Biodanza and Other Dance Forms as a Vehicle for Social-Emotional-Learning in Schools: A Scoping Review

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Abstract

In this scoping review, the literature on the relationship between dance and Social Emotional Learning (SEL) was consolidated. Research of various forms of dance on psychosocial outcomes among K-6 populations included: increased sense of belonging, violence prevention, and increased creative thinking and problem-solving responses. The dance form, Biodanza, in particular, may be useful in engaging students in the active practice of social skills, appropriate use of body language, self-regulation, self-awareness, and boundaries. We suggest that using dance as a tool for SEL in the classrooms may contribute to improved student mental health and to more inclusive schools.

Introduction

In striving towards inclusive education in public schools, addressing students' Social Emotional Learning (SEL) needs, such as student capacity for understanding and managing their emotions in healthy and appropriate ways, is important (CASEL, n.d.). For this paper, we define SEL according to the international Collaboration for Academic, Social, and Emotional Learning (CASEL):

> Social and emotional learning (SEL) is an integral part of education and human development. SEL is the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions. (n.d.)

For students with persistent and chronic SEL needs, waiting lists for school-based psychological services have traditionally been long (Ontario Psychological Association, 2016; Njie et al., 2018), though there have been recent provincial efforts to reduce wait times (Nova Scotia Department of Education and Early Childhood Development, 2017; People for Education, 2018). Educators are increasingly called upon to expand their roles in order to address unmet student mental health needs.

Recently, provincial departments of education have officially embraced student wellness. School boards are now required to provide system and school improvement plans with wellness goals (Nova Scotia Department of Education and Early Childhood Development, 2020; Alberta Teachers Association, 2019). While SEL has been taught in schools for many years now, the formalization of student mental health in school plans legitimizes SEL as necessary school-based content, parallel in importance to numeracy and literacy. In some jurisdictions, SEL is embedded directly into traditional subjects like Math, for example (Ontario Ministry of Education, 2020), and a strong case is made for the natural affinity between SEL and English Language Arts curriculum (Storey, 2019).

We think these are important, worthwhile changes given that students' increased understanding of their emotions—and their causes—and how to respond to them in healthy ways, can result in increased school success (CASEL, n.d.). Early intervention and proactive SEL can promote more restorative approaches to interpersonal conflict in schools and could also have other positive sequelae, such as reduced likelihood of childhood onset mental illness, increased numbers of high school graduates, and reduced burden on mental health resources.

As educators seek out SEL content, some have seen the connection with dance (Pereira & Marques-Pinto, 2018; Toppen, 2019). Dance is kinesthetic, social, interactive, creative, musical, and engaging. Given that one of the "five to thrive" (UBC Wellbeing, n.d.; Kutcher, 2021) is regular exercise, and dance may also be connected to SEL, we were keen to understand what evidence exists in support of dance and SEL outcomes. Joana has direct experience with Biodanza, a dance intervention she has experienced as useful in engaging students in the active practice of social skills, appropriate use of body language, respect for self and others, self-awareness, boundaries, critical thinking, and creative problem-solving. Our scoping review is an attempt to consolidate the current research on Biodanza and other dance interventions as they relate to SEL outcomes in public schools.

Biodanza—An Introduction

Fig. 1: Biodanza #1(Photo used with permission from Josanne Broersen – Facilitator/Didact Amsterdam School of Biodanza, 2013).

Biodanza is a facilitator-led practice that follows a series of dance, play, and/or interactive exercises, designed to activate the sympathetic nervous system, followed by the activation of the parasympathetic nervous system, which restores physiological balance as it improves mood and releases anxiety

(Stueck et al., 2009). Biodanza does not involve choreography and it is suitable for all ages and fitness levels. It was developed in the 1960s by Rolando Toro Araneda, a clinical psychologist and anthropologist from Chile. In an effort to humanize psychiatric practice, he began investigating the effects of music and dance on psychiatric patients at the Psychiatric Hospital of Santiago, and found that certain movements and exercises accompanied by music seemed to improve depressive symptoms, among others. Biodanza means "dance of life." It is a system that integrates music, movement, and interactions, with others to provide experiences of being acutely aware of oneself and others in the present moments of Biodanza practice. Biodanza promotes human development through "vivencias," a Spanish word used to describe basic experiences of being human. These experiences can be those of vitality, creativity, affection, and equanimity. Through the use of certain movement exercises, participants work towards greater understanding of themselves, others, and the wider community. Biodanza is practiced worldwide, with two Biodanza schools in Canada: one in Montreal, the other in Quebec City.

Protocol

We used and adapted the Arksey and O'Malley (2005) scoping framework, as well as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses - Scoping Reviews (PRISMA-ScR) checklist (Tricco et al., 2018). We searched four electronic databases: Educational Resources Information Center (ERIC), ProQuest Research Library (ProQuest), Taylor and Francis, and Wiley Online Library. The databases were chosen because of their multidisciplinary content that includes education, dance interventions, and psychotherapeutic literature. Studies were screened, relevant data was extracted, and a narrative synthesis of an analysis of the current research was written. The population, intervention, comparison, and outcome (PICO) (Greenhalgh, 2019) criteria, was utilized for the identification of search terms as outlined below.

Eligibility Criteria

The search was limited to English-only peer-reviewed full-text research literature that investigated dance interventions primarily for children and adolescents, but also other age groups, published between 2000 and 2020. Publication country of origin was not limited in order to include studies from Europe, where the bulk of Biodanza research originates.

Search

As Biodanza research in general is still nascent, searches were expanded to include "dance intervention," "dance program," "dance movement therapy," and "children." This resulted in finding 319 articles. Duplicates were removed. Through title and abstract review, studies were reduced to seven articles. An additional 19 articles were obtained via citation chaining, particularly scanning reference lists of studies that investigated Biodanza specifically and those that most closely resembled SEL-like dance interventions in K-12 education.

Researchers used a wide variety of key words in their titles such as "empathy," "sense of belonging," "problem-solving," and "resilience." Other terms such as "interpersonal competence", "social competence," and "psychosocial functioning," were accepted. Lobo and Winsler (2006) define social competence as: "the capacity for children to attain social goals, engage effectively in complex interpersonal interaction, make and maintain friendships, gain entry to social groups and achieve peer acceptance" (p. 501). Other studies use terms such as "emotional intelligence" (San-Juan-Ferrer & Hípola, 2020) and "social reciprocity" (DeJesus, 2020), both of which are analogous to social competence. It is important to note that "SEL" and "dance intervention" alone did not yield any results.

All studies that were specific to dance and the key words identified above were included. Twenty-six articles were included in this scoping review (see Appendix A, Table 1).

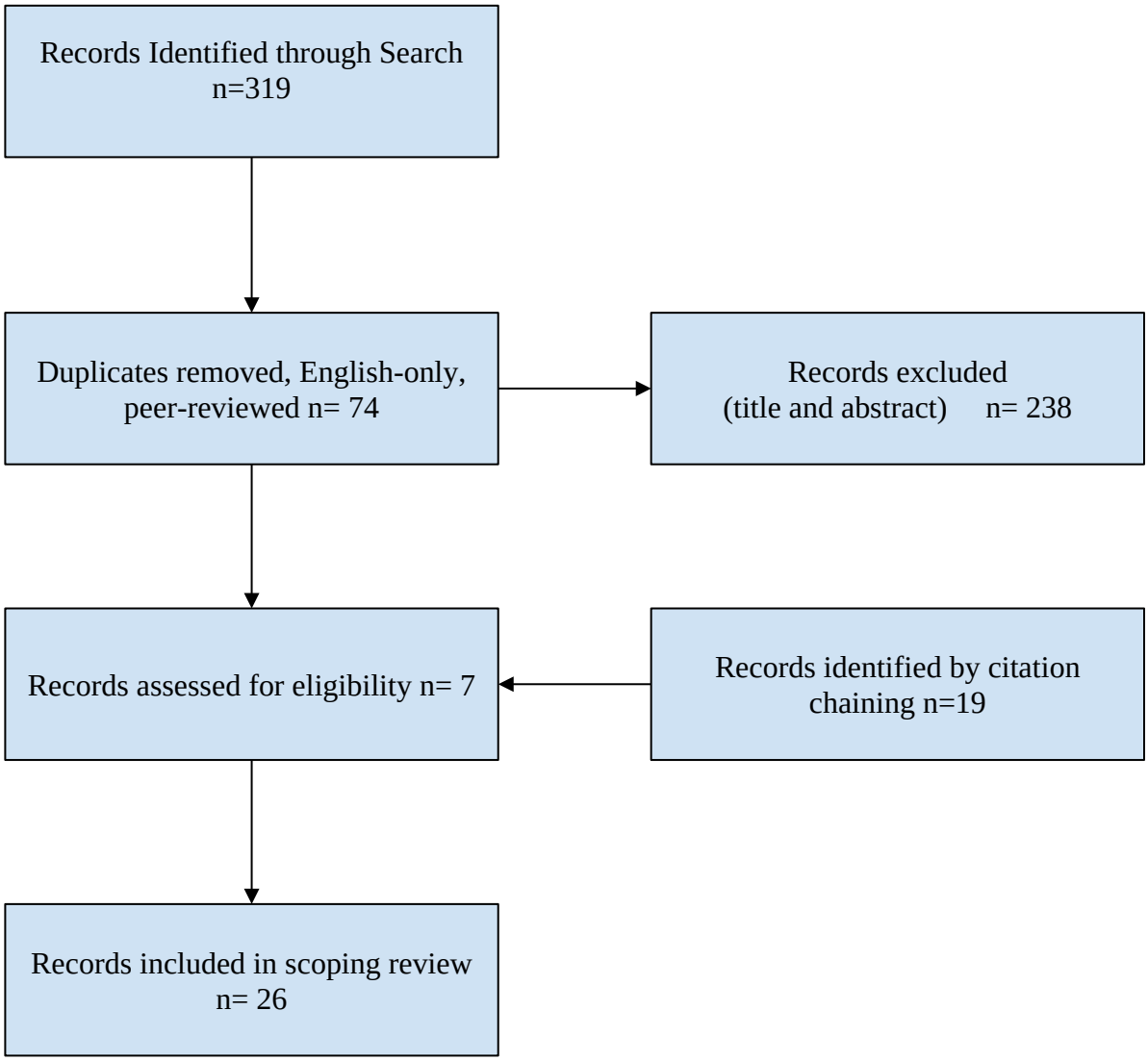

Fig. 2: PRISMA Flow Diagram of the Database Search.

Selection of Sources of Evidence

Of the 26 articles selected, one was a meta-analysis and seven were systematic reviews (see Table 2). The meta-analysis investigated the psychological effects of dance movement therapy and dance in the general population. One systematic review was on the effects of dance interventions on the psychological well-being of children and young people. Another systematic review on emotional intelligence and dance in various age groups and in diverse populations was found to be in congruence with SEL. Finally, two additional systematic reviews on the effects of dance therapy on various age groups and in culturally diverse populations were found. These systematic reviews were selected in order to determine whether or not a foundation has been established that demonstrates dance in general can have psychosocial benefits in line with SEL, and that the topic is worthy of continued research and implementation, particularly in school settings.

Results

Meta-Analysis and Systematic Reviews

Of these eight higher order studies (see Appendix B, Table 2) there were no restrictions on age, gender, ethnicity, clinical or non-clinical samples, length of treatment, or language, and the studies in each review are all unique, in that no study is found in more than one review. This is perhaps due to the fact that SEL captures a number of outcomes, depending on whether the research is clinical, pedagogical, or other (to be explained further below). These studies contrasted using a number of variables and outcomes. These included: target outcome(s) (self-regulation and psychosocial competence/SEL, or both); target population(s) (preschool children, K-6 students, adolescents, adults, general population); and intervention program types, [Dance Interventions (DI), Dance Movement Therapy (DMT) and Biodanza (BD).]

Although the meta-analysis included in this scoping review reported evidence that DMT and dance are effective interventions in many clinical outcomes, such as quality of life and mood, the effects that most align with SEL, namely, social and interpersonal competence, remained inconclusive. Koch et al. (2014) hypothesized that this may have been due to "the many different operationalizations of interpersonal competence" (p. 61). It is certainly difficult to measure social skills, as these tend to be in constant flux depending on many other variables, such as context, perceived interpersonal competence versus objective interpersonal competence, and so on.

It is also possible that length of intervention may be an important variable, as most interventions in the studies presented here lasted less than three months. Continued, diligent participation in the intervention might yield more positive results as new social and interpersonal skills are practiced concurrently within the intervention, as well as, hopefully, in participants' daily lives. Continued exposure to the intervention might prolong the effect on self-regulation, or perhaps participants learn to self-regulate long enough to be able to develop more higher-level social skills. The SEL gains may be longer lasting, though, beyond the intervention period. It might also be easier for participants to see improvements in the protected

sphere of a controlled intervention, but then more difficult to implement and sustain new skills with family and friends, as context greatly influences self-regulation and behaviour (Stokes & Baer, 1977, in Evans et al., 2017).

In the systematic review on the effects of DMT on Autism Spectrum Disorder, DeJesus et al. (2020) found "substantial effects on negative symptoms, as well as on communication, body awareness, behaviour and social reciprocity when compared to other interventions such as physiotherapy, occupational therapy, equine-assisted therapy, social skills training and psychotherapy" (p. 5). Autism, being one of the diagnoses that most affects psychosocial functioning, thereby requiring SEL intervention, was found to be positively influenced by DMT. In the systematic review by Strassel et al. (2011), the authors stated that dance's "social component could be therapeutically valuable because human interaction is important for all aspects of psychological functioning" (p. 58) and "dance therapy also has the advantage of nonverbal communication, which enables participants to express their feelings without words" (p. 58). All other systematic reviews presented here found that similar forms of dance and movement education can be used as a tool in increasing the capacity for self-regulation, improving psychological well-being, and developing the social skills necessary for resolving interpersonal conflicts (Burkhardt et al., 2012; Millman et al., 2020; San-Juan-Ferrer & Hípola, 2020; Sheppard & Broughton, 2020).

Other Studies Reviewed

In the 18 studies included in this scoping review (not including systematic reviews or the meta-analysis), all the dance interventions were claimed to be effectively used as a vehicle for SEL in the classroom (see Appendix A, Table 1). Outcomes included: increased sense of belonging (Kreutzman et al., 2018); increased social skills (Masadis et al., 2019); psychological engagement and socioemotional functioning (Archbell et al., 2019); violence prevention (Koshland et al., 2004); improved emotional responses and neurohormone modulation (Jeong et al., 2005); increased creative thinking and problem-solving responses (Lai Keun & Hunt, 2006); increased self-esteem and well-being (Connolly et al., 2011); reduced internalizing problems, and increased self-trust (Duberg et al., 2016); social engagement (Nelson et al., 2017); social competence (Lobo & Winsler, 2006); dance as a teaching tool (Sharma et al., 2020); social-emotional development (Rajan & Aker, 2020); and accelerated learning of skills via dance (Golding et al., 2016).

While the terminology of outcomes may vary greatly, the evidence suggests that dance in all its forms may be effective for implementing SEL programs in schools, though more evidence is needed specifically related to SEL programming. The classroom is the space for practising and developing psychosocial skills that might be generalizable to student life throughout the school and community, including student life at home, with parents and siblings. Kreutzman et al. (2016) states, "with inclusiveness of classrooms as a major educational policy, feelings of belonging to a class - notwithstanding its inherent significance for positive academic achievement - can be a central indicator for a genuinely inclusive learning environment" (p. 11). Given these findings, dance as a form of SEL may make a lasting contribution towards creating inclusive schools and classrooms, we cautiously suggest.

Importance of Target Populations

The evidence of effectiveness of SEL-based dance interventions on psychosocial functioning is most robust in younger children, as 14 of the studies focused on children in K-6, both males and females (Archbell et al., 2019; Burkhardt et al., 2012; Golding et al., 2016, Greaves et al., 2016; Koshland et al., 2004; Kreutzmann et al., 2018; Lai Keun & Hunt, 2006; Lobo & Winsler, 2006; Masadis et al., 2019; Nelson et al., 2017; Rajan & Ake, 2020; Sharma et al., 2020; Stueck et al., 2013, 2016). This may be due to the fact that younger children are learning the limits of acceptable behaviour as they develop more complex relationships with peers and adults over the course of their K-6 education. Older students, particularly males, may be less engaged in a SEL-based dance program due to preconceived notions about dance, and self-consciousness about "performing" in front of others. Also, by middle school, adaptive social strategies may have already been acquired and maladaptive coping strategies may have become ingrained and less resistant to intervention (Kutcher, 2017). Hence, the reason why earlier intervention is best.

For example, in the preschool age bracket, a study by Rajan and Aker (2020) found that, "31% of preschoolers who participated in in-school dance developed a stronger sense of self and 18% of preschoolers who participated in dance established stronger friendships with their peers" (p. 6), as measured by the four sub-scales for social-emotional development, under the Desired Results Developmental Profile (DRDP). For Kindergarten, the work of Stueck and colleagues (2013, 2016) has shown significant changes in self-regulation as measured by cortisol saliva post Biodanza intervention, though sample sizes were small, affecting the ability to generalize these results. In the first through third grade age bracket, Koshland et al. (2004) found a "significant decrease in students instigating fights, failing to calm down, frustration intolerance, and throwing articles" (p. 69). In the fourth to sixth grade age bracket, post-intervention, Masadis et al. (2019) found a "significant decrease in inappropriate and aggressive social behaviour and a dramatic rise in socially acceptable manners" (p. 517).

Gender Differences in Dance Research

All age groups were included in order to also include studies specific to Biodanza. All other studies in this scoping review focused mainly on adolescent or adult females, which suggests that the practice may be less appealing to males after adolescence. Furthermore, Stueck et al. (2009) state that, "further research should address the issue of gender-specific differences in the effects of Biodanza on immunological parameters" (p.111). This suggests that there may be physiological differences between male and female responses to an intervention like Biodanza, in addition to, generally speaking, female interest in dance versus male disinterest in dance. There was no research found that attempted to account for different gender identities.

Dance as a Pedagogical Tool

While people who engage in dancing activities might do so simply because they all find it enjoyable, dance also serves as a pedagogical tool. Dance has been used with efficacy "as a kinesthetic tool for accelerating learning whilst assisting educators to recognize movement methods as potent delivery strategies" (Golding et al., 2016, p. 239). Furthermore, according to Sharma et al. (2020), "dance-based teaching can potentially ignite cognitive learning in children, since physical movement deepens neural connections" (p. 30). Thus, more educators are becoming increasingly aware of using dance in a cross-curricular fashion, not just teach dance as a subject on its own.

Fig. 3: Biodanza #1 (Photo used with permission from Cristiano Martins, Facilitator/Didact Biodanza School SRT of Porto and Portugal, 2019).

Dance as a Clinical Tool—DMT and Biodanza

Various therapeutic dance forms like DMT, as well as recreational dance forms, like Ballroom dance for example, were included in this scoping review in order to establish the connection between dance and SEL. Even when SEL is not explicitly embedded in the intervention, SEL can still be seen as being present as dance practised in groups is inherently social and interactive. At present, Biodanza may be found somewhere in between the two poles, even though clinical interest in the practice is increasing (as it is a prescribed intervention in hospitals in Europe and in community health centres in Brazil). In the six studies specific to Biodanza, even subclinical forms of dance were used to achieve results, such as improved mood and increased self-regulation in children and adults (Greaves et al., 2016, Stueck et al., 2009, 2013, 2016, 2019). Biodanza goes beyond this to include an experiential psychoeducational

component. According to Stueck and colleagues (2009), in Biodanza the goals are: "…a well-regulated internal state" and "…the establishment of a state of human integration in the context of the struggles to express one's individual, genetically-determined potential" (p. 100). Dance and movement exercises in Biodanza are designed to achieve affective psychomotor integration of the individual, by establishing synchrony between thoughts, feelings, and actions, as well as social integration between participants (Stueck et al., 2009). The kinesthetic, psychomotor, self-regulating skills learned in Biodanza, like other dance and movement approaches, with regular practice, have the potential to become transferable, pro-social skills to be used in and outside the classroom, as well as, in the greater social sphere.

Research Gaps

Presently, there is limited research available on Biodanza specifically. The current research shows that the effects on self-regulation are statistically significant, however the sample sizes are very small—a serious limitation in these studies—and some of the literature is poorly translated. There are currently no randomized controlled studies for Biodanza. The school community would be the ideal place to propose controlled studies, as cohorts could be easily divided into Biodanza intervention and control groups, such as exercise, for example. However, there may be other barriers that may limit sample sizes, such as parental authorization for participation in research, and student opt-out options.

Future studies are needed that attempt to address the gender and age differences seen in the current results for the K-6 school-aged population. The relationship between SEL as integrated in traditional subjects like ELA and achievement scores is also important, and needed. Overall, because of the results of the systematic reviews on dance, an increased focus on high-quality studies, with increased replication, would bolster the current research on this topic.

Limitations

There are some limitations associated with this scoping review. Because target outcomes varied greatly across the various databases, depending on whether their focus was more clinical, as in "psychosocial functioning" or more educational, as in "social emotional learning," "social competence," or "emotional intelligence," most of the studies included were found via citation chaining, which makes the replication of the initial search more difficult. As more educational research adopts the term "Social Emotional Learning" as a catch-all for the process and the target outcomes in the design of any SEL-inspired intervention, initial database searches may become more transparent and more easily replicated. As previously stated, "SEL" and "dance" did not yield any results, but a connection has been established here, even if in a circumvented fashion.

Recommendations

More research specific to Biodanza with children is required to be able to establish an understanding of the benefits of the practice, before considering training of educators, and fuller implementation in classrooms. In the meantime, other forms of dance that have been more rigorously studied like DMT, and certainly non-clinical or recreational dance forms, may be used to teach SEL in the classroom, though with attentiveness, given the results of the meta-analysis. Certainly, more research on the direct connections between dance and SEL is needed; however, we note the following:

> Dance participation appears to contribute positively to individuals' wellbeing and health across cultures and age groups. It seems to provide a safe context for social engagement and building communities, which crucially enables participants to construct and maintain their own wellbeing and health in a range of ways: cognitive function, physical health, stress reduction, self-perception and mental health. (Sheppard & Broughton, 2020, pp. 13–14)

As teachers' mental health literacy has increased over the years, so too has the implied expectation that teachers do more for students' psychosocial development. The reality is that, as educators, we seem more often engaged in reactive, rather than proactive, interventions. Perhaps, this is where connections between clinical and educational research may be found in order to assist us in maximizing the time window for early intervention. As SEL is being embedded across the curriculum, and since dance is also part of that curriculum, the hope is that this scoping review will spark interest in SEL-based dance interventions. More research on the subject is warranted—a recommendation echoed similarly in the systematic review by Sheppard and Broughton (2020)—in order to validate the current research available and to legitimize the practice of Biodanza and other forms of dance as psychosocial development tools in K-12 classrooms.

Fig. 4: Biodanza #3 (Photo used with permission from Michelle Dubreuil Macek - Didact Biodanza IBF Facilitator/Trainer, Johannesburg, South Africa/Italy/Brazi, 2017)

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Appendix A

Table 1. Research related to Biodanza (BD), Dance Movement Therapy (DMT), or other Dance Intervention (DI) and related variables, Social Emotional Learning (SEL)

Authors, Year and Country	**Publication**	**Target population (TP); Participants (P) and Data Sources (DS); Experimental Group (EG); Control Group (CG)**	**Intervention**	**Aim (A) and Research Design (RD)**	**Conclusion(s)**
Archbell et al. (2019) Canada	Merrill-Palmer Quarterly	Children 6-8 years of age P: N = 166 children (75 boys and 91 girls ages 6 to 8)	DI (Performing arts activities (dance and music)	A: to investigate the effects of Structured Performing Arts Activities in Early to Middle Childhood on psychological well-being, engagement, stress, and SEL. RD: Quasi-experimental	Girls are more likely than boys to engage in dance programs. Stress in performing arts was positively associated with emotional problems and negatively associated with prosocial behaviors. Results were significant (p=.001)
Burkhardt and Brennan (2012) UK	Arts & Health	TP: 5-21 year olds	DI (Cultural dances; Modern dance; Dance aerobics; Hip Hop; African dance; Ballet: Jazz dance; folk dance.)	A: A systematic review of 14 studies on the effects of recreational dance interventions on the health and well-being of children and young people. RD: 4 RCTs, 7 Non-RCTs, 2 cross-sectional studies; 1 prospective cohort study.	Significant evidence of efficacy on physical outcomes. Limited evidence of efficacy on psychosocial outcomes. Low-quality studies.
Connolly et al. (2011) UK	Research in Dance Education	TP: Female adolescents (age 14) P: N=55 DS: Rosenberg Self-esteem scale (Rosenberg, 1965); Intrinsic Motivation Inventory; 20-meter shuttle run test to measure aerobic capacity	DI (Dance 4 your Life - 5 to 12 hours of dance classes over 6-week period)	A: to explore the health and well-being implications of a contemporary dance intervention for female adolescents. RD: Quasi-experimental	Self-esteem statistically increased (p=.01), as well as aerobic capacity(p=.001), but not significant in other areas.
DeJesus et al. (2020) Brazil	Complementary Therapies in Medicine	TP: Adults with normal to high-functioning ASD N=+266	DMT	A: A systematic review of 5 studies investigating how dance promotes positive benefits for negative symptoms in autism spectrum disorder (ASD) RD: 2 RCTs, 3 CTs	All studies showed the influence of dance on empathy, emotional expression, body awareness, and behaviour. Significant evidence that dance can be effective in improving reciprocity and the communication process between participants.
Duberg et al. (2016) Sweden	International Journal of Qualitative Studies on Health and Well-being	TP: Adolescent females (ages 13 to 18) 83% Swedish born P: N=112 EG N=59 CG N=53 DS: semi-structured interviews; NVivo 10 software program (QSR international)	DI EG: Twice weekly sessions for 8 months CG: no intervention	"I feel free": Experiences of a dance intervention for adolescent girls with internalizing problems. RD: Randomized Controlled Trial	DI led to increased bodied self-trust, more acceptance, less comparison with peers, increased empowerment, appropriate emotional expression, and an increased ability to approach life with a sense of freedom and openness.

Golding et al. (2016) UK	Research in Dance Education	TP: Children (early years) P: N=55 DS: semi-structured interviews; Goodenough-Harris draw-a-person test	DI EG: Developmental Dance Movement (DDM) 8, 35-minute sessions CG: no intervention	A: to Investigate learning through developmental dance movement as a kinesthetic tool in the early years foundation stage. RD: Quasi-experimental	Pre-post scored drawings showed significant differences in visual-motor integration and developmental maturity in children (p=.005).
Greaves et al. (2016) Latvia	Society Integration Education Proceedings of the International Scientific Conference	TP: First grade school children (ages 6-7) P: EG N = 10 CG N = 9 DS - cortisol saliva testing; Prosocial scale, Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997)	BD EG: TANZPRO - Biodanza CG: no intervention	A: to investigate changes of emotional and social competence of 1st grade school children in TANZPRO - Biodanza intervention group. RD: Quasi-experimental	EG showed statistically significant improvement in emotion regulation outcomes, prosocial and internalizing behaviour (p=.02). *very small sample size
Jeong et al. (2005) Korea	International Journal of Neuroscience	TP: Adolescent girls (mean age 16) P: N= 40 EG N=20 CG N=20 DS: plasma serotonin and dopamine concentration; Symptom Check List-90-Revision (SCL-90-R) (Derogatis, 1977)	DMT EG: (45 minute sessions 3 times per week for 12 weeks) CG: no intervention	A: to evaluate the effects of DMT on adolescents with mild depression RD: Randomized Controlled Trial	Dance movement therapy significantly improves emotional responses and modulates neurohormones in adolescents with mild depression, including interpersonal sensitivity and hostility (p=<.001).
Koch et al. (2014) Germany/USA	The Arts in Psychotherapy	TP: Various age groups, various diagnoses N=1078	DI and DMT, but also other types of dance (creative dance, authentic movement, rumba, folklore, classic, etc.) in various durations and frequencies of sessions	A: a meta-analysis of the effects of dance movement therapy and dance on health-related psychological outcomes. RD: 23 studies	DMT and dance are effective interventions in many clinical contexts, as there were increases in quality of life, mood, etc., although effects for interpersonal competence remained inconclusive.
Koshland et al. (2004) USA	American Journal of Dance Therapy	TP: Children in grades 1 to 3 53% Hispanic; 21% Native; 22% Caucasian Low SES - living at or below poverty line P: N= 54 DS: Student Response Form; Behaviour Incident Report Form	DI EG: Dance/movement therapy-based violence prevention program (50-minute sessions for 12 consecutive weeks) CG: no intervention	A: to evaluate the effects of a violence-prevention program on school children RD: Quasi-experimental	EG showed a significant decrease in the number of aggressive incidents and reduction of problem behaviours, as well as an increase in prosocial behaviours (p<.001).
Kreutzmann et al. (2018) Germany	European Journal of Social Psychology	TP: Children in grades 5 to 9 Mean age: 11 years P: N=606 N=311 girls N=295 boys CG N= 292 DS: The Inclusion of Other in the Self (IOS) scale; Social Networks indicators; measured outdegree and indegree centrality	DI EG: Dance project (students collaboratively developed and publicly performed a choreographed dance designed to foster social integration.) CG: no intervention	A: to investigate how social networks mediate the effect of a dance intervention on students' sense of belonging to their classroom. RD: Quasi-experimental	Social belonging at post-test was positive and significant (p<.001), (d=0.14). The dance intervention increased students' sense of belonging and social acceptance.

Lai Keun and Hunt (2006) Singapore/USA	Research in Dance Education	TP: Chinese Primary school children with no previous dance experience (age 7) P: N=39, 19 girls, 20 boys DS: Observations; video recordings	DI 5 sessions	A: to observe the effects of dance and movement on Singapore children's creative thinking and problem-solving responses. RD: Quasi-experimental	Children acquired new skills and movement responses, such as increased evidence of personal and general space knowledge, as well as increased risk-taking as part of the creative problem-solving process.
Lobo and Winsler (2006) USA	Social Development	TP: Preschool children (ages 39 months to 62 months) Mean age =50 months 67% Hispanic: 16% Black; 5% Asian; 7% Arabic; 5% Caucasian Low SES - income below poverty line N=40 P: EG N=21 CG N=19 DS: Social Competence Behaviour Evaluation: PreSchool Edition (SCBE) (LaFreniere & Dumas, 1995)	DI EG: biweekly 35-minute sessions for 8 weeks) CG: Free play, with no music or dancing	A: to investigate the effects of a creative dance and movement program on the social competence of head-start preschoolers. RD: Randomized controlled trial	EG children made significantly greater gains in social competence, and significant reductions in internalizing behaviour (depression, withdrawal, anxiety) and externalizing behaviour (anger, aggression, impulsivity, hyperactivity) ($p<.001$).
Masadis et al. (2019) Greece	International Journal of Instruction	TP: Elementary school children (Grades 4-6, ages 9 to 12) P: N = 206 EG: N=132 (66 male, 66 female) CG: N=74 (43 male, 31 female) DS: Matson Evaluation of Social Skills with Youngsters (MESSY-II)	DI 16 lessons (2/week) concerning the development of social skills through Greek traditional dance.	A: to explore traditional dances as a means of teaching social skills to elementary school students. RD: Quasi-experimental	Significant decrease in inappropriate and aggressive social behaviour and increase in socially acceptable behaviours.
Millman et al. (2021) UK	Clinical Psychology & Psychotherapy	TP: Clinical population; all ages	DMT	A: A systematic review of 15 studies towards a neurocognitive approach to dance movement therapy for mental health RD: RCTs	Evidence of clinical efficacy of DMT in that its mechanisms include improvements of embodied cognition and interoception. DMT has the possibility of being effective in neurorehabilitation and trauma treatment due to how it involves both the body and the mind.
Nelson et al. (2017) USA	Education and Training in Autism and Developmental Disabilities	TP: Preschool-aged children with Autism Spectrum Disorder P: N=3 DS: Educator observations; recordings of percent of engaged time in activity.	DI One half-day session including 10 minutes of Dance and Movement, unknown duration.	A: To observe the use of a Creative Dance Intervention Package to increase social engagement and play complexity of young children with Autism Spectrum Disorder. RD: Quasi-experimental	Creative Dance activities appeared to result in more complex and interactive play. Over the course of the intervention, participants moved closer to their peers and joined with them in the variety of dance activities explored.
Rajan and Aker (2020) USA	Journal of Dance Education	TP: Children ages 3-5 92% Hispanic 80% identified as high-risk 18% IEPs P: N=69 DS: Desired Results Developmental Profile (DRDP) - 4 scales for social emotional development	DI EG: 30 minutes weekly over entire academic year CG: no intervention	The impact of an in-school dance program on at-risk preschoolers' social-emotional development. RD: Quasi-experimental, longitudinal	In-school dance program had a positive effect on social-emotional development, particularly in children's ability to identify themselves in relation to others and in the improvement of their relationships with peers.

San-Juan-Ferrer and Hípola (2020) Spain	Research in Dance Education	TP: Ages 0-94	DI (Dance; Sports Dance; Korean dance; Belly dancing; Classical, Unspecified.)	A: A systematic review on 49 studies on emotional intelligence and dance	Significant effect of dance on self-efficacy, emotional self-control, and expression of negative and positive emotions.
Sharma et al. (2020) New Zealand	New Zealand Journal of Educational Studies	TP: Primary school students P: EG: N=101 CG: N=86 DS: Assessment Tools for Teaching and Learning (AsTTIe) questionnaire, Assessing Well-being in Education (AWE) questionnaire, Strengths and Difficulties Questionnaire (SDG); Actigraph accelerometer; focus group interview	DI EG:18 dance sessions across 6 weeks of Dance and movement intervention CG: No intervention	A: to investigate the integration of a dance and creative movement program in 4 New Zealand primary schools. RD: Quasi-experimental	Evaluation procedures of the project to be disseminated in future publications.
Sheppard and Broughton (2020) Australia	International Journal of Qualitative Studies on Health and Well-being	TP: all ages	DI (Salsa; Contemporary; ballroom; Scottish country dancing; modern; line; Bollywood; tango.)	A: A systematic review on the effects of dance and music on promoting well-being and health. RD: 28 studies, RTCs, comparative studies	Dance participation appears to contribute positively to individuals' well-being and health across cultures and age groups.
Strassel et al. (2011) Netherlands/ USA	Alternative Therapies in Health & Medicine	TP: Clinical and sub-clinical populations; all age groups, predominantly adults	Dance Therapy; DMT; dance-based aerobic exercise; Ballroom dance; culturally based dance.	A: systematic review of the evidence for the effectiveness of dance therapy. RD: 8 reviews and 18 RCTs	Most studies focused on the effects of dance on mental disorders. All reported benefits or neutral findings. Significant improvements in Quality of Life. Low-quality studies.
Stueck et al. (2009) Germany	Signum Temporis	TP: Adults - School teachers P: N=13 DS: saliva testing pre and post intervention; subjective relaxation reported in 17-point scale (developed by Binz & Wendt, 1986)	BD EG: Biodanza (10 weekly sessions) CG: STRAIMY (Stress-reduction with elements of Yoga)	A: to measure the effects of Biodanza on secretion of Immunoglobulin A (IgA) and subjective feeling of relaxation RD: Quasi-experimental	Significant increase ($p \leq .05$) in IgA in 6 out of 10 sessions.
Stueck et al. (2013) Germany	Problems of Education in the 21st Century	TP: Children (4 to 6) P: N= 20 girls DS: saliva testing pre and post intervention	BD TANZPRO - Biodanza (10, weekly, 45-60 minute sessions)	A: to measure the effects of TANZPRO - Biodanza on participants' Immunoglobulin A, Testosterone and heart rate. RD: Quasi-experimental	Intervention had a short-term positive effect on immunity of tested children.
Stueck et al. (2016) Germany	Body, Movement and Dance in Psychotherapy	TP: Children (4-6 years of age) P: N=10 girls DS: saliva testing pre and post intervention	BD TANZPRO -Biodanza	A: to measure the effects of Biodanza on changes of cortisol levels and self-regulation RD: Quasi-experimental	Biodanza has a short-term positive effect on self-regulation in 4-6 year olds (as measured by improved cortisol modulation).

Stueck et al. (2016) Germany/UK	Signum Temporis	TP: Adults N=13 DS: saliva testing pre and post intervention	BD Biodanza for adults	A: to evaluate the effects of weekly Biodanza on stress reduction and well-being in adults. RD: Systematic review of 7 quasi-experimental studies of weekly Biodanza classes in Germany (5), Italy (1) and Argentina (1) (since 1998)	Decrease in impatience (irritability), increased motivation, improved mood, increased capacity for appropriate emotional expression, and increased immunity (as measured by IgA) with ongoing sessions (long-term effects) p=0.09, d'=0.72. *very small sample size
Stueck et al. (2019) Indonesia	Health Psychology Report	TP: Adults N=34 EG N=17 CG N=17	BD EG: (90-minute sessions, duration unknown CG: School of Empathy (verbal) (explicit teaching of skills)	A: to explore the implementation of Biodanza (nonverbal part) and School of Empathy (verbal part) in expressing emotions and needs among adults	Biodanza participants were significantly more able to express their emotions ($p<.05$), although the ability to express needs was not significant.

Appendix B

Table 2. History of Meta-Analysis and Systematic Reviews on DMT/Dance/Biodanza effects on participants' psychosocial functioning from 2011 to 2021.

Authors	**Publication Year**	**Topic**	**Type**	**Journal**	**Country**
Strassel et al.	2011	Dance Therapy	Systematic review	*Alternative Therapies in Health & Medicine*	Netherlands/USA
Burkhardt and Brennan	2012	Recreational dance interventions	Systematic review	*Arts & Health*	UK
Koch et al.	2014	DMT	Meta-analysis	*The Arts in Psychotherapy*	Germany/US
Stueck et al.	2016	Biodanza	Review	*Signum Temporis*	Germany/US
DeJesus et al.	2020	Dance	Systematic review	*Complementary Therapies in Medicine*	Brazil
San-Juan-Ferrer and Hípola	2020	Dance	Systematic review	*Research in Dance Education*	Spain
Sheppard and Broughton	2020	Dance and Music	Systematic review	*International Journal of Qualitative Studies on Health and Well-being*	Australia
Millman et al.	2021	DMT	Systematic review	*Clinical Psychology & Psychotherapy*	UK

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Chris Gilham, PhD, is an Associate Professor in the Faculty of Education at St Francis Xavier University. Chris has been working in education for over 25 years. He taught grades 3 to 9 and was a school board consultant. He enjoys working with others to create, implement, and evaluate practical, school-based mental health programming for educators and students. Chris teaches courses on inclusion, mental health literacy, critical research literacy, and the philosophy of education. He is now researching mental health literacy of educators (SSHRC), and boys-specific groups for developing healthy relationships (supported by Nova Scotia Status of Women).