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## Impacts of dance on agitation and anxiety among persons living with dementia: An integrative review

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## ABSTRACT

**Introduction:** Individuals living with dementia are likely to experience one or more neuropsychiatric symptoms on a daily basis. Dance has the potential to positively impact and reduce these symptoms. This integrative review was conducted to identify the impacts of dance on agitation and anxiety among those living with dementia.

**Methods:** An integrative review methodology guided the literature search and evaluation. Thirty-Nine papers were retrieved from the initial search. Five studies were included in the review. The Mixed Methods Appraisal Tool was used to assess the quality of relevant articles.

**Results:** Three quantitative and 2 qualitative studies were reviewed. Three out of 4 studies found dance positively impacted agitation. While 1 out of 2 studies reported improvements in anxiety.

**Discussion:** This review suggests that dance has the potential to impact anxiety and agitation symptoms of persons living with dementia. However, the evidence is weak and further research is warranted.

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## Introduction

Dementia is the most common neurodegenerative disease affecting 50 million people worldwide.<sup>1</sup> In the United States, it is estimated that 5.6 million persons age 65 or older are currently living with dementia.<sup>2</sup> Of those living with dementia, up to 90% are estimated to experience neuropsychiatric symptoms (e.g. anxiety, agitation).<sup>3</sup> Anxiety and agitation are neuropsychiatric symptoms that are of particular concern. Agitation is characterized by pacing, restlessness, repeated vocalizations, and verbal or physical aggressive behavior.<sup>4,5</sup> Anxiety is more difficult to identify as symptoms are often similar to other neuropsychiatric symptoms or the underlying condition of dementia.<sup>6</sup> Anxiety symptoms such as restlessness, fatigue, and worry can occur in persons living with dementia without an actual anxiety diagnosis.<sup>7</sup> Regardless of how it is defined, persons living with dementia that have symptoms of anxiety or agitation have more difficulty with activities of daily living leading to greater functional impairment resulting in early long term care.<sup>4,8</sup> These symptoms are also associated with having poor quality of life<sup>9</sup> and increased

mortality.<sup>10</sup> To manage anxiety and agitation, medications are often being used, which are costly, sometimes ineffective, and potentially harmful.<sup>11–13</sup> Commonly, antipsychotics are prescribed as an off-label treatment to manage agitation.<sup>4</sup> Evidence suggests non-pharmacologic interventions are effective at managing neuropsychiatric symptoms such as anxiety and agitation, and should be considered first before starting pharmacological treatment.<sup>14–16</sup>

Physical activity such as dance is one type of non-pharmacological approach that offers psychological benefits to the person living with dementia. In a systematic review of short-term exercise interventions, there was some evidence that exercise programs are effective at improving agitation for persons with dementia.<sup>17</sup> In a randomized control trial of a 2-week structured exercise program where persons with moderate stage dementia completed four 20-minute sessions per day 3 days per week, there were significant improvements in agitation and other neuropsychiatric symptoms.<sup>18</sup> Similar findings were noted after a 3-week group exercise program for 30 minutes per day.<sup>19</sup> Twenty to 60 minutes of daily activity that is matched to skill level of the person with dementia has been shown to be feasible and beneficial.<sup>20,21</sup>

Managing neuropsychiatric symptoms is complex, and interventions may be most effective using multicomponent approaches. Dance combines cognitive, physical, and social training that is

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thought to be effective for persons with dementia for various reasons such as attention to the music and environment,<sup>22</sup> awareness of others,<sup>23</sup> and the use of large muscle groups.<sup>24</sup> Music has been found to activate specific neural pathways associated with emotion.<sup>25</sup> Dance movements also contribute to positive emotional behaviors among those with dementia.<sup>26</sup> An observational study noted that during group dances, persons with dementia are able to mimic movements and are transformed by the experience often switching from exhibiting agitation (i.e. repetitive walking, constant mumbling) to engaging in the activity.<sup>27</sup> Dance is a versatile activity that can be choreographed or improvised based on the individual needs of the participant. While, research studies may limit the duration of a dance intervention, dance can be incorporated throughout the day. Dance may especially be beneficial when integrated throughout the day as an informal activity. Dance promotes socialization and is an enjoyable activity contributing to high adherence rates.<sup>26,28</sup> As a result of these considerations, there is a clear need to further explore effective interventions to improve neuropsychiatric symptoms among persons living with dementia. The purpose of this integrative review is to synthesize evidence about dance impacts on anxiety and agitation among persons living with dementia.

## Methods

An integrative review methodology guided the literature search and evaluation. The framework established by Whittemore and Knafl was used as the guiding strategy for this review.<sup>29</sup> The framework includes a systematic approach for problem identification, literature searching, data synthesis through an unbiased critiquing tool, and presentation of the data.<sup>29</sup> The quality of the articles were appraised using the latest version Mixed Methods Appraisal Tool.<sup>30</sup>

### Inclusion and exclusion criteria

Studies included were required to have dance, adapted dance, dance exercise, modified dance, or recreational dance as the primary intervention with study outcomes of anxiety and/or agitation. The population in each study must focus on persons living with dementia. Only empirical articles were considered. Due to the limited publications in this area, all publication dates as well as international studies were included.

Excluded articles included non-English language, dissertations, and theses. While dissertations and theses as a publication type were excluded, the bibliographies of these publications were searched for relevant scholarly articles. Systematic reviews and meta-analysis were not included but were instead hand searched for individual studies within the publication. Articles that were methodology papers, protocols, or project proposals were not included. The focus of this review was on empirical evidence, driven by data.

### Search strategy

An expert health sciences librarian guided the search strategy. Peer reviewed, scholarly articles were searched for in the following databases: CINAHL, Nursing and Allied Health Database (ProQuest), PubMed, and Dissertations & Theses (ProQuest). Bibliographies of relevant publications were hand-searched to identify additional empirical studies to be used in the review. Databases were searched in July 2020 using the following keywords and Medical Subject Heading (MeSH) terms: Alzheimer Disease, dementia, dance, delirium, agitation, psychomotor agitation, irritability, aggression, physical function, dance, adapted dance, dance exercise, modified dance, and recreational dance. Search strategies were customized to be compatible with the specific functionality of each database. Table 1 depicts the keywords and search commands used in each database. Fig. 1 illustrates the diagram used in the searching and selection of relevant literature.

**Table 1**  
Table of databases and search commands.

| Database                                  | Keywords   |
|---|--|
| CINAHL Complete                           | (dementia OR "Alzheimer's disease" OR adrd) AND (danc* OR "adapted dance" OR "modified dance" OR "group dance" OR "recreational dance") AND (agitation OR anxiety OR aggression OR delirium)   |
| Nursing & Allied Health Source (ProQuest) | ab(dementia OR "Alzheimer's disease" OR adrd) AND (agitation OR anxiety OR aggression OR delirium) AND ab(danc* OR "adapted dance" OR "modified dance" OR "group dance" OR "recreational dance")   |
| PubMed                                    | ((("Dementia"[Mesh]) OR "Alzheimer Disease"[Mesh] OR adrd) AND (((("Psychomotor Agitation"[Mesh]) OR "Anxiety"[Mesh]) OR "Aggression"[Mesh:NoExp]) OR "Delirium"[Mesh:NoExp])) AND ("Dancing"[Mesh] OR "Dance Therapy"[Mesh] OR danc* OR "adapted dance" OR "dance exercise" OR "modified dance" OR "group dance" OR "recreational dance") |
| Dissertations & Theses (ProQuest)         | ab(dementia OR "Alzheimer's disease" OR adrd) AND (agitation OR anxiety OR aggression OR delirium) AND ab(danc* OR "adapted dance" OR "modified dance" OR "group dance" OR "recreational dance")   |

### Search outcomes

The initial search in scientific databases yielded 39 publications, including 10 dissertations and theses. After duplicates were removed, 37 publications were eligible for further examination. Titles and abstracts of all studies were screened and 7 studies were relevant. A further review of the full-text of scholarly articles, dissertations, and theses produced 6 publications that were eligible for review for inclusion. Of these 6 publications, two bibliographies were hand searched, resulting in an additional 10 scholarly articles that were eligible for inclusion. A full-text review of the 10 articles from the hand-search resulted in 2 articles eligible for further consideration. After evaluating all 8 articles that were candidates for further analysis for inclusion (6 from the original search and 2 from the hand-searched bibliographies), 5 of those studies were included in the integrative review.

### Quality appraisal

The quality of the relevant articles were assessed by two independent reviewers using the Mixed Methods Appraisal Tool.<sup>30</sup> This tool looks at empirical papers that included qualitative, quantitative, and mixed methods studies.<sup>30</sup> The tool is comprised of screening questions, a checklist of appraisal questions, and an explanation of the criteria for each type of study. Table 2 includes the checklist of questions, explanation of criteria for each study type, and results of the quality appraisal using the tool. The latest 2018 version of the Mixed Methods Appraisal Tool discourages an overall score calculation for each study. Instead, it is recommended to provide a detailed explanation of the ratings of each criterion. However, it is noted that a score may be calculated using the Mixed Methods Appraisal Tool by denoting the number of criterion met.<sup>31</sup> For example, 2 criterion met out of 5 possible criteria resulted in a 40% for an overall score, while 4 out of 5 criteria met was a score of 80%. Table 4 provides the calculated score and identifies the criterion that were not met.

### Data analysis

Data were analyzed using a constant comparison method that included data reduction, data display, data comparison, conclusion drawing and verification.<sup>29</sup> At the data reduction phase, initial subgroups were developed to categorize the data based on sample characteristics (dementia), intervention (dance), and reference to anxiety or agitation. Next, relevant data were extracted and organized into a matrix. Extracted data included authors, year of publication, country,

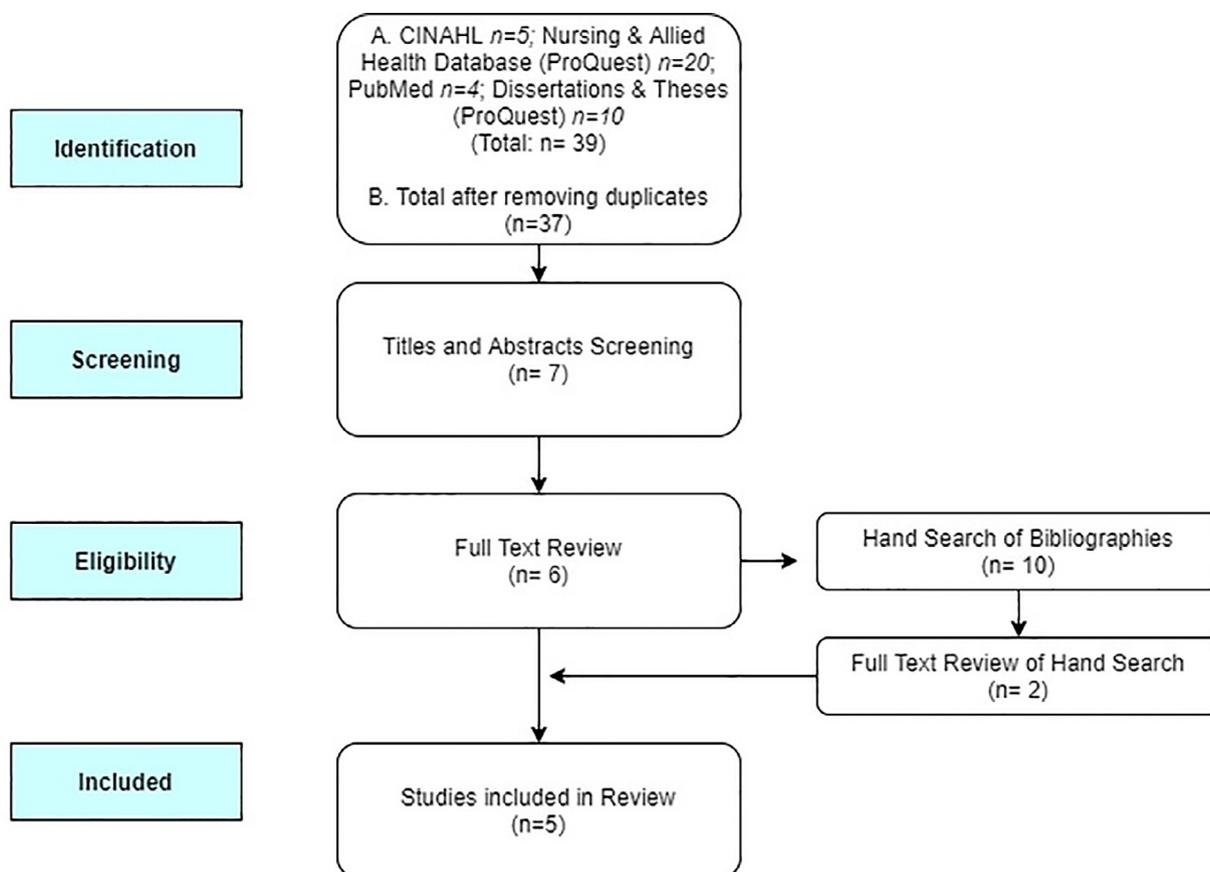


Fig. 1. Diagram of process used to identify publications for review.

study purpose, design, sample, intervention type, key findings, implications and the recommendations. At the data display phase, the extracted data were organized into a matrix (Tables 2–4) to display relevant information including a calculated quality score and detailed explanation of the ratings of each criterion for each study. At the data comparison phase, data were examined to identify patterns, characteristics, or relationships. Clustering of similar data were done. The clusters were then examined for similarities and differences followed by an examination of common and unusual patterns and confounding factors. At the conclusion drawing and verification phase, conflicting results were analyzed by comparing the frequency of significant positive results versus negative ones. Confounding factors that may have contributed to variability in results were also considered. Data verification was done by comparing our review findings with the primary studies. When necessary, we made revisions to ensure our review was reflective of the primary studies.

## Results

Data from 5 studies were extracted. They included 3 quantitative studies and 2 qualitative studies. Data analysis revealed the following common characteristics: setting, research design, intervention, participants, and outcome variables.

### Study characteristics

#### Setting

The majority of the studies were carried out in Europe ( $n = 4$ ); 2 from UK,<sup>32–33</sup> 1 from Sweden,<sup>34</sup> and 1 from Belgium.<sup>35</sup> The remaining study was from Australia.<sup>36</sup> The studies were conducted in various settings. One study was conducted in both a care home and

nursing home setting.<sup>33</sup> Remaining studies used single sites including a public psychiatric hospital,<sup>35</sup> clinical dementia unit,<sup>36</sup> nursing home,<sup>34</sup> and a care home.<sup>32</sup>

### Research design

The quantitative studies used the following designs: non-experimental,<sup>36</sup> multiple baseline single case study,<sup>33</sup> and randomized control.<sup>35</sup> The qualitative studies used grounded theory<sup>32</sup> and a content analysis method.<sup>34</sup>

### Intervention

Dance interventions varied in type, duration, frequency, and amount. All of the studies implemented different types of dance (see Table 4). All of the studies except one had structured movements or choreography that participants had to follow. The other study used non-structured free dance.<sup>34</sup> Most intervention protocols included participating in 30–60 minute sessions ranging from 1 to 3 times weekly for 4–12 weeks.

### Participants

Sample sizes ranged from 6 to 13 participants for qualitative studies and 6 to 25 participants for quantitative studies. Participants with dementia were  $> 60$  years of age. Common inclusion criteria of papers with focused on those who could walk independently and had a diagnosis of dementia. Only 1 study reported requiring participants to have evidence of agitation as part of their inclusion criteria.<sup>36</sup> Exclusion criteria varied among the studies. Most studies did not report exclusion criteria,<sup>32–34,36</sup> while one study excluded those with apathy and inability to sit in a chair for 30 minutes.<sup>35</sup>

**Table 2**  
Quality appraisal of articles.

| Quantitative descriptive studies Author (Reviewer) | Are there clear research questions? | Do the collected data allow to address the research questions? | Is the sampling strategy relevant to address the research question?      | Is the sample representative of the target population?                                 | Are the measurements appropriate?                  | Is the risk of nonresponse bias low?                                 | Is the statistical analysis appropriate to answer the research question?                      |
|--|-------------------------------------|--|--|--|--|--|---|
| Duignan et al. <sup>36</sup> (Reviewer 1)          | Yes                                 | Yes  | No*  | Can't tell   | Yes  | Yes  | Can't tell  |
| Duignan et al. <sup>36</sup> (Reviewer 2)          | Yes                                 | Yes  | Can't tell   | Can't tell   | Yes  | Yes  | Can't tell  |
| Guzmán et al. <sup>33</sup> (Reviewer 1)           | Yes                                 | Yes  | Can't tell*  | Yes  | Yes  | Yes  | Yes   |
| Guzmán et al. <sup>33</sup> (Reviewer 2)           | Yes                                 | Yes  | Yes  | Yes  | Yes  | Yes  | Yes   |
| Qualitative Articles Author(Reviewer)              | Are there clear research questions? | Do the collected data allow to address the research questions? | Is the qualitative approach appropriate to answer the research question? | Are the qualitative data collection methods adequate to address the research question? | Are the findings adequately derived from the data? | Is the interpretation of results sufficiently substantiated by data? | Is there coherence between qualitative data sources, collection, analysis and interpretation? |
| Guzmán-García et al. <sup>32</sup> (Reviewer 1)    | Yes                                 | Yes  | Yes  | Yes  | Yes  | Yes  | Yes   |
| Guzmán-García et al. <sup>32</sup> (Reviewer 2)    | Yes                                 | Yes  | Yes  | Yes  | Yes  | Yes  | Yes   |
| Palo-Bengtsson et al. <sup>34</sup> (Reviewer 1)   | Yes                                 | Yes  | Yes  | Yes  | Yes  | No*  | Yes   |
| Palo-Bengtsson et al. <sup>34</sup> (Reviewer 2)   | Yes                                 | Yes  | Yes  | Yes  | Yes  | Can't tell*  | Yes   |
| Randomized Control Trial Author (Reviewer)         | Are there clear research questions? | Do the collected data allow to address the research questions? | Is randomization appropriately performed?                                | Are the groups comparable at baseline?   | Are there complete outcome data?                   | Are outcome assessors blinded to the intervention provided?          | Did the participants adhere to the assigned intervention?                                     |
| Van de Winckel et al. <sup>35</sup> (Reviewer 1)   | Yes                                 | Yes  | No   | Yes  | Yes  | Yes  | Yes   |
| Van de Winckel et al. <sup>35</sup> (Reviewer 2)   | Yes                                 | Yes  | Can't tell   | Yes  | Yes  | Yes  | Yes   |

**Table 3**  
Characterization data of studies.

| Authors  | Year of publication | Study design                            | Country   |
|--|---------------------|---|-----------|
| Duignan, Hedley, & Milverto <sup>36</sup>                  | 2009                | Non-experimental pilot                  | Australia |
| Guzmán, Freeston, Rochester, Hughes, & James <sup>33</sup> | 2016                | Multiple-baseline single-case study     | England   |
| Guzmán-García, Mukaetova-Ladinska, & James <sup>32</sup>   | 2013                | Grounded theory qualitative pilot study | England   |
| Palo-Bengtsson, Winblad, & Ekman <sup>34</sup>             | 1998                | Qualitative study                       | Sweden    |
| Van de Winckel, Feys, De Weerd, & Dom <sup>35</sup>        | 2004                | Randomized control trial                | Belgium   |

### Outcome variables

The outcome variables measured in the studies included: anxiety, agitation, and aggression. Majority of the studies used different measurements to assess the effectiveness of dance on the outcomes. Anxiety was assessed by observations of participants, it is important to note anxiety was only examined in the qualitative studies.<sup>32,34,35</sup> Agitation was assessed by different measures. Duignan et al.<sup>36</sup> used the Cohen-Mansfield Agitation Inventory,<sup>5</sup> while Guzman et al.<sup>33</sup> used the Dementia Mood Assessment Scale.<sup>37</sup> Van de Winckel et al.<sup>35</sup> assessed aggression using the BOP Scale that is a Dutch abbreviated version of the Stockton Geriatric Rating Scale.<sup>38</sup>

### Impacts of dance on anxiety

Two studies reported findings related to anxiety among dance participants. One qualitative study found the care home staff reported participants having lower anxiety.<sup>32</sup> In contrast, another qualitative study reported during the dance sessions “some patients showed anxiety”.<sup>34</sup> Although, in this same study there were also reports participants had positive feelings such as happiness and joy.<sup>34</sup>

### Impacts of dance on agitation

Four dance studies reported on agitation. A case study reported improvement in agitation for one participant following 12 weeks of dance.<sup>33</sup> In a very small pilot study (n=6), there was some reduction in agitation for 4 participants as their scores on the Cohen-Mansfield Agitation Inventory<sup>5</sup> decreased an average of 6.14 points following 4 weeks of dance.<sup>36</sup> In 1 qualitative study, care staff reported some decreases in agitation among participants.<sup>32</sup> While in another qualitative study, one participant was observed to have “severe restlessness” during dance sessions.<sup>34</sup>

### Discussion

This integrative review adds to the literature on non-pharmacological interventions for persons living with dementia by revealing that dance therapy has a positive impact on anxiety and agitation. A significant finding is that persons living with dementia experienced some type of improvement in agitation and anxiety albeit differences in research methods. These improvements could be explained by

**Table 4**  
Review findings and MMAT quality score.

| Purpose/Aim   | Sample Size | Intervention Type  | MMAT Quality Score (20% = 1 criterion met; 40% = 2 criterion met; 60% = 3 criterion met; 80% = 4 criterion met, 100% = 5 criterion met) | Key Findings   | Implications and Recommendations  |
|---|-------------|--|---|--|---|
| To evaluate Wu Tao dance as intervention for dementia and assess agitation. <sup>36</sup>   | N = 6       | Dance that includes music and meditation. 1x/week for 4 weeks.   | 40% (missing information on the sampling strategy, representativeness of target population, and statistical analysis)                   | Mean reduction in agitation assessed by the CMAI was 6.14.   | Led to a more positive work environment for staff.  |
| Understand the effect of DANCIN on the behavior and mood of persons living with mild-moderate dementia. <sup>33</sup>   | N = 10      | Danzón Latin Ballroom class was 30 min 2x/week for 12 weeks  | 80-100% (Range due to difference in independent reviewer quality appraisals)  | Agitation improved in 1 participant. Irritability improved in 3 participants.  | Data suggest that the intervention can be used to decrease irritability or depression, increase self-esteem, important factors for positive mood in dementia. Overall, this intervention showed reduction in terms of social isolation in residents previously described as socially withdrawn. |
| Purpose of the study is to investigate the effect of introducing a dance based psychomotor intervention using Danzon (Latin ballroom) for people with dementia in care homes. <sup>32</sup> | N = 13      | Latin ballroom 35 minutes session twice a week for 6 weeks.  | 100%  | Care staff reported observing improvements in behavior such as lowered anxiety, reduced frustration, wandering, and agitation. Confidence and joy also reported. | Dance is suitable for people with dementia of mixed severity, as it was observed that staff simplified the requested dancing commands to reduce frustration in the more severe cases.   |
| How persons with dementia disease function in social dance sessions? <sup>34</sup>  | N = 6       | 45 minutes dance session with music performed by local band at 4 events over a 12 week period (popular Swedish dance music). Free dance. No structural choreography to follow. | 80% (Unclear if results substantially substantiated by data, no transcription reported).  | Patients showed emotions such as joy and happiness. During dance sessions: Some patients showed anxiety. One patient showed severe restlessness.                 | The patient's intellectual, emotional, and motor functions were supported in dancing. It is recommended that carers use social dancing intentionally as nursing intervention.   |
| To evaluate the effect of a musical exercise program on mood state and cognitive function in women with dementia. <sup>35</sup>   | N = 25      | Daily physical exercises supported by music for 30 min/session for 3 months.   | 80% (Needed more information to assess whether randomization was appropriately done.)   | The effects on behavioral changes were not significant.  | Research suggests a beneficial effect of cognition using a music-based exercise program in a group of patients with moderate to severe dementia.  |

dance eliciting positive emotions in persons with dementia.<sup>26</sup> Dance also provides a way for persons with dementia to express themselves physically as well as providing for social interaction that can alleviate boredom and sensory deprivation that can contribute to anxiety or agitation.<sup>36</sup> Even small reductions in anxiety and agitation can improve the well-being for the person living with dementia.

The research methodology varied for all of the studies. In the research designs, all of the studies had a small sample size that is not uncommon in studies with persons with dementia.<sup>39</sup> An explanation for this could be that persons living with dementia may be difficult to recruit due to their cognitive impairments and ability to consent. Another finding was that the duration of studies varied noting that participants with dementia had limited participation between 4 and 12 weeks. Although improvements in agitation were noted after 4 weeks of dance, it is important to examine the long-term impacts to assess the sustainability and effectiveness of the intervention.

Our review is the first to examine dance impacts on anxiety and agitation in persons living with dementia. However, there have been reviews of dance movement therapy and exercise programs. In a systematic review of dance movement therapy, the effects of dance movement therapy for dementia revealed no evidence to support it as an effective intervention due to no studies meeting inclusion

criteria.<sup>40</sup> It is important to note that dance movement therapy requires a trained dance movement therapist and participants are encouraged to engage in creative movements rather than performing choreographed steps to music. In a systematic review on exercise, there was no significant effect of exercise programs on depression or challenging behaviors such as agitation.<sup>41</sup>

We agree that the evidence is weak or lacking on whether exercise such as dance significantly reduces anxiety and agitation. Of the 5 dance studies reviewed, 4 yielded positive results for anxiety and/or agitation. However, the small sample sizes, inadequate details of methodology and data analysis limit the generalizability of these findings. Although these findings show promise, more studies of dance are needed to examine anxiety, agitation, as well as other neuropsychiatric symptoms in persons living with dementia.

#### Limitations

Our review has several limitations. Our search was restricted to the English language and relevant studies published in other languages may have been overlooked. Also some studies did not publish all of the information needed to complete the quality appraisal.

Reviewers should consider contacting the authors of the included studies to obtain any non-reported information.

### Implications for practice

The studies reviewed did not reveal any safety concerns or adverse events. Likewise, studies reported low attrition. The minimal risk to safety and the potential benefits warrant considering dance for those living with dementia. In order to consider dance in a facility setting, the therapists and staff should be included in designing and executing implementation. For example, dance classes should be scheduled in the morning as it is known that persons with dementia often are fatigued and tired later in the day.<sup>42</sup>

If clinicians accept dance, it could be implemented as part of an activity program. A challenge for clinicians and administrators could be the costs associated with a dance program. Thus, if an experienced dance instructor is not affordable, non-choreographed or improvisational dance may be an option. The costs associated with this type of program would include music, dedicated space, and a staff member to supervise and lead the dance. If cost is a concern, consider collaborating with a local organization or academic institution that has people willing to spend time and dance with persons with dementia.

### Implications for future research

Findings of this review support the need for continued research on the effectiveness of dance to improve neuropsychiatric symptoms, anxiety, and agitation in persons with dementia. Limitations of the studies reviewed suggest the need for well-designed, robust methodology, and analysis. Future research should consider using the Neuro-psychiatric Inventory<sup>43</sup> and Cohen-Mansfield Agitation Inventory<sup>5</sup> as measures of agitation as these are commonly used in clinical and research practice. Only one study in this review used one of these instruments, it would be beneficial to continue to use these same valid and reliable measures.

Another consideration for research is to specify stage of dementia as well as medication usage in sample characteristics. At what stage would dance no longer be beneficial? Does medication use such as antipsychotics change while participating in dance? These questions should be asked if dance is going to be recommended as an effective non-pharmacological approach. Although there are various types of dance, empirical data on the same dance type, intensity, duration, and frequency is needed to replicate studies and validate findings. This can be difficult to implement unless the same research team repeats their studies or publishes the details of their dance program.

As noted in the findings, the settings of the studies varied from psychiatric hospital to nursing home or care home settings. These different settings may be challenging to researchers in areas of recruitment and implementation. Recruitment may be challenging if the facility staff does not support dance for those with dementia. Another challenge can be the facility may already have programs such as music that is well attended by persons with dementia. For this reason, we recommend seeking to implement dance where persons with dementia lack social interaction or physical activity. Lastly, we noted in this review that often cultural dance is used that is appropriate for the population being studied but may not achieve the same acceptance with a different population. In this case, detailed descriptions of the intervention method is needed so comparisons in choreography or dosing can be drawn.

### Conclusion

This review is the first to examine the impacts of dance on anxiety and agitation in persons living with dementia. Despite limitations, following Whittemore and Knaff's approach for conducting

integrative reviews<sup>29</sup> in addition to Hong et al. Mixed Methods Appraisal tool<sup>30</sup>, provided for a high quality, thorough, and transparent review process. Findings suggest that dance may improve anxiety and agitation among those with dementia. However, based on our evaluation, the evidence is weak and further research is needed.

### Declaration of Competing Interest

None.

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