECTIVE (E) or INEFFECTIVE (I) <i>(captured in research journal and audiovisual recordings)</i>
Patterned dance movement modalities			
Playful-aesthetic movements	Use of creative and harmonious sequenced movement to transform functionally based movements into artistic and playful ones.	E	<i>Provided different movement experience from that of so-called functional movement; stimulated interest and motivation.</i>
Body percussion	Simple sequenced movements using synchronized self-body contact to generate sound and proprioception.	E	<i>Self-body sound-making fostered proprioceptive self-awareness. Collective movement attainment helped sustain attention and interest.</i>
Movement variety	Blend of new and recurrent sequenced movements (to build on and around).	E	<i>Variety stimulated interest when balance found between proposed recurrent/‘mastered’ movements and ‘new’ ones.</i>
Whole-body stimulation	Sequences involving whole person in movement – building on capacities and potentialities.	E	<i>Not focusing on problem allowed pleasant and motivating approach to movements.</i>
Guided improvisational modalities			
Mimicking	In a given context (e.g., rhythmic explorations), participants are invited to propose a spontaneous movement to be reproduced by group.	I	<i>Often generated redundant movements, stress and anxiety. Some participants were put off by such proposals. Overall, this modality offered poorer motor stimulation quality.</i>
Imagery-led improv. Keyword-led improv.	Use of simple imagery to stimulate expressive movement (make hands ‘speak’, make heart ‘dance’) or keywords (explore elbow movement).	E	<i>Made movements more personal, expressive and emotional, and possibly elicited unexpected movements (and ranges of motion), but some participants were uncomfortable with improvisation.</i>
Interactive improv.	Use group dynamic to induce participants to direct movements of their own to others (e.g., ‘offer’ a movement, reach out through hands and eye contact).	E	<i>Created a bond between participants through interactions; made them play and laugh; fostered spontaneity and expression.</i>
Spatial-rhythmic mirroring	(2 X 2) Sitting face to face, one participant leads while other mirrors movement made with hand(s), torso, or feet (alternate roles).	E/I	<i>Created a bond between participants, sometimes giving rise to creative explorations. Less intimidating in pairs than facing group, but movements could be repetitive and some participants were unaware of others’ limitations, which raised safety concerns (e.g., ranges of motion; close supervision was required).</i>
Musical modalities			
Musical preferences	Ask participants for any favorite music and songs for the music playlist.	E/I	<i>Fostered participation but sometimes inappropriate to context (in terms of rhythm or lyrics); had to be used sparingly/wisely.</i>
Poetic-evocative music	Use of music likely to support artistic movement qualities.	E	<i>Created soothing atmosphere that reduced stress and anxiety. Movements became more sensitive, more harmonious.</i>
Rhythmic flexibility	Music rhythms allow for both slowing down and speeding up the movement pace.	E	<i>Some music rhythms easier to ‘play with’ to facilitate movement learning and adjustment of difficulty level (easier with instrumental music).</i>
Rhythmic variety	Use of varied rhythms to either soothe or energize, and to support movement learning.	E	<i>Balanced efforts required (in terms of attention and energy); rhythm suitability facilitated movement learning. (Of the 55-min. sessions, distribution of perceived rhythm effectiveness: ~24/slow, ~19/mid- and ~12/up tempo).</i>
Music with and without lyrics	Use of instrumental titles (including instrumental versions of popular songs) and music with lyrics to support participation.	E/I	<i>Easier for participants to understand and follow verbal instructions with instrumental music. Popular songs sometimes triggered good memories and even collective singing, though lyrics possibly interfered with verbal instructions; had to be used sparingly. (Perceived effectiveness ratio of 1:3.5 (song lyrics to instrumentals).</i>

Table 5. Pedagogy of adapted-dance intervention (stroke-differentiated modalities/the ‘HOW’)

STROKE-DIFFERENTIATED	CRITICAL INCIDENT (CI) related to pedagogy <i>(captured in research journal)</i>	E/I	Why CI was perceived as EFFECTIVE (E) or INEFFECTIVE (I) <i>(captured in research journal and audiovisual recordings)</i>
Movement-supportive modalities			
Partner support	(Standing/pairs) Use of physical help/contact to support movement in standing steps and in ‘pas de deux’ inspired by social dance.	E	<i>Created complicity and emotional moments between spouses, patient/relative, patient/patient, patient/assistant. Physical contact was appreciated and helped increase safety of weight transfers.</i>
Prop support	Use of board resting on thighs to support rhythmic activities involving percussive hand sounds and stimulate handling/grasping movements.	E/I	<i>Supported sound-making by group and helped participants make fine motor movements (e.g., tapping and stroking board); impact movements with hands had to be avoided in some cases.</i>
• <i>Masonite boards</i> <i>(12 in. x 16 in.)</i>			
• <i>Pieces of cloth</i>	Sitting, use of pieces of cloth under foot/feet to facilitate sliding movements on floor.	E	<i>Helped participants move feet freely by counteracting grip of shoe soles on floor and mobilizing stroke-affected side.</i>
<i>*Any props requiring the use of both hands/arms or fine motor skills were virtually unusable.</i>			
Participation-facilitating modalities			
Options	Proposal of movement options (if you can, go with movement A, otherwise pick B or C...).	E/I	<i>Demonstrated/described options had to be spaced apart to avoid too much information in short time. In cognitive disorders, options may be hard to discriminate.</i>
Progression	Progression based on recurring movements to build up more complex sequences, one step at a time.	E	<i>Helped everyone to follow and master proposed movements; sense of progression stimulated interest.</i>
Repetition	Use of repetition to foster learning while adding qualitative instructions to refine repeated movements.	E	<i>Helped participants execute new movements properly. Sequences had to be balanced with occasional stimulations (nuances, variations) to retain participants’ interest.</i>
‘Side’ cueing	Reference to ‘sides’ rather than left and right.	E	<i>Guided participants in movement symmetrization (first one side, then other side) without confusion of left and right directives.</i>
Simplicity-accessibility	Use of simple and accessible movements that become more complex as sequences build up.	E/I	<i>If too complicated, movements became confusing, discouraging, and overly demanding in terms of attention. If too simple, participants less affected by stroke lost interest. A balance had to be found.</i>
Slowness-gentleness	Use of slow and gentle movements in general.	E	<i>Slowness facilitated understanding and execution of movements. Tonicity problems were incompatible with quick and tonic movements, which is why gentle movements were necessary.</i>
Sound-making	Counting beats aloud (e.g., 1-2-3-4) and making sounds (e.g., hey!) to clarify rhythms and foster use of voice in aphasics.	E	<i>Energized movements of less mobile participants, marked rhythm and fostered expression. In aphasia cases, starting at participant while counting or sounding facilitated sound reproduction.</i>
Strategic seating	Help participants choose place in circle according to their perceptual disorders (if applicable).	E	<i>A place to educator’s left or right rather than opposite facilitated participation and learning in some cases (perceptual disorders).</i>
Visualization	Imagining movements rather than making them (when too difficult or impossible to do).	I	<i>Imagining was too abstract in cognitive disorder cases and required too much attention (whether with open or closed eyes).</i>
Functional-bridging modality			
Functional-informative tie-ins	One-off comments establishing connections between dance movements and everyday functional movements (e.g., walking or fine motor skills).	E	<i>Helped participants understand how dance content can assist in daily life rehabilitation challenges, in turn stimulating interest.</i>

Table 6. Pedagogy of adapted-dance intervention (somatic-sensitive modalities/the ‘HOW’)

SOMATIC-SENSITIVE	CRITICAL INCIDENT (CI) related to pedagogy	E/I	Why CI was perceived as EFFECTIVE (E) or INEFFECTIVE (I)
Verbal modalities			
Indirect ‘correction’	Instruction intended to ‘correct’ one participant’s inappropriate movement execution, but addressed to whole group so as to correct the person indirectly.	E	<i>Intended for participant concerned while remaining inclusive, so those experiencing more difficulty did not feel more ‘corrected’ than others.</i>
Proprioceptive guidance	Instruction bringing attention to moving body part to foster self-awareness. (What do you sense?/What’s going on while you move?)	E/I	<i>Drew attention to target area and helped participants figure out movements’ relevance (e.g., back lengthening = posture), but it possibly sounded ‘abstract’ and uninteresting for some. However, it worked for simple/short breathing activities (used gradually over the sessions).</i>
Self-adaptive guidance	Instruction inviting participants to move as they can, to feel free to tweak/adapt the movements if needed.	E	<i>Fostered movement appropriation and allowed everyone to participate in their own way.</i>
Self-regulating guidance	Instruction inviting participants to take care of themselves, set their own pace (e.g., by doing less).	E	<i>Fostered self-regulation; allowed everyone to adjust participation to their emotional state, level of fatigue, and endurance capacity.</i>
Visual modalities (that may be reinforced by verbal cues)			
Approval cues	Visual contact confirming that what one participant is doing is good/all right. (<i>Yes! That’s it! Bravo!</i>)	E	<i>Allowed more positive feedback to be given to everyone while facilitating dance movements; stimulated participation.</i>
Incentive gaze	Visual contact with a smile to stimulate and sustain participation (<i>Stay with me</i>), and engage participant to keep moving even when struggling with a movement. (<i>It’s confusing! Let’s do it together, you can do it!</i>)	E	<i>Helped participants stay engaged when their attention was dwindling or they were about to give up on a movement; like one-on-one supervision, but ‘at a distance’ in group circle. To be used after trying indirect correction instructions.</i>
Interrogative gaze	Interrogative visual contact to check if everything is fine for one participant. (<i>Are you okay?</i>)	E	<i>Allowed participants to express any needs experienced during dance sessions (need for rest, guidance, clearer instructions, or assistance).</i>
‘Lifting’ gaze	Visual contact (+ raised eyebrows and lengthened spine) requiring participants to lift their gaze to counteract postural sagging. (<i>Grow with me!</i>)	E	<i>Induced participants to look dance educator in the eyes and mirror spine lengthening movement (good for posture), without verbal instruction.</i>
Acknowledgement gaze	Visual contact attesting to attention paid to participant’s efforts and participation. (<i>I see you.</i>)		<i>Helped sustain participation by making everyone feel that they were seen and their efforts were noticed.</i>
Haptic modalities			
Touch guidance	(‘Pas de deux’) ‘Guide’ touches partner to indicate which foot to move, by pressing gently on corresponding hand (same side as foot).	E	<i>Helped clarify path of footsteps through ipsilateral haptic contact with hands. Reassured standing participants and prevented them from looking at their feet (posture).</i>
Inductive-touch cues	Touch inducing a change in participant’s way of moving (e.g., to subtly counter compensatory schemes/bad habits, or clarify how movement ‘should’ be made).	E	<i>Helped improve participant’s posture (complementing ‘lifting’ gaze) or counteract a compensatory/inappropriate scheme.</i>
Reminder-touch cues	Touch reminding participant about often-forgotten body part (hemineglect).	E	<i>Helped bring body part back into participant’s consciousness.</i>
Self-touch guidance	Self-contact through hands that self-instruct participant by touching limb (upper or lower) that needs to be coordinated.	E	<i>(Sitting) Helped clarify coordination sought between hands and feet by referring to ‘self-contact side’ rather than to left or right.</i>

Discussion

This section discusses the merits and shortcomings of the TIDieR Checklist used to describe the intervention, and what the term ‘adapted dance’ means in the context of this study. It presents the main challenges and limitations encountered with adapted dance in subacute rehabilitation post-stroke, then highlights the contribution of somatic-sensitive pedagogy and its complementarity to conventional therapies.

Merits and shortcomings of the TIDieR Checklist

The aim of the study was to respond to a literature advocating for better understanding of health intervention contents (Raw et al. 2012; Hoffmann et al. 2015) and to contribute to the development of a descriptive literature on dance interventions. To this end, the use of the TIDieR Checklist had merits and shortcomings. The tool can definitely help to improve the quality of descriptions of interventions across different healthcare systems and to assist reviewers and editors to assess health research. However, because dance is such a visual activity, a complementary tool appears necessary to us to thoroughly document the variety, quality and progression of movements targeting rehabilitation themes. We believe that the TIDieR can provide a valuable description of a dance intervention, and, to some extent, strengthen its replicability in terms of both its theoretical and practical logic, but audiovisual support (e.g., video clip database) is still needed to provide a complete description of the intervention. A detailed logic of intervention design and audiovisual supports are currently lacking in the scientific literature, which hinders the development of dance interventions and knowledge transfer. That being said, the components of a dance intervention can hardly be standardized as advocated by Hoffmann et al. (2015), and, in our opinion, the feasibility of such standardization

may even be questionable since the spontaneity of interactions and movements is desirable to make dance ludic and creative.

Adapted-dance intervention and dance therapy intervention

In order to intensify the patients' rehabilitation and contribute to their functional recovery, our intervention aimed to integrate relevant rehabilitation themes and foster participation. To achieve this, the adapted-dance intervention had to be informed by not only the patients' needs and characteristics, but by the therapists' expertise and evidence-based practice. Despite its therapeutic intent, our intervention design corresponded more to the term *adapted dance* than *dance therapy* since it was strongly influenced by the context and did not incorporate psychotherapeutic principles or the improvisational types of approaches widely used in dance movement therapy (DMT). Although it may occasionally have borrowed from dance therapy techniques like the 'Chacian circle' and mirroring (Braüninger 2014), our adapted-dance intervention relied more on flexible, structured content and a number of pedagogical modalities, some borrowed from rehabilitation practices. As defined in dance education, our intervention was designed 'to meet the needs and characteristics of [patients] with learning, coping or disability difficulties' (Martinet 2001, 103) and did so through one set of dance pedagogical modalities rather than through specific DMT approaches such as delineated by Braüninger (2014).

Challenges and limitations of dance in subacute rehabilitation post-stroke

The heterogeneity of stroke cases and the severity of the sequelae in the subacute phase of stroke presented the greatest challenge for the adapted-dance group-format intervention. The patients' physical and cognitive limitations hindered spontaneous movement and creativity, which may partly explain why improvisation often proved challenging. Moreover, it was sometimes risky to

rely on patients' movement proposals when it came to leading movements, since some of them had sensory and perceptual impairments that made their proposals potentially harmful for others. For the same reason, matching partners (e.g., mild versus severe motor deficits, left versus right side paralysis, cognitive problems versus motor impairments) for synchronized activities was also tricky. Therefore, guided improvisation was only used now and then to punctuate the sessions with more personal creative moments (mostly in groups, but occasionally in pairs); structured movements provided a better option for meeting the needs and characteristics of the six patients in the group.

The use of props was complicated as many of the patients were already using technical aids and could barely use their affected arm at all, let alone for wide or fast movements. The few props we used were therefore essentially intended to support and facilitate movements rather than inspire playful movement explorations. We avoided using multiple accessories because that would have required handling time and negatively impacted the patients' participation time. The intervention's group format may have fostered motivation and broadly stimulated participation, but probably did not stimulate the stroke-affected side of the body as much as individual rehabilitation therapies. The adapted-dance group format could not offer such specific stimulation, even with our stroke-differentiated pedagogy.

Subtleties of somatic-sensitive pedagogy

The somatic-sensitive pedagogy conferred a particular signature on our dance intervention. Table 6 shows how verbal, visual and haptic modalities (left-hand column) fostered confidence, calmness, satisfaction, motivation, engagement, self-regulation and empowerment among patients (right-hand column), from the researcher-dance educator's point of view. The subtleties

of such somatic-sensitive modalities need to be investigated and evaluated in further studies since they may somehow impact patients' participation and thus contribute to intensifying rehabilitation.

Adapted-dance intervention complementary to conventional therapies

Our adapted-dance intervention was complementary to rehabilitation therapies in different ways. We contend that it was more *experientially based* than *functionally based*. As shown in Figure 2, it offered group-inclusive modalities whereas most of the patients' therapies were individual in the context of subacute rehabilitation post-stroke. The latter therapies were intended to focus on functional and specific movement (without excluding the notion of pleasure whenever possible), whereas our adapted-dance intervention took a more intentionally ludic-artistic and global approach (without excluding functional concerns insofar as possible). This particularity distinguished our intervention from exercise- or task-based movement, while the stroke-differentiated modalities proved essential to its 'adapted' aspect. Borrowed from the educational field, differentiated pedagogy (Perrenoud 2016) aims to ensure that each 'learner' is in fruitful learning situations as often as possible. Such a 'learner-centred' pedagogy echoes the specificity of individual rehabilitation therapies, and to some extent matches their 'patient-centred/person-centred' approach.

Figure 2. Adapted dance as a complementary intervention, experientially based intervention in subacute rehabilitation post-stroke

Strengths and limitations of the study

This study sought to describe an intervention informed by stroke rehabilitation therapists. The fact that mainly physiotherapists and occupational therapists participated may constitute a limitation, although they represent the two disciplines most involved in stroke rehabilitation. The use of several data collection tools allowed us to identify more clearly what we perceived to be pedagogically effective and ineffective. The researcher-dance educator's perspective was chosen for the evaluation of the pedagogy's effectiveness, but other perspectives, such as that of the rehabilitation assistant, could be considered in further studies. Considering the qualitative nature of the study, the content and pedagogy of our intervention cannot be generalized, nor can its perceived effectiveness. Nonetheless, the results of the study provide relevant information for the development of dance interventions. The use of audiovisual recordings limited the interpretation bias as they visually supported and matched the 'live' perceptions. Given that data saturation was attained through the recurrence of the rehabilitation therapists' comments/recommendations and of the researcher-dance educator's notes, different intervention designs could emerge from other disciplinary collaborations, as well as different assessments of their intervention pedagogy.

Conclusion

Describing what a dance intervention consists of is a complex task, and making it a replicable intervention is even more complex and perhaps even unfeasible – if not undesirable, as spontaneity remains important for the ludic dimension of dance. The TIDieR Checklist has the advantage of being a validated tool in the health field, but the description of the intervention it may provide should be complemented by the use of audiovisual tools to help operationalize it into movements and support knowledge transfer. While such a description does not offer a copy/paste formula, it could well be valuable for improving and better evaluating dance

interventions. When it comes to adapted dance, the ‘adapted’ aspect of the intervention lies in its content and pedagogy, both informed by the specific intervention context. Adapting only one of the two is insufficient to ensure that the intervention is truly informed by the context, and thus, relevant. In stroke rehabilitation, structured patterned dance movement modalities appear to be more effective than improvisational modalities. The ludic-artistic pedagogy of dance differentiates it from typical movement exercise and may explain much of the interest underlying participation in most dance interventions. Subtle somatic-sensitive pedagogy offers another means of fostering participation, hence the importance of paying closer attention to dance intervention pedagogy. This study provides several types of pedagogical modalities that warrant further exploration and improvement in subacute post-stroke rehabilitation, as well as in other dance intervention contexts. It invites dance professionals to contribute to the development of a descriptive literature essential to the field of dance intervention.

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Declaration of interest statement

The authors have no conflicts of interest to declare.

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