

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

# Non-Pharmacological Interventions for the Treatment of Behavioural Issues: Clinical Effectiveness, Cost- Effectiveness, and Guidelines

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## Research Questions

1. What is the clinical effectiveness of non-pharmacological interventions for the treatment of adults with behavioural issues?
2. What is the cost-effectiveness of non-pharmacological interventions for the treatment of adults with behavioural issues?
3. What are the evidence-based guidelines regarding the use of non-pharmacological interventions for the treatment of adults with behavioural issues?

## Key Findings

One health technology assessment, twelve systematic reviews (four with meta-analyses), eighteen randomized controlled trials, and four evidence-based guidelines were identified regarding the effectiveness and use of non-pharmacological interventions for treating patients with behavioral issues in acute or long-term care settings. No relevant economic evaluations were identified.

## Methods

A limited literature search was conducted on key resources including Ovid Medline, Ovid PsycINFO, the Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 01, 2014 and April 01, 2019. Internet links were provided, where available.

## Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

**Table 1: Selection Criteria**

<b>Population</b>	Adults with behavioural issues in long term care or acute care settings Potential subgroups of interest: patients with dementia, traumatic brain injury, or intellectual disability, and senior populations
<b>Intervention</b>	Non-pharmacological interventions (e.g., music therapy, functional analysis-based interventions, psychological treatment, reminiscence therapy, exercise therapy, validation therapy, weighted blankets, least restrictive care, pet therapy)
<b>Comparators</b>	Q1-Q2: Pharmacological interventions; Restraints; Usual care; No treatment, placebo; Alternative non pharmacological interventions Q3: No comparator
<b>Outcomes</b>	Q1: Clinical effectiveness (e.g., quality of life, depression, anxiety, hallucinations, reduction in negative or maladaptive behaviours, improvements in stress) Q2: Cost-effectiveness Q3: Evidence-based guidelines
<b>Study Designs</b>	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

## Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials and economic evaluations, and evidence-based guidelines. Due to the volume of identified evidence, non-randomized studies were not included.

One health technology assessment, twelve systematic reviews (four with meta-analyses), eighteen randomized controlled trials, and four evidence-based guidelines were identified regarding the effectiveness and use of non-pharmacological interventions for treating patients with behavioral issues in acute or long-term care settings. No relevant economic evaluations were identified.

Additional references of potential interest are provided in the appendix.

## Overall Summary of Findings

One health technology assessment (HTA),<sup>1</sup> twelve systematic reviews (four with meta-analyses),<sup>2-13</sup> eighteen randomized controlled trials (RCT)<sup>14-31</sup> and four evidence-based guidelines<sup>32-35</sup> were identified regarding the effectiveness and use of non-pharmacological interventions for treating patients with behavioral issues in acute or long-term care settings. Detailed study characteristics are provided in Table 2.

The identified HTA<sup>1</sup> concluded that a variety of non-pharmacological interventions for treating patients with dementia in long-term care are likely practical first line therapy options with approximately half of the reported studies improving multiple patient outcomes.

Seven out of the twelve identified systematic reviews<sup>2,4,5,8,9,11,12</sup> assessed whether sensory-based or patient-level interventions (e.g. music, dance, aromatherapy, pet therapy, etc.)

were effective in treating patients with dementia and epilepsy or other intellectual disabilities. Overall, there was no consensus among the studies<sup>2,4,5,8,9,11,12</sup> that these non-pharmacological interventions were effective in improving patients well-being (e.g. anxiety, depression, quality of life).

Additionally, two of the identified systematic reviews<sup>3,6</sup> evaluated whether reminiscence therapy (RT) and simulated presence therapy (SPT) improved outcomes including quality of life, agitation, and cognition in dementia patients compared to usual care (or control group). Authors of the RT study<sup>3</sup> concluded there were improvements in quality of life, cognition, and mood while the SPT study<sup>6</sup> concluded there were no statistically meaningful results between the SPT and control groups.

Another two systematic reviews<sup>7,13</sup> were identified that evaluated the effects of cognitive or psychological therapy in patients with dementia or receiving mental health care. Both interventions had small to moderate effect on patient-related outcomes including quality of life, depression, anxiety, and cognition.<sup>7,13</sup>

The final systematic review<sup>10</sup> concluded that four types of meal-time interventions (music, change in food service, dining environment, and group conversation) improved behavioral symptoms in dementia patients; although relative outcomes were not specified by the authors.

Of the identified 18 RCT studies,<sup>14-31</sup> six of these studies<sup>14,17,18,21,22,29</sup> examined whether music or dance therapy improved outcomes for patients with dementia or cognitive impairment compared to usual care or other interventions. Although, one study<sup>21</sup> did not summarize their results, all of the other studies concluded that some form of dance or music therapy improved a variety patient outcomes, including quality of life and daily living activities. Alternatively, two RCT studies<sup>24,27</sup> concluded that exercise regimens or sport therapy did not improve outcomes for patients with dementia.

Moreover, another two RCT studies<sup>16,28</sup> focusing on relaxation therapy<sup>16</sup> and stress reduction techniques,<sup>28</sup> concluded that these interventions were effective in improving behavioral symptoms and quality of life for patients with dementia compared to control groups.

In addition, four identified RCT studies<sup>19,23,25,26</sup> assessed individualized and social interaction interventions along with multi-sensory stimulation environment for dementia patients in a variety of long-term care settings. Two of these studies<sup>19,23</sup> did not find improvements in outcome measures compared to the control groups while the other two studies<sup>25,26</sup> found individualized learning therapy and multi-sensory stimulation improved various patient outcomes like depression.

Two RCT studies<sup>15,30</sup> focusing on cognitive stimulation therapy and storytelling concluded that these two interventions were not statistically significant in improving patient outcomes in dementia patients when compared to usual care. Two RCT studies<sup>20,31</sup> concluded that simulated family presence and animal assisted activities significantly improved patient outcomes like cognition, quality of life, and other behavioral symptoms in dementia patients.

Four evidence-based guidelines<sup>32-35</sup> were identified regarding the use of non-pharmacological interventions in order to improve behavioral and psychological symptoms of dementia patients in long-term care. The National Institute for Health and Care Excellence (NICE)<sup>32</sup> recommends offering a range of activities that are tailored to patient

preferences that may promote cognition and independence, while cognition therapy and reminiscence therapy are recommended for patients living with dementia. Additionally, a guideline<sup>33</sup> by the Newfoundland and Labrador Centre for Applied Health Research (NLCAHR) considered music therapy as a possible intervention for patients living with moderate or severe dementia in long-term care, although the literature findings were inconclusive. In accordance with the NLCAHR guidelines,<sup>33</sup> another guideline<sup>34</sup> suggests music therapy along with home-based behavioural techniques, care-giver interventions, and dementia care mapping may improve anxiety and agitation in patients with dementia. Finally, the Registered Nurses' Association of Ontario (RNAO) guidelines<sup>35</sup> recommend a tailored treatment approach for dementia or delirium patients that encompasses non-pharmacological interventions best suited to each individual while considering the severity or stage of the disease.

**Table 2: Summary of Identified Literature**

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
<b>Health Technology Assessments</b>					
Health Technology Assessment Unit <sup>1</sup> (2014)	Patients with dementia (N=20 to 398)  Nursing and residential care	Four categories: Comprehensive assessments, Social contact, Structured activities, Sensory examination/relaxation	Usual care, Waiting list, No treatment	NPI, BEHAVE-AD, ABC, CMAI, DBS, BARS, AD-RD, DMAS, CAPE-BRS, ABMI, RAI, BIP, BPSD, BOP, ABRS	<ul style="list-style-type: none"> <li>- 40 RCT studies identified</li> <li>- 21 of the 40 studies reported benefit of intervention over control for behavioral symptoms</li> <li>- 19 of the 40 studies reported no statistically meaningful difference between groups</li> <li>- No literature met the CE inclusion criteria</li> </ul>
<b>Systematic Reviews and Meta-Analyses</b>					
Van der Steen et al. <sup>2</sup> (2018)	Patients with dementia (N=1097)  Institutionalized care	Music-based interventions (group and individual based) for at least 5 sessions	Usual care, No treatment	QoL, Mood disturbance or negative affect, Behavioral problems, Social behavior and cognition at the end of therapy or treatment	<ul style="list-style-type: none"> <li>- 22 studies met inclusion criteria</li> <li>- 9 of these studies found the interventions may improve QoL</li> <li>- 13 studies of these found the interventions may reduce anxiety</li> <li>- Little or no effective on agitation, aggression or on cognition</li> </ul>
Woods et al. <sup>3</sup>	Patients with	RT (group and	No treatment,	QoL,	- 22 studies met the

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
(2018)	dementia (N=1907); for MA (N=1749)	individual) for at least 6 sessions  Long-term and home care	Passive control group	Cognition, Communication, Behavior, Mood, Care-taker outcomes	<ul style="list-style-type: none"> <li>- 16 studies included in MA</li> <li>- Inconsistent results across studies</li> <li>- Moderate improvements in QoL, cognition and communication and mood.</li> <li>- Group RT increased communication</li> </ul>
Karkou and Meekums <sup>4</sup> (2017)	Patients with dementia (N=0)  Any care setting	Dance movement therapy	Standard of care, No treatment, Other treatments	Not specified	<ul style="list-style-type: none"> <li>- None of the RCTs met the inclusion criteria</li> <li>- No conclusions can be drawn regarding the effectiveness of dance movement therapy</li> </ul>
Abraha et al. <sup>5</sup> (2017)	Patients with dementia	Sensory stimulation interventions (e.g. shiatsu, dance, music), Cognitive/emotion interventions (e.g. RT), Behavior management techniques, Multi-components techniques, Other therapies (e.g. exercise, animal-assisted care)	Not specified	BPSD, NPI, BPRS, CMAI, CSDD	<ul style="list-style-type: none"> <li>- 38 SRs and 129 primary studies met the inclusion criteria</li> <li>- Music therapy and behavioral management techniques were effective in reducing BPSD</li> </ul>
Abraha et al. <sup>6</sup> (2017)	Patients with dementia (N=144)  Nursing homes	SPT	Usual care, Placebo treatment, Personalized music intervention	Agitation (physically and mentally), Verbal disruptive behavior, QoL, Dropout, Activities of daily living	<ul style="list-style-type: none"> <li>- Effect of SPT compared to usual care had mixed outcomes</li> <li>- No significant difference between SPT and personalized music intervention</li> <li>- No conclusions drawn overall</li> </ul>
Folkerts et al. <sup>7</sup>	Patients with	Cognitive	Control groups	Global cognition,	<ul style="list-style-type: none"> <li>- 27 articles met</li> </ul>

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
(2017)	dementia  Long-term or institutionalized care	interventions		Autobiographical memory, BPSD, QoL, Activities of daily living, Depression	<ul style="list-style-type: none"> <li>- inclusions criteria for SR</li> <li>- MA calculated effects on outcomes 15 RCTs</li> <li>- Significant moderate effects found for global cognition, autobiographical memory and BPSD</li> <li>- Significant small effects found for QoL</li> </ul>
ARHQ <sup>8</sup> (2016)	Patients with dementia	Patient-level interventions (e.g. music, aromatherapy, bright light), Skill-tailored interventions, Care delivery-level interventions	Usual care, Attention control	Agitation, Aggression, AE	<ul style="list-style-type: none"> <li>- 126 RCTs met inclusion criteria</li> <li>- All interventions were comparable to usual care or unable to draw conclusive results</li> </ul>
Forrester et al. <sup>9</sup> (2016)	Patients with dementia (N=428)	Aromatherapy	Placebo, No comparator	Agitation, Behavioral symptoms, QoL, Activities of daily living, AE	<ul style="list-style-type: none"> <li>- 7 studies met inclusion criteria</li> <li>- No conclusions can be drawn due to conflicting results from included studies</li> </ul>
Whear et al. <sup>10</sup> (2014)	Patients with dementia  Care homes	Meal time interventions (music, changes to food service, dining environment and group conversation)	Not specified	Behavioural symptoms	<ul style="list-style-type: none"> <li>- 11 studies met the inclusion criteria</li> <li>- Six studies indicated statistically significant improvement in behavioral symptoms favoring interventions</li> </ul>
Livingston et al. <sup>11</sup> (2014)	Patients with dementia  Care homes	Non-pharmacological interventions (music therapy, sensory therapy, activities, aromatherapy, pet therapy etc.)	Not specified	Level of agitation, QoL, Cost-effectiveness, Inappropriate medication use, Delay institutionalization	<ul style="list-style-type: none"> <li>- 160 articles met the inclusion criteria</li> <li>- Person-centered care, communication skills, sensory therapy, music therapy all reduced agitation</li> <li>- No improvement in QoL when reported in specific studies</li> </ul>
Jackson et al. <sup>12</sup> (2015)	Patients with epilepsy and/or	Non-pharmacological interventions	Not specified	No outcomes were reported for	<ul style="list-style-type: none"> <li>- One study met the inclusion criteria</li> </ul>

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
	intellectual disabilities	(specialized diets, psychological interventions, yoga, acupuncture, relaxation therapy etc.)		patients with intellectual disabilities	- No results found regarding patients with intellectual disabilities
Paterson et al. <sup>13</sup> (2018)	Patients receiving mental health care  Acute mental care facilities	Psychological therapy	Not specified	Psychotic symptoms, Anxiety, Depression, Readmissions	- Intervention was associated with a reduction in readmissions, depression and anxiety  - MA showed small to moderate effect
<b>Randomized Controlled Trials</b>					
Werner et al. <sup>14</sup> (2017)	Elderly patients (N=117)  Nursing homes	Interactive musical therapy (N=62)	Recreational singing therapy (N=55)	MADRS	- Depressive symptoms improved significantly in musical therapy group compared to singing therapy group
Apostolo et al. <sup>15</sup> (2014)	Elderly patients (N=56)  Nursing homes	CST, 14 sessions	Usual care	MSA, GDS-15, Activities of daily living	- CST increased cognition but did not improve depressive symptoms compared to usual care group
Reig-Ferrer et al. <sup>16</sup> (2014)	Elderly patients  Nursing homes	Relaxation techniques	Waitlist control group	Psychological well-being, QoL	- Relaxation technique group had improved QoL and psychological well-being compared to control group
Vankova et al. <sup>17</sup> (2014)	Elderly patients  Nursing homes	Dance therapy	Control Group	GDS-15	- GDS scores significantly improved in dance therapy group compared to control group
Vink et al. <sup>18</sup> (2014)	Elderly patients  Nursing homes	Music therapy	Recreational therapy	NPI	- Music therapy group had greater reduction in NPI scores compared to recreational therapy group
DiNapoli et	Patients with	ISAI	Usual care	QoL,	- No evidence of

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
al. <sup>19</sup> (2016)	cognitive impairment (N=52) Geriatric psychiatric facility			NRSR	significant treatment effect on QoL and NRSR for ISAI compared to usual care group
Waszynski et al. <sup>20</sup> (2018)	Patients with hyperactive or mixed delirium (N=111) Acute hospital care	Simulated family presence (family video)	Usual Care or nature video	ABS, Delirium	<ul style="list-style-type: none"> <li>- Post-intervention: ABS scores improved in both family and nature video groups</li> <li>- Statistically significant difference between family video and usual care groups following the interventions</li> </ul>
Ho et al. <sup>21</sup> (2018)	Patients with dementia (N=73) Residential homes	Group-based music (N=40)	Standard of care (N=33)	Behavioral and psychological symptoms	<ul style="list-style-type: none"> <li>- Results not specified</li> </ul>
Cho, HK <sup>22</sup> (2018)	Patients with dementia (N=52) Long-term care	Music-therapy singing group	Control groups: Television group, Music-medicine listening group	QoL	<ul style="list-style-type: none"> <li>- Music-therapy singing significantly improved QoL compared to other control groups</li> </ul>
Ballard and YongZhong <sup>23</sup> (2016)	Patients with dementia Nursing homes	Social interaction with person-centered care, Exercise with person-centered care	Person-centered care only	Agitation, Depression, Antipsychotic use, Neuropsychiatric symptoms, Mortality	<ul style="list-style-type: none"> <li>- Antipsychotic review plus the social interaction intervention significantly reduced mortality</li> <li>- The exercise intervention significantly improved neuropsychiatric symptoms but not depression</li> <li>- None of the interventions significantly impacted agitation</li> </ul>
Bostrom et al. <sup>24</sup> (2016)	Patients with dementia (N=186) Residential care	High-intensity functional exercise program	Non-exercise control activity	GDS, MADRS	<ul style="list-style-type: none"> <li>- No difference in GDS and MADRS scores between exercise and control groups</li> </ul>

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
Chen et al. <sup>25</sup> (2016)	Patients with dementia (N=44)  Institutionalized care	Individualized learning therapy (N=23)	Usual care (N=21)	MMSE, NPI, Improvements in hallucinations, Bizarre behavior, Depression, Apathetic expression, Irritability, Sleep disorder	- Learning therapy group had higher MMSE, lower NPI scores, improvements in hallucinations, bizarre behavior, depression, apathetic expression, irritability and sleep disorder
Sanchez et al. <sup>26</sup> (2016)	Patients with dementia (N=22)  Institutionalized care	MSSE	Individualized music sessions	CMAI, CSDD, MMSE, BANS-S, RAID	- MSSE group had significant improvements in CMAI, RAID and BANS-S scores - Overall, MSSE group had better effect on anxiety and depression compared to individualized music group
Treusch et al. <sup>27</sup> (2015)	Patients with dementia with apathy (N=117)  Nursing homes	Interdisciplinary occupational and sport therapy	Control group	AES, NPI	- Control group had increased AES score - Overall, apathy decreased in intervention group but did not last one year after cessation of therapy
Moss et al. <sup>28</sup> (2015)	Patients with dementia (N=39)  Continuing community care	Stress reduction program (N=20)	Waitlist control group (N=19)	HRQoL, Acceptance and psychological flexibility mindfulness, Self-compassion, Psychological distress	- Acceptance and psychological flexibility significantly improved in stress reduction group compared to control group
Raglio et al. <sup>29</sup> (2015)	Patients with dementia (N=120)  Institutionalized care	Active music therapy, individualized listening to music	Standard of care	NPI, CSDD, CBS-QoL	- Both intervention groups had a reduction in NPI scores compared to standard of care - Overall, both intervention groups did not have a

First Author or Organization (Year)	Patient Population (Number of subjects) and Care Setting	Intervention Group	Comparator Group	Outcomes	Results
					significant impact on subjects
Houser et al. <sup>30</sup> (2014)	Patients with Dementia (N=20)  Nursing homes	TimeSlips (storytelling program) (N=10)	Standard of care (N=10)	Psychotropic medication use, Mood, Behavioral symptoms	<ul style="list-style-type: none"> <li>- No statistical difference between groups for mood and behavioral symptoms</li> <li>- No differences in psychotropic medication use between use</li> </ul>
Olsen et al. <sup>31</sup> (2016)	Patients with dementia and/or cognitive impairment (N=58)  Nursing homes	Animal-assisted activities (N=28)	Control group (N=30)	QoL, BARS, CSDD	<ul style="list-style-type: none"> <li>- Animal-assisted activities had a significant improvements in CSDD and QoL but did not improve BARS</li> </ul>

ABC= Abberant Behaviour Checklist; ABMI= Agitation Behaviour Mapping Instrument; ABS= agitation behavioural score; AD-RD= Alzheimer's Disease And Related Disorders Mood Scale; AE= adverse events; BANS-S= Bedford Alzheimer Nursing Severity Scale; BARS= Brief Agitation Rating Scale; BHAVE-AD= Behavioural Pathology In Alzheimer's Disease Rating Scale; BIP= Behavioural Observation Scale For Intramural Psychogeriatry; BOP= Beroordelingsschaal Voor Oudere Patienten; BPSD= Behavioural And Psychological Symptoms Of Dementia; CAPE-BRS= Clifton Assessment Procedures For The Elderly – Behavioral Rating Scale; CBS-QoL= Cornell-Brown Scale for Quality of Life; CE= cost-effectiveness; CMAI= Cohen-Mansfield Agitation Inventory; CSDD: Cornell Scale for Depression in Dementia; CST= cognitive stimulation therapy; DBS= Disruptive Behaviour Scale; DMAS= Dementia Mood Assessment Scale; GDS= Geriatric Depression Scale; ISAI= individualized social activities intervention; MA= meta-analysis; MADRS= Montgomery-Asberg Depression Rating Scale; MCA= Montreal Cognitive Assessment; MMSE= Mini-Mental Status Examination; MSSE= multi-sensory stimulation environment; NPI= Neuropsychiatric Inventory; NRSR= Neurobehavioural Rating Scale-Revised; QoL= quality of life; RAI= Resident Assessment Instrument; RAID= rating anxiety in dementia; RT=reminiscence therapy; SPT= simulated prescence therapy; SR= systematic review.

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### Health Technology Assessments

#### *Patients with Dementia*

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