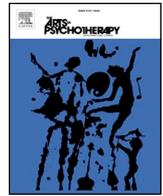




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Research Article

Dance movement therapy with older people with a psychiatric condition: A systematic review

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ABSTRACT

This systematic review assessed the published literature on dance movement therapy interventions with adults aged 60 years and older with a mental health disorder. Our objective was to identify published studies of the effects of DMT in older age psychiatry and to critically appraise methodological quality of the included studies.

We searched the databases CINAHL, MEDLINE, PsycINFO, and PSYINDEX, and Google Scholar. We also searched the reference list of relevant papers in order to identify publications that were not found through the initial database search. The reviewers independently critically appraised all full text articles that met our inclusion criteria. A final 16 studies met the inclusion criteria: nine were primary studies (one randomized controlled trial, three quasi-experimental studies, and five qualitative studies) and seven were secondary studies (systematic reviews). Dementia was the subject in 15 studies, and depression in one, reflecting a possible bias in the literature. The methodological quality of the primary studies was lower than for the secondary studies.

Introduction

The global population is aging. “Between 2015 and 2050, the proportion of the world’s population over 60 years will nearly double, from 12% to 22%” (World Health Organization (WHO), 2017). As older people form an ever greater proportion of the population, there is a growing imperative to investigate their wellbeing, not only because of the possible benefits in terms of the quality of life (QOL) of the individual, but also in terms of the benefits to their families, their caregivers and a reduction in the economic cost of care (Rechel et al., 2013). Integral to this investigation is a focus on mental health. Approximately 15% of adults aged 60 and over have a mental disorder” (World Health Organization (WHO), 2017). “Mental disorders comprise a broad range of problems, with different symptoms. However, they are generally characterized by some combination of abnormal thoughts, emotions, behaviour and relationships with others. Examples are schizophrenia, depression, intellectual disabilities and disorders due to drug abuse. Most of these disorders can be successfully treated” (World Health Organization (WHO), 2018). The most common mental health conditions in older age are dementia and depression, followed by anxiety disorders and substance abuse (Kinzl, 2013; World Health Organization (WHO), 2017). Comorbidity in this age group is common (Schwartz, 2011). Furthermore, mental health problems are under-identified by

health-care professionals, older adults themselves, and their families (World Health Organization (WHO), 2017).

When referring to current international guidelines, Fenner et al. (2017) concluded that arts therapies seem to be more widely used in the treatment psychiatric populations, and therapeutic effects of art therapy, music therapy and dance movement therapy have been demonstrated for people with severe mental illness.

DMT is defined by the European Association for Dance Movement Therapy as “the therapeutic use of movement to further the emotional, cognitive, physical, spiritual and social integration of the individual. Dance as body movement, creative expression and communication, is the core component of Dance Movement Therapy” (European Association Dance Movement Therapy (EADMT), 2018).

Research in DMT has increased considerably in the last decades as practitioners have come under increasing pressure to evidence their work and interventions (Meekums, 2014). Two meta-analyses (Koch, Kunz, Lykou, & Cruz, 2014; Ritter & Low, 1996) have been published on the effects of DMT on QOL, body image, depression, anxiety and interpersonal outcomes. Cruz and Sabers (1998) reassessed the findings of Ritter and Low (1996) and found that DMT was more effective than Ritter and Low had reported. Koch et al. (2014) meta-analysis found evidence of wide ranging positive effects of DMT. This included a moderate effect size for QOL, and for clinical outcomes (including sub-

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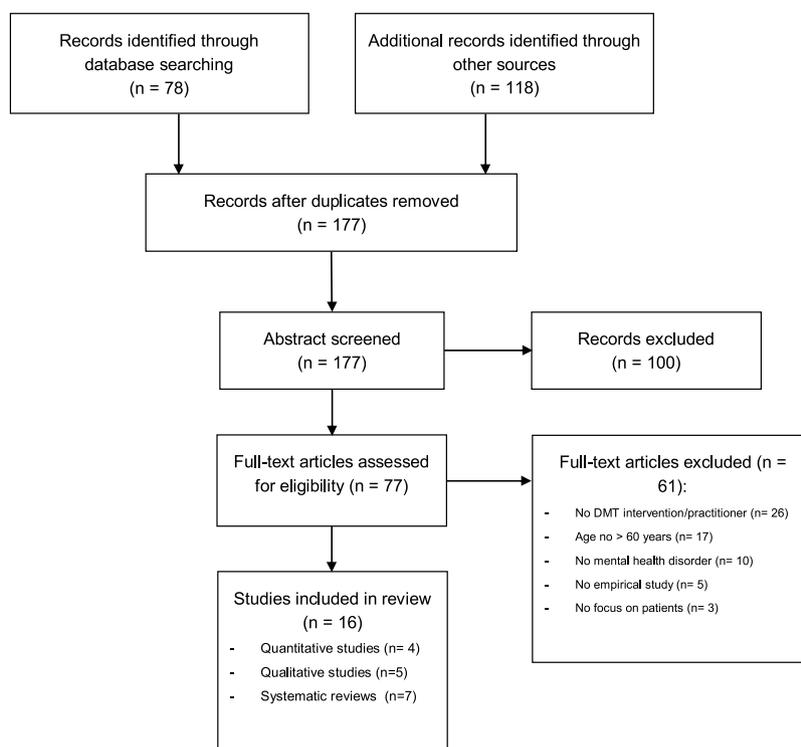


Fig. 1. CONSORT 2010 Flow Diagram.

analyses for depression, anxiety and interpersonal competence). This finding is both consistent with Cruz and Sabers (1998) and more detailed, though the effect on body image was small. Several Cochrane systematic reviews (which focus solely on Randomised Controlled Trials) have examined the application of DMT as a therapeutic treatment for a range of conditions including cancer, dementia, depression and schizophrenia (Bradt, Goodill, & Dileo, 2011; Karkou & Meekums, 2017; Meekums et al., 2015; Ren & Xia, 2013), with varying results.

Some empirical studies (e.g., Hartshorn, Delage, Field, & Olds, 2002) and theoretical works (e.g., Newman-Bluestein & Hill, 2010) have focused on DMT with older adults but not specifically on older people with a psychiatric condition. The literature review by Lelièvre, Tuchowski, and Rolland, (2015) provided an overview of the use of dance with older people as a means to promote social interaction, mobility and QOL and compiled 48 articles published between 2003 and 2014. Thus, records on the effects of dance and DMT with older people exist whereas studies on the effects of DMT interventions with older people who have mental disorders remain scarce.

The aim of this systematic review was to draw together and critically appraise studies on DMT interventions with adults aged over 60, who have mental health disorders. We aimed to assess the current evidence base with regard to possible benefits of DMT in older age psychiatry.

Methods

This methods section addresses eligibility criteria, search strategies, quality of studies, data extraction and data synthesis. Our systematic review focused on different types of evidence therefore we applied several critical appraisal tools in order to integrate a process of appraisal of the research evidence, to assess the methodological quality of the included studies, and to address possible bias in the studies' design, conduct and analysis.

Eligibility criteria for inclusion and exclusion

We applied the PICOS model (population, intervention, comparison, outcome, and study design) (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) to define eligibility criteria. Population: people from 60 years of age with mental disorders (applying to the World Health Organization (WHO), 2017 reference of older people from 60 years on); Intervention: dance movement therapy had to be at least one of the interventions; Comparison: no comparators were required for inclusion in this systematic review; Outcomes: studies that reported patient relevant parameters and patient relevant data; Study types: published empirical studies (quantitative and qualitative) or systematic reviews. Articles written in English, French, German, or Spanish were included.

We excluded studies that evaluated dance inventions without involvement of a qualified dance movement therapist. We further excluded studies on expert opinions, literature reviews that were not systematically conducted, and grey literature.

Search strategy

We performed a systematic search to identify published empirical studies (qualitative and quantitative) as well as systematic reviews using the electronic databases CINAHL with Full Text, MEDLINE, PsycINFO, and PSYINDEX. The search was performed in November 2017 using a combination of three term groups relating to: a. intervention dance movement therapy, b. age, and c. mental disorder (see Appendix). In addition, we searched references in Google Scholar and hand-searched the reference list of relevant papers in order to identify publications that were not found through the initial database search. Additional relevant papers thus obtained were also searched to identify further publications (sometimes referred to as snowballing). All records were handled with Zotero reference manager software. The four databases combined revealed 78 results, reduced to 59 after discarding duplicated records. Additionally, 118 records were identified through other sources consisting of manual searching, and snowballing. A total of 177 unique records were obtained. Titles and abstracts of identified

publications were screened and the first two authors independently assessed whether full text articles met the inclusion criteria (see below for further explanation). Disagreements between the researchers were resolved through discussion and where disagreement persisted, the third author was consulted. Of these 177 records, 100 were excluded at the abstract stage because they did not meet inclusion criteria, and 77 full-text articles were assessed for eligibility. A final compilation of 16 studies was included in the review (see Fig. 1).

Quality of studies and data extraction

Critical appraisal tool

Our systematic review focused on different types of evidence, therefore several critical appraisal tools were applied. All tools were developed by the Joanna Briggs Institute. For systematic reviews we used the Checklist for Systematic Reviews (Aromataris et al., 2015), for the randomized controlled-trials we used the Checklist for Randomized Controlled Trials (Tufanaru, Munn, Aromataris, Campbell, & Hopp, 2017), for intervention studies without randomization or without control we used the Checklist for Quasi-Experimental Studies (non-randomized experimental studies) (Tufanaru et al., 2017), for qualitative studies we used the Checklist for Qualitative Research (Lockwood, Munn, & Porritt, 2015), and for case studies we used the Checklist for Case Reports (Moola et al., 2017).

Data extraction

Two reviewers (first and second authors) independently screened potentially relevant studies based on titles and abstracts. Relevant studies were read in full and included in the systematic review-analysis according to the eligibility criteria. All three authors were involved for data extraction regarding the quality of studies. The primary reviewer (second author) critically appraised all included studies. Two authors functioned as secondary reviewers: the first author critically appraised the qualitative studies and two systematic reviews, and the third author critically appraised the quantitative studies and five systematic reviews. Disagreements were resolved by consensus, where necessary involving the other author in discussions.

Results

Included studies

The final results include 16 articles that are summarized in Tables 1–3 depending on the type of study. In these tables, we have included additional characteristics from the original papers and from our critical appraisal process that were considered to be important.

Tables 1 and 2 show a total of nine primary studies; Table 3 shows seven secondary studies. The studies incorporated the following designs: four quantitative studies (a randomized controlled-trial: Hokkanen et al., 2008; three quasi-experimental studies: Barnes et al., 2015; Dayanim, 2009; Wilkinson, Srikumar, Shaw, & Orrell, 1998); two qualitative studies (Nyström & Lauritzen, 2005; Wu et al., 2015); three case studies (Hill, 2009; Kowarzik, 2013; Sandel, 1978), six systematic reviews (Beard, 2011; Guzmán-García et al., 2012; Karkou & Meekums, 2017; Kiepe, Stöckigt, & Keil, 2012; Schmitt & Frölich, 2007; Strassel, Cherkin, Steuten, Sherman, & Vrijhoef, 2011), and one systematic review and meta-analysis (Koch et al., 2014).

Across all three tables, the 16 studies' general characteristics are presented including: author/s, year, type of study, number of participants, intervention, diagnosis, results, main conclusion by authors; and characteristics specific to study designs. Table 1 furthermore presents results from primary quantitative studies (randomized controlled trials and quasi-experimental studies) regarding mean age and standard deviation, multiple measurements of outcomes at pre- and post-tests, follow-up completion and strategies to deal with loss to follow-up, similarities in comparison of outcomes of participants, use of appropriate

Table 1
Primary Quantitative Studies.

Author/s	Year	Type of study	N	Approach	Diagnosis	Results	Main conclusion by authors	Pre-test, post-test multiple measurements?	Follow-up complete?	Outcomes measured in the same way for all groups compared?	Appropriate statistical analysis?	True randomization used?
Barnes et al.	2015	Controlled cross-over clinical trial Mean age (SD): IG = Intervention group; CG = Control Group (if available)	10	PLIÉ (DMT)	Dementia	No statistically significant effects reported	Potential for improvement in QoL, physical and cognitive functions in people who suffer mild to moderate dementia. May reduce caregiver burden	Yes	No	Yes	Yes	N/A
Dayanim	2009	Non-randomized controlled study IG (n = 22) 79	22	DMT	Dementia	Immediate acute short term effects on memory recall of patients with late-stage Alzheimer's dementia (AD)	Intervention can help mentally organize patients with AD. It may increase communication between patients and their caregivers/family	Yes	Yes	Yes	Unclear	N/A
Hokkanen et al.	2008	Randomized controlled study IG (n = 19) 79.9 (7.7) CG (n = 10) 84.5 (3.4)	29	DMT	Dementia	No effect on social competence, small improvement in cognition and self-care abilities	Suggestion of DMT as a treatment for people who suffer from dementia	Yes	Unclear	Yes	Yes	Unclear
Wilkinson et al.	1998	Non-randomized control study IG (n = 9) 79.6 CG (n = 7) 80.	15	Drama & Movement Therapy	Dementia	Improvement in socialization, memory recall and more positive outlook in life. No	Improvement in QoL by stimulating and maintaining social skills, independence, self-esteem and self-belief	Yes	No	Yes	Yes	N/A

(continued on next page)

Table 1 (continued)

Author/s	Year	Type of study	N	Approach	Diagnosis	Results	Main conclusion by authors	Pre-test, post-test multiple measurements?	Follow-up complete?	Outcomes measured in the same way for all groups compared?	Appropriate statistical analysis?	True randomization used?
		Mean age (SD): IG = Intervention group; CG = Control Group (if available)										
						statistically significant effects reported						

Table 2

Primary Qualitative and Case Studies.

Author/s	Year	Type of study	N	Approach	Diagnosis	Results	Main conclusion by authors	Were patient's demographic characteristics clearly described?	Was the patient's history clearly described and presented as a timeline?	Was the intervention(s) or treatment procedure(s) clearly described?	Are participants, and their voices, adequately represented?	Does the case report provide takeaway lessons?
Hill	2009	Case study with clinical vignettes	1	DT	Dementia	Improvement in self-esteem, confidence and connection to positive feelings	DMT offers a space where the fragmented self can find acceptance, holding and coherence	No	No	Yes	N/A	Yes
Kowarzik	2013	Pilot study	6	DMT	Dementia	Partly increase of verbal communication and expression	Suggestion of DMT may be an approach that stimulates care environment	No	No	No	N/A	No
Nyström & Lauritzen	2005	Qualitative study	7	DT	Dementia	DT enables communication in people who suffer from dementia	The focus on interaction through embodied experiences would help to identify patient's capacities	No	No	Yes	Yes	Yes
Sandel	1978	Case study	15	DMT	Depression	Improvement in socialization and expression of feelings	Sessions appeared to be helpful for patients, but it also stimulated staff	No	No	Yes	N/A	Yes
Wu et al.	2015	Qualitative analysis of a	11	PLIÉ (DMT)	Dementia	Functional, emotional and social changes, including greater behavioural	Positive effects of PLIÉ (DMT), may delay cognitive decline and	Yes	No	Yes	Yes	Yes

(continued on next page)

Table 2 (continued)

Author/s	Year	Type of study	N	Approach	Diagnosis	Results	Main conclusion by authors	Were patient's demographic characteristics clearly described?	Was the patient's history clearly described and presented as a timeline?	Was the intervention(s) or treatment procedure(s) clearly described?	Are participants, and their voices, adequately represented?	Does the case report provide takeaway lessons?
		controlled cross-over clinical trial				coherence and improvement in wellbeing	improve the QoL for patients and their caregivers					

statistical analysis, and true randomization for participants' assignment to groups. Table 2 presents results from primary qualitative and case studies with regard to clear description of patients' demographic characteristics, histories, interventions, patients' voices, and if the study provided takeaway lessons. Table 3 includes critical appraisal of systematic reviews' qualities in relation to appropriate search strategy and inclusion criteria, adequate sources-resources, inclusion of two or more reviewers, and appropriate specific directives for new research.

Study characteristics

Patients

The majority of studies relate to older people who have dementia, except for one that focuses on depression (Sandel, 1978). This suggests a bias in the literature despite the fact that depression affects approximately 7% of the world's older population as compare with the 5% who are diagnosed with dementia (World Health Organization (WHO), 2017).

Interventions

Even though the included studies used approaches that were differently named (DMT, dance therapy, dance, drama and movement therapy, music therapy, and PLIÉ), their interventions included DMT and were carried out or supervised by a dance movement therapist.

Comparison

No comparators were required for inclusion in this systematic review.

Results regarding primary quantitative studies (Table 1): The following four primary quantitative studies are included in the critical appraisal (Table1): Barnes et al. (2015) used as the pre- and post-test evaluation standardized valid and reliable assessments at baseline, at week 18 (cross-over) and at week 36 by trained research assistants who had been blinded to group assignment. The statistical analysis was appropriately conducted, with the most relevant results in the within-group, before and after difference comparison, expressed as an effect size. Dayanim (2009) conducted multiple measurements with participants: during meal time the pre-test was administered between one and three times based on patient's availability. The post-test was re-administered 20 min later. The follow-up test was appropriate to the client group. All outcome tests were measured in the same way and included only two questions to avoid passage of time factors, as the patients' ability to focus was extremely limited. Appropriate statistical tests were applied, given that there was no control group (correlational analyses, repeated measures, t- test). However, no information regarding the number of participants in each group at pre- and post-tests was provided.

Hokkanen et al. (2008) used for the pre- and post-test evaluation standardized valid and reliable assessments which they administered at five time points to both groups: two pre-tests, a test at week five, the post-test at week nine, and a follow-up test at week 13. Results of standardized instruments however were incompletely reported and no information was given on attrition rates and how this was dealt with statistically. The issues related to multiple tests were managed in an appropriate manner, as the authors used MANOVA. The method for randomization was not stated, therefore it remains unclear if true randomization was used to assign participants to treatment groups.

Wilkinson et al. (1998) also used for the pre-test and post-test evaluation standardized valid and reliable assessments, and post-test was administered after 12 weeks. One of the controls died before they could be followed up and was omitted from analysis (as opposed to any use of an Intention to-treat analysis, which would have improved the quality). No other information was given on attrition or how this was dealt with. Appropriate statistical analysis was conducted with the Mann Whitney U test comparing pre-test and post-test scores across each of the scales for both of the groups.

Table 3
Systematic Reviews.

Author/s	Year	Type of study	Included Studies	Approach	Diagnosis	Results	Main conclusion by authors	Appropriate search strategy	Adequate sources-resources	Appropriate inclusion criteria	Two or more reviewers	Appropriate specific directives for new research
Beard	2011	Systematic Review	Nyström & Lauritzen (2005)	DT	Dementia	Increase of communication	Need for more systematic AT studies in the field of dementia	Yes	No	Unclear	No	Yes
Guzmán-García et al.	2012	Systematic review	Hokkanen et al. (2008); Nyström & Lauritzen (2005)	DMT & DT	Dementia	Improvement of mood, cognition, communication and socialising	Inconclusive dance work evidence in care homes	Yes	Yes	Yes	Unclear	Yes
Karkou & Meekums	2017	Cochrane Systematic review	Beard (2011); Hill (2009); Hokkanen et al. (2008); Wilkinson et al. (1998)	DMT	Dementia	No final studies were included in this review	Need for trials of high methodological quality, large sample sizes and clear description of intervention	Yes	Yes	N/a	Yes	Yes
Kiepe et al.	2012	Systematic review	Hokkanen et al. (2008)	DMT	Dementia	Inconclusive results	DMT seems to improve mental and physical conditions	Yes	No	Unclear	Yes	Yes
Koch et al.	2014	Systematic Review & meta-analysis	Hokkanen et al. (2008)	DMT	Dementia	DMT as effective evidence-based intervention for elderly with depression and dementia	DMT as an effective and useful treatment in clinical and prevention contexts	Yes	Yes	Yes	Yes	Yes
Schmitt & Frölich	2007	Systematic review	Wilkinson et al. (1998)	DT	Dementia	No statistically significant effects reported	AT are recommended to improve interaction and expressiveness	No	No	N/a	N/a	Yes
Strassel et al.	2011	Systematic review	Schmitt & Frölich (2007); Hokkanen et al. (2008)	DT	Dementia	Inconclusive results	Poor empirical evidence, but DT may be potencial for wide-reaching physical/psychological benefits	Yes	No	Yes	Yes	Yes

AT, Art Therapies; DT, Dance Therapy; DMT, Dance Movement Therapy.

Table 4
Systematic reviews' results from critical appraisal.

Author/s	Year	Type of study	Answers to Critical appraisal				Total	Yes %
			Yes	No	Unclear	N/a		
Beard	2011	Systematic review	6	4	1	–	11	55
Guzmán-García et al.	2012	Systematic review	9	1	1	–	11	82
Karkou & Meekums	2017	Cochrane systematic review	9	–	–	2	11	82
Kiepe et al.	2012	Systematic review	8	2	1	–	11	73
Koch et al.	2014	Systematic review & meta-analysis	11	–	–	–	11	100
Schmitt & Frölich	2007	Systematic review	4	4	–	3	11	36
Strassel et al.	2011	Systematic review	9	2	–	–	11	82

Results regarding primary qualitative and case studies (Table 2): All five included articles (Hill, 2009; Kowarzik, 2013; Nyström & Lauritzen, 2005; Sandel, 1978; Wu et al., 2015) made a clear statement of the aims as well as the outcomes of their studies. In all cases, qualitative research seemed to be an appropriate methodological approach for addressing the research goal. The recruitment strategy was not explained in detail in any of the studies. Potential bias from researcher, therapist or staff involved in the DMT sessions was considered by only two articles (Nyström & Lauritzen, 2005; Wu et al., 2015), even though it has been claimed that “qualitative research is particularly subject to researcher bias” (Berrol, 2000, p. 42). Data analysis procedures were not fully described in all of the included studies. For example, in some cases there was a lack of in-depth description of the analysis process or how the data presented were selected from the original sample to demonstrate the analysis process. Video records of at least some sessions, and their corresponding transcription were used by all studies except for Sandel (1978), which focused on depressive patients. Interviews with participants were not carried out in any of the studies.

Hill (2009) presented not a pure case study but clinical vignettes of the first DMT session (out of four DMT sessions) with an elderly woman, therefore no clear description of demographic characteristics could have been expected.

Four take away lessons have been described in two studies: The first is that demented participants seem initially to need the therapist's initiatives as a ‘warming-up’ in the joint group activities, to be able go on to more individual initiatives directed to other participants. The second is that to sing and dance, despite older age, even if this is done in a more modest way, can be a way to express embodied experiences and to facilitate communication with others (Nyström & Lauritzen, 2005). The third is that the movement therapy sessions appear to be helpful for patients by providing a structured opportunity for contact, for the sharing of life experiences and memories, and for the appropriate expression of aggression. The last take away lesson is that in addition to the value of the sessions themselves, the increase in patients' socialization stimulated staff's interest in expanding the program of creative, process-oriented group activities (Sandel, 1978).

Results regarding systematic reviews (Table 3): Beard (2011) and Schmitt and Frölich (2007) gathered literature related to the effects of creative arts therapies in general for dementia patients. Strassel et al. (2011) focused on any intervention using dance as a therapeutic tool with no special target group. Guzmán-García, Hughes, James, and Rochester, (2012) focused on peer-reviewed articles relating to dancing styles carried out in care homes for people with dementia. Kiepe et al. (2012) concentrated on randomized controlled trials in order to evaluate the effects of DMT and ballroom dances as therapeutic interventions with patients over 14 years old who have physical or mental illnesses, including also elderly patients. Koch et al. (2014), looked for quantitative data from DMT, creative movement or dance interventions on health-related psychological outcomes with no age restriction but also identified those studies that focused on older people. Finally, Karkou and Meekums (2017) carried a Cochrane systematic review

considering randomized controlled trials in any language that included people with dementia who received interventions by a qualified dance movement therapy practitioner.

The majority of the systematic reviews used an appropriate search strategy except for Schmitt and Frölich (2007) who do not mention languages that are included, no explanation is given about why only studies with three or more participants are included. There is no evidence of subject headings and indexing terms been used in the conduct of the search, and although the authors state they look for creative therapies, they also include active dances. Sources and resources used to search for studies were adequate in only three of the systematic reviews (Guzmán-García et al., 2012; Karkou & Meekums, 2017; Koch et al., 2014). A range of different tools, from questionnaires to checklists on how to assess quantitative/qualitative data, used for grading papers, have been reported (Guzmán-García et al., 2012; Kiepe et al., 2012; Strassel et al., 2011). Koch et al. (2014) highlighted the lack of consensus on the best procedure and correctly explained the reasons why they did not use any appraisal tool in their meta-analysis. The criteria for appraising studies were appropriate in three articles (Guzmán-García et al., 2012; Koch et al., 2014 and Strassel et al., 2011). This was not applicable for Karkou and Meekums (2017) as no studies were included in their review, and it was not applicable for Schmitt and Frölich (2007) because no critical appraisal was conducted to assess the included studies. Beard (2011) and Kiepe et al. (2012) are unclear about the criteria used for appraising studies. A critical appraisal was conducted by two or more reviewers independently in the majority of the articles (Kiepe et al., 2012; Koch et al., 2014 and Strassel et al., 2011). Finally, specific directives for new research were indicated appropriately by all the systematic reviews.

Quality of the included studies (Tables 4 and 5): After applying the provided checklists to appraise the methodological quality of the included studies, we assessed the obtained results taking into consideration three different bands. Due to the lack of consistent literature on how to evaluate the obtained responses, we decided to use the following values. More than 80% of affirmative responses “yes” was considered high quality, between 50 and 79% was considered moderate quality and less than 50% low quality.

Methodological quality in four out of seven systematic reviews was high, moderate in two systematic reviews and low in one; methodological quality in quantitative primary studies was moderate in two out of four, and low in two studies; and in qualitative studies, methodological quality was high in two out of five studies, whereas the remainder was low.

Excluded studies

A total of 161 studies did not meet the inclusion criteria of which 100 were already excluded after abstracts had been screened and a further 61 after full texts had been assessed. The first two authors excluded 100 of these at the first phase of assessment, based on reading the article abstracts. They read and appraised the full paper for the other 61 excluded articles. The main reason for exclusion was that the

Table 5
Primary studies results from critical appraisal.

	Author/s	Year	Type of study	Answers to Critical appraisal				Total	% Yes
				Yes	No	Unclear	N/a		
Quantitative studies	Barnes et al.	2015	Quasi-experimental study	7	1	1	–	9	78
	Dayanim	2009	Quasi-experimental study	5	1	3	–	9	56
	Hokkanen et al.	2008	Randomized controlled-trial	6	2	5	–	13	46
	Wilkinson et al.	1998	Quasi-experimental study	4	3	2	–	9	44
Qualitative studies/Case studies	Hill	2009	Case study	2	5	–	1	8	25
	Kowarzik	2013	Case study	–	8	–	–	8	0
	Nyström & Lauritzen	2005	Qualitative study	8	2	–	–	10	80
	Sandel	1978	Case study	3	3	1	1	8	38
	Wu et al.	2015	Qualitative study	8	1	1	–	10	80

studies did not include DMT interventions or DMT practitioners (e.g., Abreu & Hartley, 2013; Behrman & Ebmeier, 2014; Duignan, Hedley, & Milverton, 2008; Krampe et al., 2014; Hamill, Smith, & Röhrlich, 2011; Murrock & Graor, 2016; Quiroga Murcia & Kreutz, 2012; Vanková et al., 2014). The second reason for exclusion was that mean age was not reported (e.g., Hokkanen et al., 2003; Schmitt, 2011) or was less than 60 years old (e.g., Mala, Karkou, & Meekums, 2012). Other reasons for exclusion were that no psychiatric illness was specified or applied (e.g., Hartshorn et al., 2002; Krampe et al., 2014; Meekums, 1996; Ritter & Low, 1996), the articles were not-peer-reviewed (e.g., Falke-Laser, 1989; Samberg, 1988) or did not focus on patients' experience but on their caregivers, e.g., family, staff working at the nursing home or therapists (2015, Bräuninger, 2014; Melhuish, Beuzebec, & Guzmán, 2015). Lelièvre et al. (2015) was excluded because the study claimed to be a systematic review but was not.

Discussion

The aim of this systematic review was to compile the available published peer-reviewed primary and secondary studies related to DMT interventions with people aged over 60 who have any mental health disorder in order to review, appraise and synthesize the results. Seventeen studies were identified that met the inclusion criteria: four quantitative studies, five qualitative studies and seven systematic reviews, including one meta-analysis. Even though studies used different terms to describe their approach (DMT, dance, dance therapy, drama and movement therapy, music therapy and PLIÉ), their interventions included DMT interventions which corresponded to our inclusion criteria.

Six of the 16 studies recommend DMT based intervention as a therapeutic approach to improve interaction between caregivers, family members and people who have dementia (Barnes et al., 2015; Guzmán-García et al., 2012; Kowarzik, 2013; Nyström & Lauritzen, 2005; Schmitt & Frölich, 2007; Wu et al., 2015). A systematic review and meta-analysis carried out by Koch et al. (2014) supports the claim that DMT is an effective and useful treatment method in clinical and prevention contexts, with a moderate effect size for QOL, depression, anxiety and interpersonal competence, and a small effect size for body image, though these results are not sub-analysed for older people with mental health issues.

The majority of the included studies reported that the intervention improved QOL (Barnes et al., 2015; Wilkinson et al., 1998; Wu et al., 2015), communication (Guzmán-García et al., 2012; Kowarzik, 2013; Sandel, 1978; Schmitt & Frölich, 2007; Wilkinson et al., 1998) and social interaction (Guzmán-García et al., 2012; Schmitt & Frölich, 2007; Wilkinson et al., 1998; Wu et al., 2015), as well as other observed benefits. Although several studies did not report any significant changes or did not control for multiple testing, the authors claimed that positive general effects were shown (Barnes et al., 2015; Hokkanen et al., 2008; Wilkinson et al., 1998). Barnes et al. (2015) suggest that DMT seems to have a potential for improving QOL, physical and cognitive functions in

people who have mild to moderate dementia. However, their results did not reach statistical significance. An included Cochrane systematic review of DMT for dementia revealed that there was no evidence for or against DMT as a useful intervention, due to a lack of randomized controlled trials studies (Karkou & Meekums, 2017). Also, the Cochrane Review protocol on depression (Meekums, Karkou, & Nelson, 2015) showed that no studies met the inclusion criteria and addressed the older population. We found insufficient evidence to justify some of the claims made concerning benefits of DMT. Larger randomized controlled trials of DMT for people with dementia and older people are clearly needed.

We have identified certain empirical weaknesses in our included studies, which in turn limit the findings in this report: 1) In several instances the research design was not explicitly stated. 2) Often, the methodology of the studies was not clearly described, for example: a lack of clearly articulated coding system to support the observation; no existence of clinical notes that have been taken consistently and systematically; missed recording of the observation, which is the ultimate tool in science (Cruz & Berrol, 2012). 3) Some articles lacked a systematic discussion of their data analysis procedures. 4) All of the studies have small sample sizes (from one to 29). The small samples undermine the external validity of these studies and limit the possibility that their findings can be generalized. The need for further research with larger number of participants has been identified in previous analyses (Barnes et al., 2015; Dayanim, 2009; Karkou & Meekums, 2017; Kiepe et al., 2012). Future investigations of a similar nature might benefit from power calculations in their design. 5) There are a lack of studies undertaking follow-up analyses in the months following the intervention.

This review also highlights a number of broader limitations with the emergent literature in this area. The first of these is the relative scarcity of empirical studies of DMT interventions with this population. Both quantity and quality of research on DMT is limited. However, recent efforts in DMT research in general have resulted in improvements in methodology.

A second limitation concerns an overwhelming focus in the DMT literature to date on older adults with dementia. Despite the fact that several psychiatric conditions can be identified in older people (Schwartz, 2011), our included studies relate to participants who have dementia, except for one (Sandel, 1978). It could be argued that more attention should be given to depression in older adults due to the vital changes that usually are intrinsic to this last stage in life, such as retirement, loss of loved ones, deterioration of cognitive and physical faculties, etc. Furthermore, history of depression is a risk factor for dementia in later life (Almeida, Hankey, Yeap, Golledge, & Flicker, 2016), therefore we would recommend efficacy studies in the field of DMT and depression in older age.

Third, the development of further mixed methods studies in this field, which integrate quantitative and qualitative analysis, would be likely to enrich the literature (Bräuninger, 2014; Melhuish et al., 2015; Strassel et al., 2011). Previous research (Bräuninger, 2014), indicates that distinctive therapeutic qualities and specific DMT interventions are

required to work with this population. Qualitative methods would be required to capture this aspect, whereas quantitative methods would be required to assess intervention outcomes.

Limitations and conclusion

One major limitation of this systematic review is the inclusion of various study types that reported patient relevant parameters and patient relevant data, namely quantitative and qualitative studies as primary research bases as well as systematic reviews as secondary studies. Most of the primary studies were included in the secondary studies. A second limitation may be the language restriction to only include articles written in English, French, German, or Spanish, thereby excluding potential other relevant research published in other languages, and no grey literature, plus a limited (though targeted) number of databases.

There exists an extensive body of research on DMT and older adults, which has grown in the last years. There remains however a number of gaps in and limitations to this research field of DMT. This review identifies efficacy studies of DMT with older adults with a range of psychiatric conditions including depression as one of these gaps. A limitation within the field is that studies are often characterised by a number of methodological limitations resulting in a lack of high quality studies. It is beyond the scope of this article to hypothesise the reasons for this situation. However, if DMT is to be included as a mainstream therapeutic treatment with older adults who have a psychiatric condition, it is important to think about different solutions to the challenges of initiating more research in the field. One possible solution might be that international teams of dance movement therapists and researchers of related fields work more closely together in order to develop a more robust evidence base (Meekums, 2010, 2014).

Conflicts of interest

While recognising issues of possible bias, we have sought to address these through rigorous methods including the consistent application of established appraisal tools.

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Appendix A. Supplementary data

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References

Abreu, M., & Hartley, G. (2013). The effects of Salsa dance on balance, gait, and fall risk in a sedentary patient with Alzheimer's dementia, multiple comorbidities, and recurrent falls. *Journal Of Geriatric Physical Therapy (2001)*, *36*, 100–108. <https://doi.org/10.1519/JPT.0b013e318267aa54>.

Almeida, O. P., Hankey, G. J., Yeap, B. B., Gollidge, J., & Flicker, L. (2016). Depression as a risk factor for cognitive impairment in later life: The health in men cohort study. *International Journal of Geriatric Psychiatry*, *31*, 412–420. <https://doi.org/10.1002/gps.4347>.

Aromataris, E., Fernández, R., Godfrey, C., Holly, C., Kahilil, H., & Tungpunkom, P. (2015). Summarizing systematic reviews: Methodological development, conduct and reporting of an umbrella review approach. *International Journal of Evidence-Based Healthcare*, *13*, 132–140. <https://doi.org/10.1097/XEB.0000000000000055>.

Barnes, D. E., Mehling, W., Wu, E., Beristianos, M., Yaffe, K., Skultety, K., et al. (2015). Preventing loss of independence through exercise (PLIE): A pilot clinical trial in older adults with dementia. *PLoS One*, *10*, e0113367.

Beard, R. L. (2011). Art therapies and dementia care: A systematic review. *Dementia*, *11*, 633–656.

Behrman, S., & Ebmeier, K. P. (2014). Can exercise prevent cognitive decline? *The Practitioner*, *258(1767)*, 17–21 2-3.

Berrol, C. F. (2000). The spectrum of research options in dance/movement therapy. *American Journal of Dance Therapy*, *22*, 29–46. <https://doi.org/10.1023/A:100551840>.

Bradt, J., Goodill, S. W., & Dileo, C. (2011). Dance/movement therapy for improving psychological and physical outcomes in cancer patients. *The Cochrane Database of Systematic Reviews*, *10*, CD007103. <https://doi.org/10.1002/14651858.CD007103.pub2>.

Bräuninger, I. (2014). Dance movement therapy with the elderly: An international internet-based survey undertaken with practitioners. *Body, Movement, and Dance in Psychotherapy*, *9*, 138–153. <https://doi.org/10.1080/17432979.2014.914977>.

Bräuninger, I. (2015). Tanz-, und Bewegungstherapie im Alter [Dance and movement therapy in ageing]. In R. Lindner, & J. Hummel (Eds.). *Psychotherapie in der Geriatrie: Aktuelle psychodynamische und verhaltenstherapeutische Ansätze [Psychotherapy in geriatrics: current psychodynamic and behavioral approaches]* (pp. 173–184). Stuttgart: Kohlhammer.

Cruz, R. F., & Berrol, C. F. (Eds.). (2012). *Dance/movement therapists in action: A working guide to research options* (2nd ed.). Springfield, IL: Charles C. Thomas Publisher.

Cruz, R. F., & Sabers, D. L. (1998). Dance/movement therapy is more effective than previously reported. *The Arts in Psychotherapy*, *25*, 101–104. [https://doi.org/10.1016/S0197-4556\(98\)00015-X](https://doi.org/10.1016/S0197-4556(98)00015-X).

Dayanim, S. (2009). The acute effects of a specialized movement program on the verbal abilities of patients with late-stage dementia. *Alzheimer's Care Today*, *10*, 93–98. <https://doi.org/10.1097/ACQ.0b013e3181a410ab>.

Duignan, D., Hedley, L., & Milverton, R. (2008). Exploring dance as a therapy for symptoms and social interaction in a dementia care unit. *Nursing Times*, *105*, 19–22.

European Association Dance Movement Therapy (EADMT) (2018). *What is dance movement therapy?* Retrieved from <http://www.eadmt.com/?action=article&id=22>.

Falke-Laser, B. (1989). Sport- und Bewegungstherapie [Sport and movement therapy]. In M. Bergener (Ed.). *Depressive Syndrome im Alter. Theorie, Klinik, Praxis [Depressions in ageing. Theory, clinic, practice]* (pp. 216–221). Stuttgart: Thieme.

Fenner, P., Abdelazim, R. S., Bräuninger, I., Strehlow, G., & Seifert, K. (2017). Provision of arts therapies for people with severe mental illness. *Current Opinion in Psychiatry*, *30*, 306–311. <https://doi.org/10.1097/YCO.0000000000000338>.

Guzmán-García, A., Hughes, J. C., James, I. A., & Rochester, L. (2012). Dancing as a psychosocial intervention in care homes: A systematic review of the literature. *International Journal of Geriatric Psychiatry*, *28*, 914–924. <https://doi.org/10.1002/gps.3913>.

Hamill, M., Smith, L., & Röhrich, F. (2011). 'Dancing down memory lane': Circle dancing as a psychotherapeutic intervention in dementia—A pilot study. *Dementia*, *11*, 709–724. <https://doi.org/10.1177/1471301211420509>.

Hartshorn, K., Delage, J., Field, T., & Olds, L. (2002). Senior citizens benefit from movement therapy. *Journal of Bodywork and Movement Therapies*, *6*, 55–58. <https://doi.org/10.1054/jbmt.2001.0229>.

Hill, H. (2009). Dancing with hope. Dance therapy with people with dementia. In S. Chaiklin, & H. Wengrower (Eds.). *The art and science of dance/movement therapy: Life is dance* (pp. 181–194). (1st ed.). New York, NY: Routledge.

Hokkanen, L., Rantala, L., Remes, A. M., Härkönen, B., Viramo, P., & Winblad, I. (2003). Dance/movement therapeutic methods in management of dementia. *Journal of the American Geriatrics Society*, *51*, 576–577. <https://doi.org/10.1046/j.1532-5415.2003.51175.x>.

Hokkanen, L., Rantala, L., Remes, A. M., Härkönen, B., Viramo, P., & Winblad, I. (2008). Dance and movement therapeutic methods in management of dementia: A randomized, controlled study. *Journal of the American Geriatrics Society*, *56*, 771–772. <https://doi.org/10.1111/j.1532-5415.2008.01611.x>.

Karkou, V., & Meekums, B. (2017). Dance movement therapy for dementia (Review). *The Cochrane Database of Systematic Reviews*, *3*, CD011022. <https://doi.org/10.1002/14651858.CD011022.pub2>.

Kiepe, M.-S., Stöckigt, B., & Keil, T. (2012). Effects of dance therapy and ballroom dances on physical and mental illnesses: A systematic review. *The Arts in Psychotherapy*, *39*, 404–411. <https://doi.org/10.1016/j.aip.2012.06.001>.

Kinzl, J. F. (2013). Psychische Erkrankungen bei Frauen und Männern im Alter [Mental illnesses in women and men in old age]. *Zeitschrift für Gerontologie und Geriatrie*, *46*, 526–531. <https://doi.org/10.1007/s00391-013-0527-3>.

Koch, S., Kunz, T., Lykou, S., & Cruz, R. (2014). Effects of dance movement therapy and dance on health-related psychological outcomes: A meta-analysis. *The Arts in Psychotherapy*, *41*, 46–64. <https://doi.org/10.1016/j.aip.2013.10.004>.

Kowarzik, U. (2013). Opening doors: Dance movement therapy with people with dementia. In H. Payne (Ed.). *Dance movement therapy: Theory, research and practice* (pp. 17–30). (3rd ed.). London: Routledge.

Krampe, J., Wagner, J. M., Hawthorne, K., Sanazaro, D., Choochart, W. A., Budhathoki, C., et al. (2014). Does dance-based therapy increase gait speed in older adults with chronic lower extremity pain: A feasibility study. *Geriatric Nursing*, *35*, 339–344. <https://doi.org/10.1016/j.gerinurse.2014.03.008>.

Lelièvre, A., Tuchowski, F., & Rolland, Y. (2015). La danse, une thérapie pour la personne âgée. *Revue de la littérature. Les Cahiers de L'année Gérontologique*, *7*, 177–187. <https://doi.org/10.1007/s12612-015-0471-5>.

Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: Methodological guidance for systematic reviewers utilizing meta-aggregation. *International Journal of Evidence-based Healthcare*, *13*, 179–187. <https://doi.org/10.1097/XEB.0000000000000062>.

Mala, A., Karkou, V., & Meekums, B. (2012). Dance/movement therapy (D/MT) for depression: A scoping review. *The Arts in Psychotherapy*, *39*, 287–295. <https://doi.org/10.1016/j.aip.2012.04.002>.

Meekums, B. (1996). Dance movement therapy: A group therapy approach for older people with mental health problems. In L. Matthew (Ed.). *Professional care for the elderly mentally ill* (pp. 119–136). Dordrecht: Springer. https://doi.org/10.1007/978-1-4899-3015-6_7.

Meekums, B. (2010). Moving towards evidence for dance movement therapy: Robin Hood in dialogue with the King. *The Arts in Psychotherapy*, *37*, 35–41. <https://doi.org/10.1002/14651858.CD011022.pub2>.

- 1016/j.aip.2009.10.001.
- Meekums, B. (2014). Becoming visible as a profession in a climate of competitiveness: The role of research. *Body, Movement, and Dance in Psychotherapy*, 9, 123–137. <https://doi.org/10.1080/17432979.2014.885912>.
- Meekums, B., Karkou, V., & Nelson, E. A. (2015). Dance movement therapy for depression (Protocol). *The Cochrane Database of Systematic Reviews*, 2, CD009895. <https://doi.org/10.1002/14651858.CD009895.pub2>.
- Melhuish, R., Beuzeboc, C., & Guzmán, A. (2015). Developing relationships between care staff and people with dementia through music therapy and dance movement therapy: A preliminary phenomenological study. *Dementia*, 6, 282–296. <https://doi.org/10.1177/1471301215588030>.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6, e1000097. <https://doi.org/10.1371/journal.pmed.1000097>.
- Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., Sfetcu, R., & Mu, P.-F. (2017). Chapter 7: Systematic reviews of etiology and risk. *Joanna Briggs Institute reviewer's manual*. The Joanna Briggs Institute. et al. (eds.), Retrieved from <https://reviewersmanual.joannabriggs.org/>.
- Murrock, C. J., & Graor, C. H. (2016). Depression, social isolation, and the lived experience of dancing in disadvantaged adults. *Archives of Psychiatric Nursing*, 30, 27–34. <https://doi.org/10.1016/j.apnu.2015.10.010>.
- Newman-Bluestein, D., & Hill, H. (2010). Movement as the medium for connection, empathy, playfulness. *Journal of Dementia Care*, 18, 24–27.
- Nyström, K., & Lauritzen, S. (2005). Expressive bodies: Demented persons' communication in a dance therapy context. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness & Medicine*, 9, 297–317. <https://doi.org/10.1177/1363459305052902>.
- Quiroga Murcia, C., & Kreutz, G. (2012). Dance and health: Exploring interactions and implications. In R. A. R. MacDonal, G. Kreutz, & L. Mitchell (Eds.). *Music, health, and well-being* (pp. 125–135). Oxford: Oxford University Press.
- Rechel, B., Grundy, E., Robine, J. M., Cylus, J., Mackenbach, J. P., Knai, C., et al. (2013). Ageing in the European union. *The Lancet*, 381(9874), 1312–1322. [https://doi.org/10.1016/S0140-6736\(12\)62087-X](https://doi.org/10.1016/S0140-6736(12)62087-X).
- Ren, J., & Xia, J. (2013). Dance therapy for schizophrenia. *The Cochrane Database of Systematic Reviews*, 10, CD006868. <https://doi.org/10.1002/14651858.CD006868.pub3>.
- Ritter, M., & Low, K. G. (1996). Effects of dance/movement therapy: A meta-analysis. *The Arts in Psychotherapy*, 23, 249–260. [https://doi.org/10.1016/0197-4556\(96\)00027-5](https://doi.org/10.1016/0197-4556(96)00027-5).
- Samberg, S. (1988). *The arts as psychotherapeutic modalities with groups of older people. Group Psychotherapies for the Elderly*. Madison, CT: International Universities Press 211–222.
- Sandel, S. L. (1978). Movement therapy with geriatric patients in a convalescent home. *Psychiatric Services*, 29, 738–741.
- Schmitt, B. S. (2011). Kreative Therapieansätze 1: Tanztherapie, Kunst- und Theatertherapie [Dance therapy, art and theatre therapy]. In J. Haberstroh, & J. Pantel (Eds.). *Demenz psychosozial behandeln: Psychosoziale Interventionen bei Demenz in Praxis und Forschung [Treatment of dementia psychosocially: Psychosocial interventions in dementia in practice and research]* (pp. 101–114). Heidelberg: Akademische Verlagsgesellschaft Aka.
- Schmitt, B., & Frölich, L. (2007). Kreative Therapieansätze in der Behandlung von Demenzen: eine systematische Übersicht [Creative therapy approaches in the treatment in dementia: a systematic review]. *Fortschritte der Neurologie, Psychiatrie*, 75, 699–707. <https://doi.org/10.1055/s-2006-944298>.
- Schwartz, H. (2011). Psychische Erkrankungen bei alten Menschen [Mental illness in old people]. In G. Höltner (Ed.). *Bewegungstherapie bei psychischen Erkrankungen: Grundlagen und Anwendung [Movement therapy with old people: Fundamentals and applications]* (pp. 526–576). Köln: Deutscher Ärzte-Verlag.
- Strassel, J. K., Cherkin, D. C., Steuten, L., Sherman, K. J., & Vrijhoef, H. J. (2011). A systematic review of the evidence for the effectiveness of dance therapy. *Alternative Therapies in Health and Medicine*, 17, 50–59.
- Tufanaru, C., Munn, Z., Aromataris, E., Campbell, J., & Hopp, L. (2017). Chapter 3: Systematic reviews of effectiveness. In E. Aromataris, & Z. Munn (Eds.). *The Joanna Briggs Institute reviewer's manual* The Joanna Briggs Institute. Retrieved from <https://reviewersmanual.joannabriggs.org/>.
- Vanková, H., Holmerová, I., Machacova, K., Volicer, L., Veleta, P., & Celko, A. M. (2014). The effect of dance on depressive symptoms in nursing home residents. *Journal of the American Medical Directors Association*, 15, 582–587. <https://doi.org/10.1016/j.jamda.2014.04.013>.
- Wilkinson, N., Srikumar, S., Shaw, K., & Orrell, M. (1998). Drama and movement therapy in dementia: A pilot study. *The Arts in Psychotherapy*, 25, 195–201. [https://doi.org/10.1016/S0197-4556\(97\)00102-0](https://doi.org/10.1016/S0197-4556(97)00102-0).
- World Health Organization (WHO) (2017). *Mental health of older adults [Fact sheet]*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs381/en/>.
- World Health Organization (WHO) (2018). *Mental disorders*. Retrieved from http://www.who.int/mental_health/management/en/.
- Wu, E., Barnes, D. E., Ackerman, S. L., Lee, J., Chesney, M., & Mehling, W. E. (2015). Preventing loss of Independence through exercise (PLIÉ): Qualitative analysis of a clinical trial in older adults with dementia. *Aging & Mental Health*, 19, 353–362. <https://doi.org/10.1080/13607863.2014.935290>.