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Staff Training Interventions to Prevent or Reduce Behavioural and Psychological Symptoms of Dementia in Nursing Home Residents: A Mixed Methods Systematic Review

Daphnée Carrier[a] Élodie Toulouse[a] Christian M. Rochefort[a, b, c]

[a]School of Nursing, Faculty of Medicine and Health Sciences, Université de Sherbrooke, Sherbrooke, QC, Canada; [b]Research Centre, Hôpital Charles-Le Moyne, Longueuil, QC, Canada; [c]Research Centre, Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC, Canada

Keywords
Staff training · Nursing home · Behavioural and psychological symptoms of dementia management · Neurocognitive disorder · Dementia

Abstract
Introduction: Nursing home (NH) staff mention knowledge deficits regarding the management of behavioural and psychological symptoms of dementia (BPSDs) in residents with neurocognitive disorders (NCDs). Staff training therefore appears to be necessary. However, existing evidence on best training practices and their outcomes remains scattered. This systematic review aimed to (1) identify the best clinical practices and theoretical bases of staff training interventions on BPSD management in NHs and (2) summarize the effects of these interventions on resident and staff outcomes. ***Methods:*** A mixed methods systematic review was conducted. Two nurse researchers independently searched nine electronic databases to identify studies on the efficacy of staff training interventions aimed at BPSD management in NHs, on a variety of resident and staff outcomes. The search was conducted for articles published between 1996 and 2022, using selected keywords, MeSH terms, and predefined eligibility criteria. The methodological quality of the retrieved studies was assessed using JBI checklists. ***Results:*** Overall, 39 studies in 47 articles were included. Ten categories of trainings were identified, of which three demonstrated the most promising results on both residents and staff: (1) structured protocols and models, (2) person-centred bathing, and (3) communication techniques. The methodological quality of the retrieved studies was generally weak. Issues with intervention feasibility and reproducibility were also noted. ***Conclusion:*** Training interventions incorporating structured protocols and models, person-centred bathing, and communication techniques are associated with better staff and resident outcomes. However, there is a strong need for high-quality research to strengthen existing evidence and ensure feasibility and reproducibility.

Introduction

Behavioural and psychological symptoms of dementia (BPSDs) are defined as "signs and symptoms of disturbed perception, thought content, mood, or behaviour that frequently occur in patients with dementia" [1] or a neurocognitive disorder (NCD). In nursing homes

karger@karger.com
www.karger.com/dem

Correspondence to:
Daphnée Carrier, Daphnee.Carrier@USherbrooke.ca

Karger

(NHs), their prevalence ranges from 91.7% to 97% [2–5]. The most prevalent BPSDs are apathy [5, 6], irritability [2, 7], agitation [2, 6, 6, 7], and depression [4–8]. These symptoms have many aetiologies and are believed to be a manifestation of an unsatisfied need [8, 9]. BPSDs and their suboptimal management are associated with many negative consequences on the resident (e.g., decreased quality of life [QoL] [8–10], increased mortality [7, 11]), the staff (e.g., increased distress [12, 13] and burnout [12, 14]), and the healthcare system (e.g., increased resource use and costs [15]).

Research suggests that most pharmacological treatments have limited efficacy for BPSD management and many undesired side effects (e.g., dizziness, nausea) [16, 17]. Consequently, current guidelines recommend non-pharmacological interventions as first-line treatment [17–20]. Despite existing evidence on the efficacy of non-pharmacological interventions for BPSD management (e.g., sensory-focused strategies [19, 21–23], person-centred care (PCC) [21, 22, 22, 24]), an important implementation gap exists, and staff mention having limited knowledge and skills, reducing their capacity to intervene adequately with this clientele [25]. Staff training is therefore necessary to allow strong evidence-based practice changes [21, 22].

Several systematic reviews on BPSD staff training interventions have been published. However, they provide a partial summary of existing evidence by either focusing on a precise type of intervention (e.g., person-centred care, communication techniques [26–28]) or a limited range of outcomes (e.g., resident agitation [22, 29], functional ability or QoL [30]). Consequently, this systematic review aimed to address this gap by providing a comprehensive overview of (1) staff training interventions aiming BPSD management in NHs, their theoretical bases, and best clinical practices regarding their implementation, and (2) the effects of these interventions on resident and staff outcomes.

Methods

Design

A mixed methods systematic review was conducted according to the Joanna Briggs Institute (JBI) [31, 32] and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines [33].

Search Strategy

A comprehensive search strategy was developed with a scientific librarian. Two nurse researchers (DC and ÉT) independently searched nine electronic databases (CINAHL, MEDLINE, PsycInfo, Scopus, Cochrane Library, AgeLine, Psychology and Behavioral Sciences Collection, Education Resource Information Center, and Education Source) to identify studies reporting on the efficacy of staff training interventions aiming BPSD management in NHs and their outcomes. The initial search was performed for articles published between January 1, 1996, the year in which the term BPSD was created [1], and March 9, 2021, and was last updated on January 20, 2022. Our search strategy was composed of three steps.

Firstly, we searched the databases using the following concepts: (1) BPSDs, (2) training, and (3) staff, their pertinent keywords, Medical Subject Headings, and Boolean operators (online suppl. Table 1; for all online suppl. material, see https://doi.org/10.1159/000530503). Secondly, the same two researchers (DC and ÉT) screened the titles and abstracts of the retrieved articles independently according to the eligibility criteria (Table 1). Lastly, reference lists of all included studies were searched for relevant studies meeting our inclusion criteria. The decision to include or exclude a study was based on consensus between two researchers (DC and ÉT). In case of disagreement, a third researcher (CMR) was asked for their input. No review protocol for this study was published. However, the review methods were established before conducting the review.

Data Extraction

Data extraction was conducted by two researchers (DC and ÉT) using a standardized protocol. Extracted data consisted of (1) author and year, (2) country, (3) methodology, (4) timing, (5) population and setting, (6) intervention and comparator, if applicable, (7) outcome measures, and (8) results.

Grading of Evidence

Four design-specific JBI checklists were used to critically appraise the methodological quality of the included studies: (1) randomized controlled trials [34], (2) non-randomized experimental studies [34], (3) qualitative research [35], and (4) cohort studies [36]. These checklists vary from 9 to 13 design-specific questions. In this review, each item was scored as 1 = present, or 0 = absent or unclear. We summed the scores of each checklist to report an overall quality score for each study, with higher scores indicating a higher methodological quality. The quality appraisal of included studies was conducted by two independent researchers (DC and ÉT), and disagreement was resolved through discussions.

Data Analysis

Included studies' analysis was done in two steps: (1) description of the study and training intervention characteristics, and (2) regrouping of interventions by category of similarities in the content and method of training.

Results

Study Selection

Overall, our search strategy yielded 4,797 articles, of which 164 were assessed for eligibility through full-text screening (Fig. 1). We excluded 120 articles for various reasons, leaving 39 studies in 44 articles (Fig. 1). Six

Table 1. Inclusion and exclusion criteria

	Inclusion criteria	Exclusion criteria
Years considered	1 January 1996 to 20 January 2022	Published prior to January 1996
Study design	Qualitative, quantitative, or mixed methods primary studies Process evaluations of included studies	Non-primary studies (e.g., systematic reviews, discussion papers, commentaries) Case studies
Participants	Staff working with elderly residents with a NCD presenting BPSDs (e.g., RN, LPN, orderly) can include other specialized professionals if RN, LPN, or orderly is included	Informal caregiver Patients: residents without a NCD or with a NCD and not presenting BPSDs Young onset dementia
Interventions (and comparators)	• Staff training interventions, implementation of a protocol/programme, or supervisory support aiming BPSD management • Sufficient intervention characteristics to allow evaluation of feasibility and reproducibility (e.g., type of training, length, with or without simulation) • Training content on non-pharmacological interventions (e.g., approach, psychological therapies, communication, and behavioural techniques) or pharmacological interventions including the nurse's role (e.g., administering as needed medication, role of nurses in deprescribing) With or without comparator	Informal caregiver trainings Brief training as part of the implementation of another type of intervention
Outcomes	Outcomes related to the staff training • Presence, frequency, or intensity of BPSDs (globally or individual symptoms) • Rates of antipsychotic use • Rates of restraint use • QoL • Staff competence, knowledge, or psychological well-being	• Outcomes on informal caregivers • Other outcomes
Setting	NH (private, semi-private, or public)	Settings other than NHs (e.g., home, hospital)
Language	English or French	Languages that cannot be read

BPSD, behavioural and psychological symptoms of dementia; LPN, licensed practical nurse; NCD, neurocognitive disorder; RN, registered nurse.

additional records were identified by reference list searching, of which 3 met our inclusion criteria, totalling 39 studies in 47 articles included in the review (Fig. 1).

Characteristics of the Included Studies

The included studies were published between 1997 and 2021, and most used experimental designs (Table 2). Twelve studies measured resident outcomes, seven measured staff outcomes, and 20 measured both (Tables 3, 4).

Of the articles reporting resident outcomes, 31 evaluated BPSDs, either globally or individually. The most common symptoms evaluated were agitation, neuropsychiatric and depressive symptoms, using the Cohen-Mansfield Agitation Inventory (CMAI), the Neuropsychiatric Inventory (NPI), and the Cornell Scale for Depression in Dementia (CSDD), respectively. QoL was assessed in 13 articles, the QoL in late-stage dementia being the most common measure. Psychotropics were assessed in 17 articles and physical restraints in four, most measuring percentages of their use.

Regarding staff outcomes, 11 articles reported on staff psychological well-being, the most common being burnout and distress, measured with the Maslach Burnout Inventory, NPI, and General Health Questionnaire. In addition, 24 articles assessed staff skills, behaviours, and competence, using the Quality of Interactions Schedule, the Approaches to Dementia Questionnaire, and the Sense of Competence in Dementia Care Staff, respectively. Three articles measured job satisfaction, all using different scales. Finally, eight articles measured staff knowledge, related to dementia, BPSDs, and communication using a variety of methods and study-specific scales, most being non-standardized nor validated.

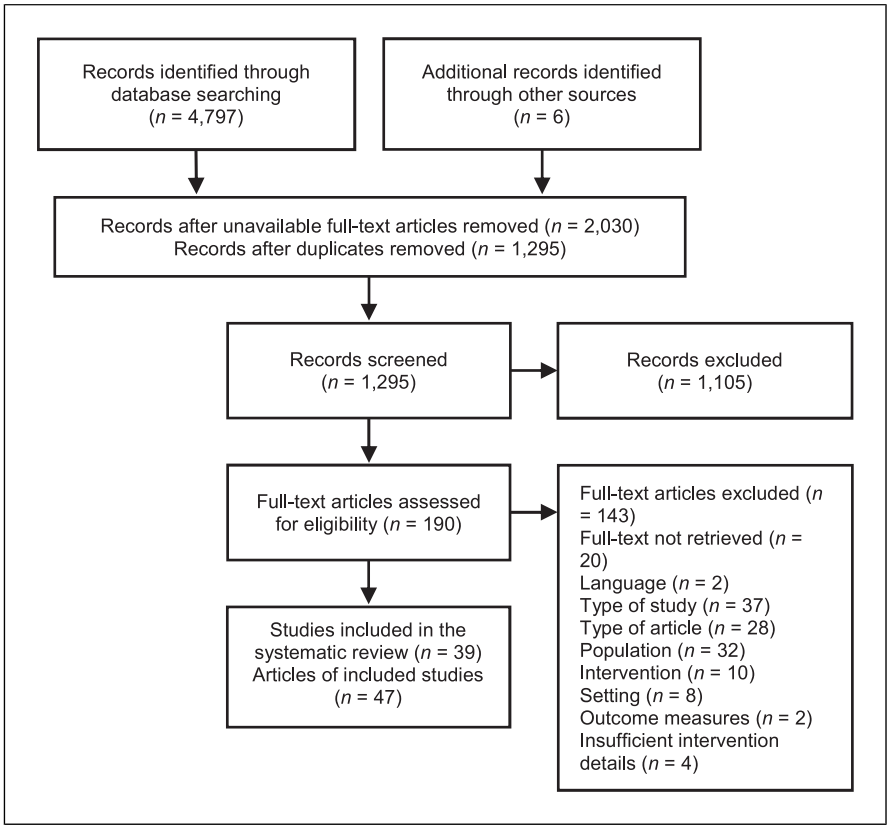

Fig. 1. PRISMA flow diagram.

Types of Staff Training Interventions on BPSD Management

Ten categories of staff training interventions were identified (Table 2) and are described in the subsections below.

1. Structured Protocols and Models

This category pertains to the implementation of structured protocols and models with guidelines aiming BPSD management and included three studies [37–39] (Table 2, Panel 1). These demonstrated overall positive results on both residents (e.g., reduced BPSDs and agitation [37–39]; Table 3, Panel 1) and staff (e.g., reduced general strain, increased self-efficacy [37]; Table 4, Panel 1), with no worsening of indicators. In addition, structured protocols showed a greater reduction in BPSDs when compared to training alone and more efficacy when accompanied by clinical support (CS) (e.g., visits from experienced mental health clinicians) [37] (Table 3, Panel 1).

2. Person-Centred Bathing

Person-centred bathing refers to the appropriate strategies to adopt while bathing a resident with a NCD (e.g., person-centred identification of needs, personalizing care). All studies included in this category were based on the theoretical model of PCC, which includes considering the person with a NCD in a biopsychosocial approach, by seeing them as an equal person that has feelings, desires, rights, and a life story [84]. Three studies assessed person-centred bathing interventions [40–42] (Table 2, Panel 2) and reported improved resident (e.g., decreased agitation and antipsychotic use [41]; Table 3, Panel 2) and staff outcomes (e.g., improved gentleness and verbal support [42]; Table 4, Panel 2), with no worsening of indicators.

3. Communication Techniques

This category includes trainings on the appropriate communication techniques to use with a resident with a NCD (e.g., avoiding infantilizing speech). Five studies [43–47] reported on communication techniques (Table 2, Panel 3). These showed mostly positive results on residents (e.g., reduced resistiveness to care [45] and antipsychotic use [46]; Table 3, Panel 3) and staff (e.g., improved appropriate and effective communication [45, 47], reduced distress [44]; Table 4, Panel 3), with no worsening of indicators.

4. Staff Training for Assisted Living Residences

This category refers to a repeatable, structured training, composed of workshops, individual sessions, and a manual of detailed procedures [85] and included two

Table 2. Characteristics of included qualitative and quantitative studies on staff training interventions aiming the optimal management of BPSDs, by category

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
1. Structured protocols and models							
McCabe et al. [37], 2015	Australia	Cluster RCT	Not specified	Population Residents: dementia, ≥1 significant challenging behaviour (n = 187) Staff: personal care assistants, RNs, ENs, and other (n = 204) Setting: 16 RACFs	• Arm 1: training on structured protocol, educational workshop on BPSDs and PCC, and 3 mo external CS • Arm 2: educational workshop and external CS • Arm 3: training on structured clinical protocol alone • Arm 4: CG receiving CAU	• Changes in resident BPSDs, frequency, and duration (CMAI) • Staff stress (carer stress scale), general strain (SDCS), attitudes (ADQ), perceived skills and confidence (SEDC) Measures pre-intervention, at 3 and 6 mo post-intervention	6/13 [34] 6/13 [34]
Pieper et al. [38], 2016	Netherlands	Cluster RCT, single blind	January 2010 to June 2012	Population Residents: moderate to severe dementia, clinically relevant challenging behaviour (n = 229) Setting: 12 NHs	• Arm 1: comprehensive stepwise multidisciplinary intervention training (STA OP!) composed of five 3-h meetings, with site visits from project coordinator once per wk • Arm 2: training on dementia management, general nursing skills, and pain. No stepwise component. Site visits from the project coordinator once per wk	• Agitation (CMAI) • Psychotropic medication use (ATCC), NPS (NPI-NH), symptoms of depression (CSDD, MDS-DRS) Measures at baseline, 3 and 6 mo post-intervention	10/13 [34] 9/13 [34]
Roberts et al. [39], 2015	Australia	Mixed methods pilot project	May 2011 to February 2013, 18-mo study period	Population Residents: all residents living in the unit, moderate to severe dementia (n = 16) Staff: all unit care staff (n = 18) Setting: 15-bed care memory support unit	Implementation of a composite PCC model composed of 2 days of dementia care educational sessions and 2 days of training on Montessori-based principles and activities (ABLE model). Ongoing support from dementia consultant for 18 mo study period	• Use of antipsychotics or sedatives (medication charts) • Quality of care and quality of residents' lives (DCM) • Frequency of BPSDs (CMAI) • Staff data: care environment, attitudes, knowledge, care organization, and content of care (TURNIP) Measures at baseline (May to June 2011) and in December 2012 to February 2013	7/9 [34] 6/9 [34] 7/9 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
2. Person-centred bathing							
Calleson et al. [40], 2006	USA	Quantitative interventional study with post-intervention measures	Training packages received between January and June 2004	Population Staff: licensed nurses, CNAs, and administrators Setting: all 15,453 USA NHs in the Centers for Medicare and Medicaid Services database	Educational CD-ROM and video programme on "BWAB", composed of the person-centred showering and towel bath techniques, distributed to all USA NHs	• User evaluation of the materials (anonymous surveys) • Exam scores Measures post-intervention	1/9 [34]
Gozalo et al. [41], 2014	USA	Randomized crossover diffusion study with two groups, observed at three points in time	2009 to 2011	Population Residents: dementia, CPS score ≥2, NH resident for ≥90 days (n = 12) Staff: CNAs Setting: 6 NHs	• Arm 1: BWAB implemented using a train-the-trainer model. CNA trainers from each facility attended a 2-day training on resident behavioural expressions of distress during bathing and approaches to avoid distress, the CNA trainers then trained all CNAs of their facilities using BWAB CD-ROM and DVD. • Arm 2: CG receiving delayed intervention	• Physical aggressive and verbal agitated or aggressive behaviour rates during bathing (modified CAREBA) • Use of APM (medication records) • Bath duration and modality Measures pre- and post-intervention	7/13 [34] 6/13 [34]
Hoeffer et al. [42], 2006	USA	Crossover RCT	12 wk (2 × 6 wk trainings)	Population Residents: age ≥55 years old, needing assistance with bathing, dementia, moderate to severe cognitive impairment, frequent aggressivity, or agitation during bathing, capacity to be showered (n = 69) Staff: CNAs (n = 37) Setting: 15 NHs	• Arm 1: person-centred bathing training, first with showering for 6 wk and second with towel bath for 6 wk • Arm 2: reversed treatment order (first with towel bath for 6 wk and second with showering for 6 wk) • Arm 3: standard bathing care, without PCC training	• Staff gentleness and verbal support (CBBRS) • Staff confidence and ease (CES) and hassles (HDBS) Measures at baseline, 6 wk and 12 wk follow-up	6/13 [34] 5/13 [34]
3. Communication techniques							
Levy-Storms et al. [43], 2016	USA	Pre-/post-study	4-wk training	Population Residents: dementia, living in LTCFs (n = 16) Staff: LTCF CNAs caring for dementia residents (n = 16) Setting: 1 LTCF	DVD-based communication training during mealtimes composed of four 1-h in-service sessions on behavioural strategies to communicate with Alzheimer's disease residents	• CNA therapeutic communication behaviours • Residents' response to food Measures videos pre-test and post-test	6/9 [34] 6/9 [34]

Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Sprangers et al. [44], 2015	Netherlands	Two-group comparison design	8-wk study	Population Residents: NH resident, dementia, sufficiently communicative to complete the MMSE (n = 26) Staff: regular NH nursing aides (n = 24) Setting: 2 separate wards in 1 NH	• Arm 1: brief, small-scale communication skills training, aiming improved nursing aides' communication (quality and quantity) towards residents • Arm 2: CG receiving CAU	• Frequency of agitation (CMAI) • Severity of resident psychopathology (NPI-Q) • Nursing aides' communication (CSC, OFGC) • Staff distress (NPI-Q) • Nursing aides' job satisfaction (UWES) Measures pre- and post-intervention	6/13 [34] 6/13 [34]
Williams et al. [45] 2017	USA	Cluster RCT with crossover	2011–2014, 3-wk training	Population Residents: dementia, RTC, long-term stay (n = 27) Staff: permanent NH employees, providing direct resident care, use of elderspeak (n = 29) Setting: 13 NHs	• Arm 1: CHAT communication training composed of three sessions on staff self-monitoring on use of elderspeak and avoiding this type of communication. Offered once per wk for 3 wk • Arm 2: CG, which then crossed over to receive the intervention	• Staff communication and resident behaviours (videorecording behavioural coding) Measures at baseline, post-training, and 3-mo follow-up	7/13 [34]
Shaw et al. [46], 2018 Secondary analysis of Williams et al. [45], 2017	USA	Secondary analysis	Trial from 2011 to 2013	Population Setting and participants: 10 NHs that participated in the cluster RCT from 2011 to 2013	CHAT communication training	• APM (MDS) Medication rates compared for two quarters before and two quarters after the intervention (compared to state averages)	7/13 [34]
Williams et al. [47], 2021	USA	Pilot clinical trial using pre-/post-training measures, crossover design	December 2019 to March 2020	Population Staff: direct care staff (RNs, LPNs, CNAs) communicating with residents daily (n = 141) Setting: 7 NHs	• Arm 1: CHAT Online, interchangeable content with original CHAT, content administered through web-based platform with interactive activities • Arm 2: waitlist CG	• Knowledge of communication in dementia care (scenario-based CHATS) Measures pre-training and post-training for immediate IG and wait-listed CG. • Communication ratings (video-based interaction) Measures at the beginning of module 1 and after completion of module 3	5/13 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
4. Staff Training for Assisted Living Residences							
Da Silva Serelli et al. [48], 2017	Brazil	Prospective pilot study with pre-/post-measures	Training over 6 wk, total data collection 6 mo	Population Residents: elderly LTC residents, dementia (n = 46) Staff: formal LTCF caregivers (n = 25) Settings: 2 LTCFs	STAR, a repeatable, structured training intervention, composed of workshops, individual sessions, and a manual of detailed procedures over 6 wk. The training helps in the identification of relationship and environmental influences that could be modified to improve care and relationships between staff and residents	• Resident QoL (QOL-AD) and behaviour (NPI) • Staff burden (Zarit Scale), depression (BDI), anxiety (BAI), and QoL (SF-36) Measures before intervention and 12 wk after	6/9 [34] 7/9 [34]
Goyder et al. [49], 2012	UK	Experimental group pre-/post-pilot study Phase II exploratory trial	8-wk training, measures at 8-wk follow-up	Population Residents: dementia, clinically significant anxiety, depression, or behavioural problems (n = 31) Staff: care staff (n = 23) Setting: 2 care homes	STAR over 8 wk, including training on the identification of activators, behaviours, and consequences to help understand and modify interactions with residents. The training also included teaching on dementia, communication skills, and the implementation of pleasant activities	• Resident depressive symptoms (CSDD), anxiety (RAID), behavioural problems (RMBPC), and QoL (QOL-AD) • Staff attitudes (ADQ) and sense of competence (SCID) • Acceptability of STAR at follow-up (SSFQ) Measures at baseline and 8 wk follow-up	7/9 [34] 8/9 [34]
5. Case conferences							
Halek et al. [50], 2020 Holle et al. [51], 2019	Germany	Stepped-wedge cluster randomized trial with two open cohorts	Data collection from September 2013 to April 2015, 7-mo intervention	Population Residents: dementia, FAST score >1, living in the unit for ≥15 days (n = 177) Staff: permanent unit RNs and assistant staff (n = 233) Setting: 12 NHs	• Arm 1: dementia-specific case conference model using a standardized assessment tool (IdA) • Arm 2: dementia-specific case conference model using an open thinking method (Neo) • Arm 3: CG, receiving CAU phase	• Change in the prevalence of the residents' behaviours (NPI-NH) • Resident QoL (QUALIDEM) • Psychotropic medications (nursing records) • Staff burnout (CBI), dementia work-related stress (BelaDem) and vocational action competence (KRI) Measures on 7 data points every 3 mo between September 2013 and April 2015	IdA: 9/13 [34] Neo: 10/13 [34] 7/13 [34]

Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Lichtwarck et al. [52], 2018	Norway	Single-blind, cluster RCT with two parallel groups	January to July 2016 3-mo intervention	Population Residents: CDR score ≥ 1, moderate to high agitation, long-term resident residing in the NH ≥ 2 wk (n = 202) Setting: start = 33 NHs, end = 32 NHs	• Arm 1: TIME, a multicomponent biopsychosocial case conference intervention in three phases • Arm 2: CG with brief 2-h education-only intervention on dementia and NPS.	• Agitation, aggression and other NPS (NPI-NH) • Agitation (CMAI), depression (CSDD) and QoL (QUALID) • Psychotropic and analgesic medications (ATCC) Measures at baseline, 8 and 12 wk (or similar time frames)	10/13 [34]
Lichtwarck et al. [53], 2019 Process evaluation of Lichtwarck et al. [52], 2018	Norway	Mixed methods process evaluation, convergent parallel type	Study from January to July 2016 12-mo follow-up	Population Residents: n = 229 Staff: n = 297 Leading ward nurses: n = 42 5 focus groups: n = 32 staff members, physicians, and leaders Setting: start = 33 NHs, end = 32 NHs	• Arm 1: TIME. • Arm 2: CG with brief 2-h education-only intervention on dementia and NPS	• Staff attitudes towards dementia (ADQ), mastery, social interaction, job satisfaction (QPS-Nordic), and self-assessment of competence (Competence Questionnaire) Measures at baseline (before randomization), at 6 and 12 mo	N/A
6. Concept mapping							
Aberdeen and Byrne [54], 2018	Australia	Longitudinal quasi-experimental design with pre- and post-testing	9-mo study	Population Staff: RACF staff (PCWs, ENs, and RNs; n = 102) Setting: start = 15 RACFs, end = 11 RACFs	• Arm 1: team concept mapping ("spider" format), initiated through RNs or ENs who received 1-day training on mapping facilitation, with two follow-up support visits or phone calls from researcher • Arm 2: CG with no training nor intervention All RACF offered their staff a 3-day education package on dementia care before pre-test measures	• Knowledge of dementia and problem-solving (TKPD) • Opinions regarding whether concept mapping was an adequate use of time, staff perceptions on whether participation could improve knowledge and care planning (3-item study-specific scale) • Changes in the quality of residents' care plans (audits) • Quality of all concept maps (audits) Measures pre-intervention and 9 mo post-intervention	7/9 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Surr et al. [55], 2020 Surr et al. [56], 2020	UK	Pragmatic, multicentre, cluster RCT with an open-cohort design	June 2014 to May 2017	Population Residents: living in care home permanently, dementia or FAST ≥ 4, sufficient English proficiency (n = 675) Staff: permanent staff Setting: 50 care homes	• Arm 1: DCM, part of EPIC trial Staff-led intervention, composed of 4-day mapper training on DCM, five-phase DCM cycles with three cycles during the intervention period SMS reminders before each cycle and support from DCM expert for the first cycle, followed by email and phone support • Arm 2: CG receiving CAU	• Resident agitation (CMAI), NPS (NPI-NH), and QoL (QUALID, QOL-AD, DEMQOL, DEMQOL-proxy, EQ-5D-5L, EQ-5D-5L-proxy) • Prescribed and administered medications (medication records) • Quality of staff interactions with residents (QUIS) Measures at baseline, 6- and 16-mo follow-up	8/13 [34] 7/13 [34]
Van de Ven et al. [57], 2013	Netherlands	Open-cohort pragmatic cluster RCT	October 2010 to April 2012	Population Residents: age ≥65 years old, dementia, ≥1 NPS, able to use common areas ≥4 h per day (n = 169 from start to finish, n = 81 new residents included) Staff: nursing caregivers of dementia residents (n = 319 from start to finish, n = 53 new staff included) Setting: 11 care homes	• Arm 1: DCM, organizational DCM briefing day, followed by implementation of two 4-mo DCM cycles, composed of observation, feedback, and action plans by selected and trained care home certified dementia care mappers • Arm 2: CG receiving CAU, offered DCM after the study	• Resident agitation (CMAI), NPS (NPI-NH), QoL (QUALIDEM, EuroQol-5D) • Staff stress (GHQ-12), job experience and satisfaction (QEAW, MJSS-HC) Measures at baseline and two follow-ups at intervals of 4 mo	7/13 [34] 6/13 [34]
6.1 DCM compared to PCC							
Chenoweth et al. [58], 2009	Australia	Cluster RCT	2005 to 2007 4-mo intervention and 4-mo follow-up	Population Residents: dementia, age ≥60 years old, high dependency, need-driven behaviours, permanent long-term care residents (n = 236) Setting: 15 RACFs	CADRES study • Arm 1: PCC, 2-day training session on PCC exploring the impact of staff on resident behaviours, and staff support by two site visits and regular telephone contact during the 4-mo intervention • Arm 2: DCM, selected staff from each site were trained in concept mapping; trained staff then assisted RACF staff in the implementation of person-centred care plans during the 4-mo intervention period and obtained regular support by telephone • Arm 3: CG, receiving CAU	• Resident agitation (CMAI), psychological and psychiatric behaviours (NPI-NH) • QoL (QUALID) • Information regarding five medicines given in the past mo (medical records) Measures at baseline, directly after the 4 mo of intervention, and at 4-mo follow-up	8/13 [34]

Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Jeon et al. [59], 2012 Staff outcomes of Chenoweth et al. [58], 2009	Australia	Cluster RCT	2005 to 2007, 15 mo 4-mo intervention and 4-mo follow-up	Population Staff: permanent direct care and managerial staff, working in study RACFs for ≥6 mo (n = 124) Setting: 15 RACFs	CADRES study • Arm 1: PCC • Arm 2: DCM • Arm 3: CG receiving CAU	• Staff burnout (MBI-HSS), psychological distress (GHQ-12), attitudes and reactions (NPI-NH), and perceptions of managerial support (3-item measure developed by authors) • Quality of care interactions (QUIS) Measures at baseline, directly after the 4 mo of intervention, and at 4 mo follow-up	7/13 [34]
Stein-Parbury et al. [60], 2012 Report on PCC arm in Chenoweth et al. [58], 2009	Australia	Report following temporal sequence of the PCC intervention arm of the CADRES cluster RCT	Not specified	Population Residents: residents in PCC arm of the study (n = 77) Staff: staff from the PCC arm of the study (n = 10) Setting: 5 RACFs in the PCC arm of the study	PCC intervention arm from the CADRES study *Compared to DCM and CAU in original RCT	• Written evaluations of the course (open-ended questions about what they learned, good aspects of the training, areas of uncertainty and for suggestions) Evaluation at the end of the training	2/10 [35]
Rokstad et al. [61], 2013	Norway	Three-armed cluster RCT	January to December 2011, 10 mo	Population Residents: dementia (n = 446) Setting: 14 NHs	• Arm 1: DCM; selected care staff from each NH were trained and certified as DCM mappers, and rest of staff were offered a 3-h lecture on PCC and DCM • Arm 2: VPM, PCC intervention, composed of 45–60-min weekly NH meetings using the VIPS framework to analyse staff-resident interactions. Lead NH nursing staff were trained to become VPM coaches and then provided a 3-h introduction to PCC and VPM to the other NH staff. A manual with stories was provided to all staff • Arm 3: CG receiving DVDs (5 × 30 min) containing lectures on dementia	• Resident agitation (BARS), NPS (NPI-Q), depression (CSDD), and QoL (QUALID) Measures at baseline and at 10 mo (follow-up)	DCM and control: 8/13 [34] VPM: 7/13 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
7. Emotion-oriented approaches							
Chrzescij-anski et al. [62], 2007	Australia	Simple interrupted time series, with resident acting as their own control	Conducted in 2003 14-day observation period, measures until 6-wk follow-up	Population Residents: MMSE score ≤20, dementia, aggressive behaviours (n = 43) Staff: staff working in RACFs (n = 59) Setting: 4 RACFs	ERIC training, a staff education programme on aggression composed of a 40-min video training on emotions expressed by dementia residents	• Staff attitudes regarding their work (AESMICS) • Resident aggression (BAGSAS) 14-day aggressive behaviour observation period, staff attitudes assessed before intervention, and 6 wk after	6/9 [34]
Magai et al. [63], 2002	Not mentioned	Cluster RCT	Training over 2 wk, measures until 12 wk post-intervention	Population Residents: mid-to-late-stage dementia residents in NHs (n = 91) Staff: NH staff caregivers of these residents (n = 20) Setting: 3 NHs	• Arm 1: training on sensitivity to non-verbal emotion signals, composed of ten 1-h sessions over 2 wk • Arm 2: training on behavioural and cognitive aspects of dementia, composed of ten 1-h sessions over 2 wk • Arm 3: waitlist CG with no treatment	• Resident BPSDs (BEHAVE-AD), agitation (CMAI), depression (CSDD), and facial expressions of emotion (MAX coded) • Staff well-being (BSI) Measures at baseline and 3, 6, 9, and 12 wk post-intervention	8/13 [34] 7/13 [34]
8. Medication review or antipsychotic use education							
Ballard et al. [64], 2016	UK	Factorial (2 × 2 × 2) cluster RCT with two replications	9 mo Recruitment and randomization between August and December 2011	Population Residents: dementia (CDR score ≥ 1), FAST ≥4 (n = 195) Setting: 15 NHs	WHELD program Interventions (some combined) • PCC training (delivered to all staff) • Antipsychotic review by physicians having been invited to an interactive seminar and/or practice meeting • Social interaction composed of developing individualized care plans • Exercise composed of personalized exercise plan according to resident interests	• Resident APM use (BNF), agitation (CMAI), depression (CSDD) • Overall NPS (NPI-NH) Measures at baseline (before randomization) and 9-mo follow-up	9/13 [34] 8/13 [34]

Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Ballard et al. [65], 2018	UK	Cluster RCT two-arm trial	January 2013 to September 2015, 9-mo intervention	Population Residents: dementia (CDR score $\geq$ 1), minimum level of functional, cognitive, and neuropsychiatric features (n = 553) Setting: 69 NHs	• Arm 1: WHELD, a staff training on PCC, social interaction, and APM (antipsychotic review), followed by delivery in an ongoing manner using a care staff champion model • Arm 2: CG receiving CAU.	• Resident QoL (DEMQOL-Proxy), agitation (CMAI), NPS (NPI-NH), APM use (medication charts), and mood (CSDD) • Quality of interactions (QUIS) Measures at baseline (before randomization) and after the 9-mo intervention	8/13 [34]
Maidment et al. [66], 2018	UK	Open-label (non-blinded), mixed methods feasibility study with embedded process evaluation	January 2015 to December 2017	Population Residents: dementia, living in care homes, receiving psychotropics for behaviours that challenge (n = 29 received medication review, n = 9 at 9-mo follow-up) Staff: n = 164 received training and n = 21 interviewed Setting: 5 care homes	MEDREV, a pharmacy-health psychology intervention on people with dementia with behaviours that challenge, including a full clinical medication review performed by a pharmacist specialized in dementia care in combination with a behavioural change training intervention informed by health psychology	• Expectations and experiences of care home staff, including managers, and GPs (individual interviews) • Reflective comments regarding aspects that were helpful, barriers and facilitators (phone interview)	N/A
Maidment et al. [67], 2020	UK	Open-label (non-blinded), mixed methods feasibility study with embedded process evaluation	January 2015 to December 2017	Population Residents: dementia, living in care homes, receiving psychotropics for behaviours that challenge (n = 29 received medication review) Setting: 5 care homes	MEDREV	• Behaviours that challenge/ BPSDs (NPI-NH) • QoL (EQ-5D-5 L/DEMQoL) • Prescribed medication Data collection at baseline, at 3 and 6 mo after the medication change, compared to participants with medication change	N/A
Van der Spek et al. [68], 2018	Netherlands	Cluster RCT pragmatic trial using parallel groups	September 2012 to July 2014, 18-mo study	Population Residents: dementia, admitted for long-term stay (n = 272) Setting: start = 13 LTCFs, end = 12 LTCFs	• Arm 1: PROPER II study, composed of multidisciplinary biannual medication review that is structured and repeated, education and continuous evaluation to support the medication review • Arm 2: CG receiving CAU	• Level of appropriateness of psychotropic drug use • Appropriateness of indication, evaluation, and therapy duration (APDDI) Medical files assessed at baseline, 6, 12, and 18 mo	6/13 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Smeets et al. [69], 2020 Secondary outcomes of Van der Spek et al. [68], 2018	Netherlands	Cluster RCT with two parallel groups, open cohort	September 2012 to July 2014, 18-mo study	Population Residents: dementia (n = 186 from baseline to finish, n = 323 completed final assessment) Setting: start = 13 LTCFs, end = 12 LTCFs	• Arm 1: PROPER II study • Arm 2: CG receiving CAU	• Prescriptions of antipsychotics, antidepressants, anxiolytics, and hypnotics (medical files and medication charts) • Occurrence of NPS (NPI-Q, CMAI) Measures at baseline, 6, 12, and 18 mo	7/13 [34] 6/13 [34]
Vida et al. [70], 2012	Canada	Quasi-experimental cohort study using a pre-/post-intervention design	2009, 5-mo duration	Population Residents: dementia, living in the LTCF, receiving regular APM (n = 46) Setting: Donald Berman Maimonides Geriatric Centre in Montreal	Interdisciplinary education programme for antipsychotic use in dementia, composed of two 60–90-min lectures on (1) pharmacological and (2) non-pharmacological approaches to BPSDs	• Proportions of APM dose reductions and discontinuations • Proportion of residents regularly prescribed APM (pharmacy records) • Frequency of disruptive behaviours (NHBPS) Measures at baseline and 4–5-mo post-educational programme	7/9 [34] 6/9 [34]
9. MARQUE							
Livingston et al. [71], 2019	UK	Parallel group, superiority, single-blind, cluster RCT	Randomization between June 2016 and July 2017, measures at 8 mo	Population Residents: dementia or probable dementia with positive screening score on NPC (n = 318) Staff: providing face-to-face care to dementia residents and working during the day (n = 354) Setting: 20 care homes	• Arm 1: MARQUE, a manualized evidence-based intervention, delivered to staff in six interactive sessions by supervised graduate psychologists, including getting to know the resident with dementia, integrating pleasant activities in daily care, improving communication, etc. This was followed by implementation and supervision periods • Arm 2: CG receiving CAU	• Resident agitation (CMAI), NPS (NPI), QoL (DEMQOL, EQ-5D-5L) • Psychotropic medication (prescriptions) • Staff burnout (MBI), subjective competence (SCID), potentially abusive and positive staff behaviours (Staff Tactics Scale) Measures at baseline and 8 mo	10/13 [34] 9/13 [34] 7/13 [34]

Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Laybourne et al. [72], 2021 Follow-up 2 years after intervention in Livingston et al. [71], 2019	UK	Qualitative study	20–30-mo post-MARQUE trial in Livingston et al. (2019)	Population Staff: nurses, senior carers, deputy or unit managers, activity coordinators, administrators (n = 25) Setting: 6 NHs from intervention arm of study conducted by Livingston et al. [71], 2019	Long-term implementation of MARQUE	• Practice change: communication, respect, and understanding of roles, ability to try new things (individual and group interviews)	9/10 [35]
Sampson et al. [73], 2021	UK	Mixed methods, non-randomized feasibility study	14-wk study, intervention from wk 7 to 10	Population Residents: dementia, score ≥2 on NPC or rated as "severe" on CDR scale (n = 26) Staff: employed permanently, qualified nurses, healthcare assistants, or activity coordinators (n = 44) Focus group staff: healthcare assistants, assistant nursing practitioners, unit manager, clinical lead, and NH managers (n = 19) Setting: 3 NHs	Part of the MARQUE programme, a manualized training, delivered by non-clinical psychology graduates that focused on agitation in severe dementia	• Resident agitation (CMAI) and QoL (DEMQOL-Proxy, QUALID, EQ-5D 5L-Proxy) • Staff subjective competence (SCID) • Quality of interactions (QUIS) Measures before intervention (wk 1–6) and follow-up after intervention (wk 11–14) Qualitative interviews • Focus groups with NH staff to explore their views on the training, manuals, barriers, and facilitators	7/9 [34] 8/10 [35]
10. Appropriate use of physical restraints							
Testad et al. [74], 2005	Norway	Single-blind cluster RCT	7-mo intervention	Population Residents: n = 142 Staff: entire group of staff (loss of n = 14 in IG and n = 22 in CG) Setting: 4 NHs	• Arm 1: structured and sustained staff training program on dementia and restraint use, consisting of a seminar and guidance monthly over 6 mo • Arm 2: CG receiving CAU	• Number of restraints (standardized interview with charge nurse) • Agitation (BARS) Measures before and immediately after the intervention	6/13 [34]
Testad et al. [75], 2010	Norway	Single-blind RCT	2003 to 2004, 6-mo intervention	Population Residents: dementia, FAST score ≥ 4 (n = 90) Staff: care staff (RNs, LPNs, CNAs; n = 109) Setting: 4 public NHs	• Arm 1: educational intervention of relation-related care, 2-day training with monthly group guidance for 6 mo • Arm 2: CG receiving CAU	• Agitation (CMAI) • Use of restraints and their frequency (standardized interview) • Use of APM Data collected immediately pre- and post-6-mo intervention, as well as 6 mo later (12-mo follow-up)	7/13 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Testad et al. [76], 2016	Norway	Single-blind cluster RCT	January 2011 to May 2013, 7-mo intervention	Population Residents: dementia (n = 197) Setting: 24 care homes	• Arm 1: MEDCED, the "Trust Before Restraint" intervention, 7-mo education intervention composed of a seven-step guidance group and a training manual presented through a seminar. Implemented through clinical research nurse facilitators • Arm 2: CG receiving CAU, offered intervention after study period	• Use of restraint (standardized interview with care staff) • Agitation (CMAI, NPI) • Use of psychotropic drugs (medical journal) Measures at baseline and at 7 mo	6/13 [34]
11. Other types of trainings							
Cohen-Mansfield et al. [77], 1997	USA	Pre-test/post-test non-experimental design with no CG	Measures from 1 wk pre-intervention to 1 mo after	Population Staff: staff from NHs with cognitively impaired patients who wandered or paced, all shifts (n = 103) Settings: 4 NHs	Forty-minute (1 day) in-service training program on dementia, pacing, and wandering	• Nursing staff knowledge on dementia, wandering/pacing, and management strategies (knowledge quiz designed for this study) • Staff's satisfaction, perception of their work difficulty, and the quality of care (SSQ) • Residents' behaviour (observation) Measures 1 wk before the training, directly after the training, and 1 mo after the training	7/9 [34] 6/9 [34]
Deudon et al. [78], 2009	France	Cluster RCT 2 (intervention conditions) x 3 (assessments) nested partial crossover CG design	Intervention from October to December 2007, 8-wk intervention, 3-mo follow-up in March 2008	Population Residents: dementia, MMSE score ≤24, ≥1 BPSD at least once per wk (n = 272) Setting: 16 NHs	• Arm 1: staff education and training program lasting 8 wk, composed of a 90-min education session on dementia, BPSDs, and how to use the four instruction cards containing guidelines on what to do and not do when faced with specific BPSDs. Support from trainers as coaches for 2 mo • Arm 2: CG receiving CAU	• Behavioural symptoms (NPI-NH, CMAI, OS score) Measures at baseline, end of the intervention period (wk 8), and 12-wk follow-up (wk 20)	8/13 [34]

Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Elpers et al. [79], 2017	USA	Pilot study, single-case design with pre-/post-training measurements	6-wk intervention	Population Staff: direct caregiving staff (CNAs, RNs, LPNs; n = 7) Setting: 1 LTCF	Psycho-educational staff training composed of three 30-min psycho-educational in-service trainings, on dementia, instructions, and opportunities to practice management skills on five behavioural problems	• Staff attitudes towards dementia (ADQ) Measures pre- and post-test	6/9 [34]
Fukuda et al. [80], 2018	Japan	Cluster quasi-randomized controlled comparative trial	June 2014 to January 2016	Population Staff: nurses, occupational therapists, and clinical psychologists working ≥ 4 days per wk in LTCFs, length of service > 1 year (n = 357) Setting: 17 facilities	• Arm 1: educational intervention using printed educational material based on Guidelines for Initial Coping with BPSD, composed of a 30-min lecture on BPSDs, and a 90-min training on how to properly use the guidelines • Arm 2: CG receiving CAU	• Staff distress (NPI) • Caregiver burnout (MBI) Outcome measures at baseline and 1 mo after baseline	8/9[34]
Leone et al. [81], 2013	France	Cluster RCT	4-wk intervention, 3-mo follow-up (17 wk)	Population Residents: dementia, MMSE <24, presence of apathy (n = 203) Staff: psychologists, doctors, nurses, practical nurses, agents of hospital service (n = 141) Setting: 16 NHs	• Arm 1: STIM-EHPAD teaching program for care staff, including a 2-h training on Alzheimer's disease and BPSDs, and 4-h trainings weekly for 1 mo on methods and practical advice for managing apathy and depression • Arm 2: CG receiving CAU	• Resident apathy (AI) and behavioural disturbances (group and individual OS) • Resident NPS (NPI-NH) Measures at baseline, post-training, and at 3-mo follow-up (at wk 17) • Staff knowledge and perceptions about BPSDs (NHBSMQ) At baseline and after intervention in IG.	6/13 [34] 4/13 [34] 6/13 [34]
Visser et al. [82], 2008	Australia	Cluster RCT	8-wk intervention	Population Residents: displayed regularly ≥ 1 CMAI behaviour (n = 76) Staff: aged care facility staff (n = 52) Setting: 3 aged care facilities	• Arm 1: education only, composed of an 8-wk training program on dementia and behavioural symptoms, and behavioural model-based workshops • Arm 2: education and peer support for 30 min after the education sessions over 4 wk, aiming to reinforce learned materials and positive staff member changes • Arm 3: waitlist CG	• Resident behavioural symptoms (CMAI) and QoL (ADRQL) • Staff attitudes, perceptions, and thoughts about their carer role (SAQ), burnout (MBI) Measures pre- and post-intervention, at 3- and 6-mo follow-up	4/13 [34] 5/13 [34]

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Table 2 (continued)

Author, year	Country	Methodology	Timing	Population (n =) Setting	Intervention arms	Outcome measures (data collection method)	QAS
Reinhardt et al. [83], 2020	USA	Retrospective comparison	6-day training, 6-mo period Sample of residents living in the NH between January 2014 and April 2017	Population Residents: residents in two PDC communities (n = 72) and residents in three traditional communities (n = 72), matched in acuity and cognitive status Setting: 2 PDC communities and 3 traditional communities within 1 large NH	• Arm 1: PDC training in PDC communities • Arm 2: PDC training in traditional NH communities The PDC 6-day training consisted of getting to know the resident to anticipate their individualized needs and meet them, using a positive approach, enhancing communication, etc	• Clinical care symptoms: depression, behavioural agitation over the past 1 wk, and rejection of care (MDS) Measures over a period of 6 mo	7/11 [36]

ABLE, (A) abilities and capabilities of the resident, (B) background of the resident, (L) leadership, cultural change and education, (E) physical environment changes; ADQ, Approaches to Dementia Questionnaire; ADRQL, Alzheimer's Disease-Related Quality of Life; AESMICS, Attitude to Elderly Severely Mentally Infirm Care Scale; AI, Apathy Inventory; APDDI, Appropriate Psychotropic Drug use In Dementia Index; APM, antipsychotic medication; ATCC, Anatomical Therapeutic Chemical Classification; BAI, Beck's Anxiety Inventory; BAGSAS, BAGS Aggression Scale; BARS, Brief Agitation Rating Scale; BDI, Beck's Depression Inventory; BEHAVE-AD, Behavioral Pathology in Alzheimer's Disease Rating Scale; BelaDem, Dementia-Specific Burden instrument; BNF, British National Formulary; BPSD, behavioural and psychological symptoms of dementia; BSI, Brief Symptom Inventory; BWAB, Bathing Without a Battle; CADRES, Caring for Aged Dementia Care Resident Study; CAREBA, Care Recipient Behavior Assessment; CAU, care as usual; CBBRS, Caregiver Bathing Behavior Rating Scale; CBI, Copenhagen Burnout Inventory; CDR, Clinical Dementia Rating; CES, Care Effectiveness Scale; CEU, Continuing Education Units; CG, control group; CHAT, Changing Talk; CHATS, Changing Talk Scale; CMAI, Cohen-Mansfield Agitation Inventory; CNA, certified nursing assistant; CPS, Cognitive Performance Scale; CS, clinical support; CSC, Communication Skills Checklist; CSDD, Cornell Scale for Depression in Dementia; DCM, dementia care mapping; DEMQOL, Dementia-Specific, Quality of Life Questionnaire; DICE, Describe, Investigate, Create, Evaluate; ENs, enrolled nurses; EPIC, Enhancing Person-Centred Care in Care Homes; EQ-5D-5L, EuroQol-5 Dimensions, five-level version/5-item measure of health status; ERIC, Emotional Responses as Quality Indicators; FAST, Functional Assessment Staging; GHQ-12, General Health Questionnaire 12-items; HDBS, Hassles During Bathing Scale; IdA, innovative dementia-oriented assessment system; IG, intervention group; KRI, Competence-Reflection Inventory; LPN, licensed practical nurse; LTCF, long-term care facility; MARQUE, Managing Agitation and Raising Quality of Life; MBI, Maslach Burnout Inventory; MBI-HSS, Maslach Burnout Inventory-Human Services Survey; MDS, Minimum Dataset; MDS-DRS, Minimum Dataset Depression Rating Scale; MEDCED, Modeling and Evaluating Evidence-Based Continuing Education Program in Nursing Home Dementia Care; MJSS-HC, Maastricht Job Satisfaction Scale for Healthcare; MMSE, Mini-Mental State Examination; mo, month; N/A, not applicable; Neo, narrative approach; NH, nursing home; NHBPS, Nursing Home Behavior Problems Scale; NHBSMQ, Nursing Home Behavioral Symptom Management questionnaire; NPC, Noticeable Problems Checklist; NPI, Neuropsychiatric Inventory; NPI-NH, Neuropsychiatric Inventory-Nursing Home Version; NPI-Q, Neuropsychiatric Inventory Questionnaire; NPSs, neuropsychiatric symptoms; OFGC, Observation Form of General Communication; OS, observational scale; PAINAD, Pain Assessment in Advanced Dementia; PAS, Pittsburgh Agitation Scale; PCC, person-centred care; PCW, personal care workers; PDC, person-directed care; PROPER, PRescription Optimisation of Psychotropic drugs in Elderly nuRsing home patients with dementia; QALY, quality-adjusted life-years; QAS, quality appraisal score; QEAW, Questionnaire about Experience and Assessment of Work; QoL, quality of life; QOL-AD, Quality of Life – Alzheimer's Disease Scale; QPS-Nordic, The General Nordic Questionnaire for Psychological and Social Factors at Work; QUALID, quality of life in late-stage dementia; QUIS, Quality of Interactions Schedule; RACF, residential aged care facilities; RAID, Rating Anxiety in Dementia Scale; RCT, randomized controlled trial; RMBPC, Revised Memory and Behavioral Problem Checklist; RN, registered nurse; RTC, resistiveness to care; SAQ, Staff Attitudes Questionnaire; SCID, Sense of Competence in Dementia Care Staff; SDCS, Strains in Dementia Care Scale; SEDC, self-efficacy of dementia care; SF-36, Generic Questionnaire for Evaluating Quality of Life; SMEOLD, Symptom Management at the End-of-Life in Dementia; SSFQ, STAR Staff Feedback Questionnaire; SSQ, Staff Satisfaction Questionnaire; STAR, Staff Training for Assisted Living Residences; TIME, Targeted Interdisciplinary Model for Evaluation and Treatment of Neuropsychiatric Symptoms; TKPD, test of knowledge and problem-solving ability for dementia care; TURNIP, Tool for Understanding Residents' Needs as Individual Persons; UWES, Utrecht Work Engagement Scale; VIPS, (V) valuing people with dementia, (I) individualized care, (P) understanding the world from the patient's perspective, and (S) providing a social environment that supports the needs of the patient; VPM, VIPS practice model; wk, week; WHELD, Well-being and Health for People with Dementia. only outcomes measures and their associated results responding to the eligibility criteria of the review were included in the included studies table.

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Table 3. Resident outcomes regarding intervention efficacy, by category

Author, year	BPSDs[a]	QoL[b]	Psychotropics[c]	Physical restraints[d]
1. Structured protocols and models				
McCabe et al. [37], 2015	↓ agit*	--	--	--
Pieper et al. [38], 2016	↓ agit.*, ↓ NPS**, and ↓ dep.**	--	↓ antidepressants*	--
Roberts et al. [39], 2015	↓ agit**	--	↓ antipsychotics and ↓ sedatives[e]	--
2. Person-centred bathing				
Gozalo et al. [41], 2014	↓ agit. and aggressivity**	--	↓ antipsychotics**	--
3. Communication techniques				
Levy-Storms et al. [43], 2016	∅ change resident refusals	--	--	--
Sprangers et al. [44], 2015	∅ change agit. or NPS	--	--	--
Williams et al. [45], 2017	↓ RTC post-intervention*, non-sig. at 3 months	--	--	--
Shaw et al. [46], 2018	--	--	↓ antipsychotics*	
4. STAR				
Da Silva Serelli et al. [48], 2017	↓ NPS*	↓ QoL (worsening)*	--	--
Goyder et al. [49], 2012	↓ behavioural problems* ↓ dep.*	∅ change QoL	--	--
5. Case conferences				
Halek et al. [50], 2020	IdA: ↓ apathy*, ∅ change other NPS	*IdA* Severe dementia: positive changes in care relationship*, positive affect*, and social isolation* Less severe dementia: ↓ positive self-image*	*IdA*: ∅ change psychotropics	--
	Neo: ↓ eating disturbances* ↓ sleep disturbances* ↓ hallucinations* and ↓ delusions* ∅ change other NPS	*Neo* Severe dementia: ↑ positive affect* Less severe dementia: negative changes in care relationship*, positive affect*, positive relations*, and self-image* ↓ QoL*	*Neo*: ∅ change psychotropics	-- --

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Table 3 (continued)

Author, year	BPSDs[a]	QoL[b]	Psychotropics[c]	Physical restraints[d]
Lichtwarck et al. [52], 2018	↓ agit.***, ↓ disinhibition*, ↓ delusions*, and ↓ dep**		∅ change psychotropic or analgesic medications	
6. Concept mapping				
Surr et al. [55], 2020 Surr et al. [56], 2020	∅ change agit. or NPS	∅ change QoL	∅ change antipsychotics, analgesics, or antidepressants	--
Van de Ven et al. [57], 2013	∅ change agit ↑ NPS (worsening)*	↓ QoL (worsening) in IG and CG**	--	--
6.1 Concept mapping compared to PCC				
Chenoweth et al. [58], 2009	DCM: ↓ agit. compared to CG* ∅ change NPS	*DCM*: ∅ change QoL	*DCM*: ∅ change APM doses	--
	PCC: ↓ agit.** and ↓ NPS*	*PCC*: ∅ change QoL	*PCC*: higher APM doses** compared to DCM and CG	--
Rokstad et al. [61], 2013	DCM: ↓ NPS** ∅ change agit. or dep	*DCM*: ↑ QoL*	--	--
	VPS: ↓ NPS** and ↓ dep.* ∅ change agit	*VPS*: ∅ change QoL	--	--
7. Emotion-oriented approaches				
Chrzescijanski et al. [62], 2007	↓ frequency aggressive episodes[e]	--	--	--
Magai et al. [63], 2002	∅ change BPSD, agit., or dep ↑ positive affect* at 6-week follow-up, ↓ negative affect for all groups*	--	--	--
8. Medication review or antipsychotic use education				
Ballard et al. [64], 2016	*Antipsychotic review*: ↑ NPS (worsening)* ∅ change agit. or dep	--	*Antipsychotic review*: ↓ APM**	--
	Antipsychotic review and social interaction: ↓ NPS* ∅ change agit. or dep	--	--	--
	Exercise: ↓ NPS* ∅ change agit. or dep	--	*Exercise*: ∅ change APM	--
	Social interaction: ↑ NPS (worsening)* ∅ change agit. or dep	--	*Social interaction*: ∅ change APM	--
		↑ QoL**	∅ change APM	--

Table 3 (continued)

Author, year	BPSDs[a]	QoL[b]	Psychotropics[c]	Physical restraints[d]
Ballard et al. [65], 2018	↓ agit.** and ↓ NPS*** ∅ change mood			
Maidment et al. [67], 2020	↑ NPS (worsening)*	Tendency towards ↓ QoL (worsening)[e]	--	--
Van der Spek et al. [68], 2018	--	--	Average improvement in appropriateness of psychotropic drug use** ↓ therapy duration*	--
Smeets et al. [69], 2020	∅ change NPS or agit	--	↑ psychotropic drug prescriptions[e]	--
Vida et al. [70], 2012	∅ change disruptive behaviours	--	21.7% APM discontinuations, 15.2% dose ↓ and 15.2% unsuccessful discontinuations or dose ↓[e]	--
9. MARQUE				
Livingston et al. [71], 2019	∅ change agit. or NPS	∅ change QoL	∅ change antipsychotics	--
Sampson et al. [73], 2021	↓ agit[e]	↑ QoL[e]	--	--
10. Appropriate use of physical restraints				
Testad et al. [74], 2005	↑ agit. (worsening)*	--	--	↓ restraint use*
Testad et al. [75], 2010	↓ agit.*		∅ change antipsychotics	↓ interactional restraints*, difference between IG and CG no longer sig. at 12-month follow-up
Testad et al. [76], 2016	↑ NPS (worsening)** ↓ agit.*, greater ↓ in CG	--	∅ change antipsychotics and antidepressants	↓ any restraint* & ↓ structural restraint**, with greater ↓ in CG
11. Other types of trainings				
Cohen-Mansfield et al. [77], 1997	--	--	--	↑ restraints[e]
Deudon et al. [78], 2009	↓ global agit.*** ↓ behavioural symptoms*** ∅ change NPS	--	--	--
Leone et al. [81], 2013	↑ affective and psychotic symptoms (worsening) at 4-week follow-up**, no longer sig. at week 17 Improvement emotional blunting*	--	∅ change psychotropic, antidepressant, anxiolytic, or antipsychotic drug prescriptions	--

Table 3 (continued)

Author, year	BPSDs[a]	QoL[b]	Psychotropics[c]	Physical restraints[d]
Visser et al. [82], 2008	∅ change agit	∅ change QoL	--	--
Reinhardt et al. [83], 2020	↓ clinical care symptoms in PDC group[e]	--	--	--

Agit, agitation; APM, antipsychotic medications; BPSD, behavioural and psychological symptoms of dementia; CG, control group; DCM, dementia care mapping; Dep., depressive symptoms; IdA, innovative dementia-oriented assessment system; IG, intervention group; MARQUE, Managing Agitation and Raising Quality of Life; Neo, narrative approach; NPSs, neuropsychiatric symptoms; PCC, person-centred care; PDC, person-directed care; QoL, quality of life; RTC, resistiveness to care; Sig., statistically significant; STAR, Staff Training for Assisted Living Residences; VPM, VIPS practice model. $*p \leq 0.05$. $**p \leq 0.01$. $***p \leq 0.001$. –No results reported on this outcome. ↑: increase. ↓:decrease. ∅: no change. Results related to post-intervention and follow-up measures in the main intervention arm(s) were reported unless specified otherwise. [a]BPSDs refer to BPSDs globally or individual symptoms. For global BPSDs, we also included NPSs, and for more specific symptoms, we included agitation, depressive symptoms, mood, apathy, anxiety, behavioural problems, resistance to care, and psychological and psychiatric behaviours. [b]QoL refers to resident QoL. [c]Psychotropics refer to the use of APMs, sedatives and hypnotics, antidepressants, and the appropriateness of these medications. [d]Physical restraints refer to physical restraints, including structural and interactional restraints. This category does not include chemical restraints. [e]No p value reported.

studies [48, 49] (Table 2, Panel 4). These showed varied results on residents (e.g., decreased BPSDs [48, 49] and depressive symptoms [49], no improvement in QoL in one study [49], and worsening in another [48]; Table 3, Panel 4) and staff (e.g., improved hopefulness [49], no significant changes in anxiety and depression [48]; Table 4, Panel 4).

5. Case Conferences

Case conferences refer to systematic objective-oriented meetings with care staff, to discuss care problems [86]. Two studies [50, 52] and their process evaluations [51, 53] were included in this category (Table 2, Panel 5). The efficacy of case conference trainings on resident outcomes varied across studies (e.g., no changes in overall BPSDs [50], reduced agitation and depressive symptoms [52]; Table 3, Panel 5), with little effects on staff outcomes (e.g., decreased work-related burnout [50], no difference in attitudes or perceived competence [53]; Table 4, Panel 5).

6. Concept Mapping

Concept mapping refers to team-based problem-solving that includes multifocal evaluation of BPSD causes, critical analysis of the evaluation results, and consequent care planning, which is then represented visually. Three studies, in four articles [54–57] reported on the efficacy of this category and two additional studies, reported in four articles [58–61] compared the efficacy of person-centred concept mapping to PCC (Table 2, Panel 6). This category reported mixed findings on residents (e.g., no significant improvement in agitation or neuropsychiatric symptoms [55–57], decreased agitation and psychosis [61]; Table 3, Panel 6) and certain positive findings on staff (e.g., increased knowledge [54], reduced emotional exhaustion [59]; Table 4, Panel 6).

7. Emotion-Oriented Approaches

Emotion-oriented approaches include interventions on the non-verbal emotional signals manifested by residents with a NCD (e.g., meaning of non-verbal signals) and included two studies [62, 63] (Table 2, Panel 7). These reported mixed outcomes on residents (e.g., decreased frequency of aggression [62], no significant effects on BPSDs and depression [63]; Table 3, Panel 7) and staff (e.g., decreased symptomatology [63], no change in staff attitudes [62]; Table 4, Panel 7).

8. Medication Review or Antipsychotic Use Education

This category refers to trainings on medication reviews (including the nurse's role) or education on antipsychotic use and included five studies in seven articles [64–70] (Table 2, Panel 8). The efficacy of this category varied across studies on resident (e.g., worsened BPSDs [64], improved agitation and overall BPSDs [65]; Table 3,

Table 4. Staff outcomes regarding intervention efficacy, by category

Author, year	Psychological well-being[a]	Skills, behaviours, and competence[b]	Job satisfaction[c]	Knowledge[d]
1. Structured protocols and models				
McCabe et al. [37], 2015	↓ stress** and ↓ strain*	↑ self-efficacy** ∅ change attitudes	--	--
Roberts et al. [39], 2015	--	↑ positive care environment***, ↑ care organization*, and ↑ care content***	--	↑ dementia knowledge**
2. Person-centred bathing				
Calleson et al. [40], 2006	--	High quality and effectiveness ratings[e]	--	High exam scores[e]
Gozalo et al. [41], 2014	--	↑ in-bed baths*** ↓ duration shower*, tub bath***, and in-bed baths***	--	--
Hoeffer et al. [42], 2006	↓ hassles**	↑ ease**, ↑ gentleness**, ↑ verbal support**, and ↑ confidence*	--	--
3. Communication techniques				
Levy-Storms et al. [43], 2016	--	↑ all therapeutic communication behaviours**	--	--
Sprangers et al. [44], 2015	↓ distress*	↑ positive speech* and ↑ short instructions*	∅ change job satisfaction	--
Williams et al. [45], 2017	--	↓ elderspeak*	--	--
Williams et al. [47], 2021	--	↑ appropriate***, ↑ effective***, and ↑ person-centered communication*** ↑ recognition elderspeak***	--	↑ knowledge***
4. STAR				
Da Silva Serelli et al. [48], 2017	∅ change burden, depression, anxiety, or QoL	--	--	--
Goyder et al. [49], 2012	--	↑ hopeful attitudes* and ↑ building relationships***	--	--
5. Case conferences				
Halek et al. [50], 2020	*Neo*: ∅ change burnout or stress *IdA*: ↓ burnout*, ∅ change stress	*Neo*: ∅ change vocational action competence *IdA*: ∅ change vocational action competence	-- --	-- --
Lichtwarck et al. [53], 2019	--	↑ perceived competence** ∅ between-group difference attitudes, perception of mastery, or social interaction	--	--
6. Concept mapping				
Aberdeen and Byrne [54], 2018	--	↑ quality of care plans**	--	↑ knowledge***
Surr et al. [55], 2020 Surr et al. [56], 2020	--	↑ positive interactions at 6 months[e], no longer sig. at 16 months	--	--

Table 4 (continued)

Author, year	Psychological well-being[a]	Skills, behaviours, and competence[b]	Job satisfaction[c]	Knowledge[d]
Van de Ven et al. [57], 2013	↓ stress** ↓ negative and ↑ positive emotional reactions*	--	∅ change job satisfaction	--
6.1 Concept mapping compared to PCC				
Jeon et al. [59], 2012	*DCM*: ↓ EE** ∅ sig. between-group difference PA, DP, or distress	--	--	--
	PCC: ∅ change EE or sig. between-group difference for PA, DP, or distress		--	--
Stein-Parbury et al. [60], 2012	--	--	--	*PCC*: recognition and understanding of dementia resident behaviours as a form of communication. Ability to engage dementia residents in social interaction[Q]
7. Emotion-oriented approaches				
Chrzescijanski et al. [62], 2007	--	∅ change staff attitudes	--	--
Magai et al. [63], 2002	↑ well-being*	--	--	--
8. Medication review or antipsychotic use education				
Ballard et al. [65], 2018	--	↑ positive care interactions*	--	--
Maidment et al. [66] 2018	--	More holistic approach, less reliant on medication[Q]	--	--
9. MARQUE				
Livingston et al. [71], 2019	∅ change burnout	∅ change subjective competence or reporting of abusive behaviours	--	--
Laybourne et al. [72], 2021	--	Improved communication, understanding of role, and ability to try new things[Q]	--	--
Sampson et al. [73], 2021	--	↑ subjective competence[e] ∅ change quality of interactions	--	--
11. Other types of trainings				
Cohen-Mansfield et al. [77], 1997	--	∅ change perception of work difficulty nor quality of care	∅ change staff satisfaction	↑ knowledge**
Elpers et al. [79], 2017	--	Improved attitudes towards dementia[e]	--	--
Fukuda et al. [80], 2018	↓ distress* ∅ change burnout	--	--	--
Leone et al. [81], 2013	--	Changes in perceived difficulty in managing different symptoms[e]	--	Knowledge improved slightly but remained low[e]

Table 4 (continued)

Author, year	Psychological well-being[a]	Skills, behaviours, and competence[b]	Job satisfaction[c]	Knowledge[d]
Visser et al. [82], 2008	∅ change burnout	↑ perceived skills**	--	↑ perceived knowledge**

DCM, dementia care mapping; DP, depersonalization; EE, emotional exhaustion; IdA, innovative dementia-oriented assessment system; Neo, narrative approach; PA, personal accomplishment; PCC, person-centred care; QoL, quality of life; Sig, statistically significant; STAR, Staff Training for Assisted Living Residences. *$p \leq 0.05$. **$p \leq 0.01$. ***$p \leq 0.001$. --,No results reported on this outcome. [Q]Qualitative finding. ↑: increase. ↓: decrease. ∅: no change. Results related to post-intervention and follow-up measures in the main intervention arm(s) were reported unless specified otherwise. [a]Psychological well-being refers to a variety of outcomes measuring well-being. In this category, we included staff stress, distress, strain, anxiety, depression, QoL, overall well-being, and burnout. [b]Skills, behaviours, and competence refer to a variety of outcomes related to staff skills and competence at work, as well as therapeutic behaviours and techniques. In this category, we included, gentleness, verbal support, confidence, ease, practice change, quality of interactions, competence, attitudes, abusive behaviours, as well as outcomes more specific to certain categories of interventions such as bath duration and modality, and appropriate and effective communication behaviours. [c]Job satisfaction refers to satisfaction at work. [d]Knowledge refers to knowledge related to dementia care, BPSD management, therapeutic communication, and bathing techniques. [e]No *p* value reported.

Panel 8) and staff outcomes (e.g., more holistic approach, less reliant on medication [66]; Table 4, Panel 8).

9. Managing Agitation and Raising QoL

This category is defined as an intensive, psychosocial multicomponent manual-based interactive training, including getting to know the person and building activities [71], and included three studies [71–73] (Table 2, Panel 9). These studies demonstrated varying results on resident and staff outcomes (e.g., no significant results [71], improved resident agitation, QoL, and staff subjective competence [73]; Table 3, Panel 9; Table 4, Panel 9).

10. Appropriate Use of Physical Restraints

This category refers to structured training programs on adequate restraint use (e.g., structural, interactional). This category included three studies [74–76] (Table 2, Panel 10) that showed varied results on residents (e.g., worsened neuropsychiatric symptoms [76] and agitation [74], improved agitation [75], decreased restraint use [74]; Table 3, Panel 10). These studies did not report on staff outcomes.

Other Types of Trainings

Seven studies included were classified as varied trainings, not fitting into the previously mentioned categories [77–83] (Table 2, Panel 11) and reported mixed findings on resident (Table 3, Panel 11) and staff outcomes (Table 4, Panel 11).

Key Message

Among the 10 categories of interventions, the three demonstrating the most promising results on both residents and staff were trainings on (1) structured protocols and models, (2) person-centred bathing, and (3) communication techniques.

In addition, certain methods and clinical practices were associated with favourable and unfavourable outcomes. Pertaining to the favourable aspects, most included studies were based on a strong theoretical base, the PCC model. The trainings accompanied by additional support tended to demonstrate more sustainability [37, 82]. Also, multidimensional structured interventions showed their importance considering that BPSDs are multicausal [37–39]. In contrast, low support from management and low staff motivation hindered training implementation [37]. Certain "on-the-job" trainings had lower participation levels due to timing limits and work pressure from direct caregiving priorities [48, 54, 79].

Methodological Quality Assessment

The included studies varied in overall methodological quality, with many suboptimal quality ratings. The 27 articles reporting results of randomized controlled trials had scores varying from three to 10 out of 13, with a median score of seven. The 12 articles reported results of quasi-experimental studies, including one mixed methods study scored from one to eight out of nine, with a median score of seven. In addition, the three articles reporting results of qualitative studies, including one mixed methods study, had scores of two, eight, and nine out of 10. Lastly, the one cohort study had a score of seven out of 11 (Table 2; online suppl. Table 2).

Discussion

This systematic review aimed to summarize evidence on the best clinical practices and theoretical bases of staff training interventions on BPSD management in NHs

and the effects of these interventions on resident and staff outcomes. We found that a variety of staff trainings have been developed since 1996, and an important contribution of this review was how we regrouped studies examining their efficacy by typology. Using this typology, we identified three types of training interventions that demonstrate the most promising results: (1) structured protocols and models, (2) person-centred bathing, and (3) communication techniques. In the following subsections, we will discuss the results of each of these interventions, along with implications and potential avenues for future research.

Structured Protocols and Models

Firstly, we found that trainings on structured protocols and models improved a variety of resident (e.g., reduced BPSDs [37–39]) and staff outcomes (e.g., improved perceived self-efficacy [37]). Moreover, we observed that structured protocols resulted in a greater reduction of BPSDs than training alone [37], and that they showed the most efficacy when accompanied by CS [37]. This suggests that when staff are provided with adequate structure and guidance, they manage BPSDs better, and when accompanied by CS, these changes are more sustainable.

Globally, these results are consistent with a recent systematic review conducted by Manietta et al. [87]. However, they contrast regarding the effectiveness of structured protocols. Manietta et al. [87] found that trainings on structured protocols were associated with reduced BPSDs, but not more than training alone. This contradictory result may likely be explained by our different inclusion criteria, Manietta et al. [87] included structured protocols, and we included both structured protocols and care models. Given the small number of studies included in this category, their suboptimal methodological quality, and their unclear implementation fidelity, there is a strong need for further high-quality research on this intervention and for studies comparing the effectiveness of trainings with versus without structured protocols. Another important consideration is accompanying the training by CS to aim the sustainability of this intervention and others. Further studies on this aspect would be interesting to inform clinical practice.

Person-Centred Bathing

In our review, person-centred bathing interventions showed positive findings on both residents (e.g., decreased agitation [41]) and staff (e.g., improved gentleness [42]). Considering that hygiene care is a basic human need and that it is often associated with the manifestation of BPSDs [41], the inclusion of this intervention in the clinical and research context is important. A review conducted by Konno et al. [88] corroborates our findings by reporting that bathing interventions allow staff to provide better bathing care and that applying PCC during bathing reduces agitation. All studies in this category were based on PCC, suggesting the importance of this model in guiding BPSD management during hygiene care. Considering that only three studies were included in this category, and that most were of suboptimal methodological quality, future research using higher quality methods is necessary.

Communication Techniques

We found that trainings on communication techniques are associated with positive outcomes on both residents (e.g., decreased resistiveness to care [45]) and staff (e.g., improved communication [43–45, 47] and knowledge [47]). Communication is an important part of staff-resident interactions and is essential in allowing a more adequate interpretation of resident needs and providing higher quality care [43]. Nguyen et al. [26] and McGilton et al. [27] also found that communication trainings positively impacted staff competence [26, 27], knowledge [26, 27], and communication [27], as well as decreased resident agitation and verbal resistance [27]. Therefore, we recommend the implementation of communication technique trainings in clinical practice and future studies.

Lastly, we noted many barriers and facilitators to the efficacy of these staff trainings. Trainings accompanied by additional support, containing a strong theoretical base and multidimensional approaches, had more positive effects. Low managerial support and "on-the-job" trainings were often related to lower levels of change to practice. A systematic review conducted by Spector et al. [89] corroborates these findings. Moreover, the suboptimal implementation of interventions also raises questions regarding fidelity procedures and the necessary knowledge, time, and resources required to implement multicomponent interventions [38].

Therefore, we recommend to authors of future studies on BPSD training interventions, to base their training on a strong theoretical base (e.g., PCC) and include multiple approaches as BPSDs are multicausal. We also recommend the implementation of these trainings in collaboration with NH management and its administration outside of work hours to avoid distractions associated with direct caregiving priorities.

In addition, although the relative international consensus on the scales to use when assessing resident outcomes (e.g., CMAI, NPI, CSDD), a variety of self and observer-rated

scales were used to assess staff outcomes, and many were not validated. An interesting avenue for future research pertains to the assessment of the adequacy, appropriateness, and validity of the scales measuring staff outcomes.

Strengths and Limitations

This systematic review has some important strengths. We built on and expanded the recent work by Manietta et al. [87] and Nguyen et al. [26], as well as earlier reviews by McGilton et al. [27], Konno et al. [88], and Spector et al. [89] in three important ways: (1) by summarizing evidence on a broad range of training interventions, (2) by organizing existing studies into a typology of training interventions, and (3) by summarizing the effect of these interventions on a variety of resident and staff outcomes. Despite these strengths, our review has some limitations. Firstly, although a comprehensive search strategy was used, there is a possibility, as with any systematic review, that some important studies were omitted. Therefore, we encourage the research community to periodically update and expand our work. Secondly, limitations of the original studies, including the suboptimal methodological robustness, may have influenced our conclusions. Thirdly, the reproducibility of many interventions is questionable due to a variability in their description and application, and the low availability of supplementary information and training manuals. Their real-world feasibility is also put into question, as many interventions require specialized services, to which access is restricted and costly. These limits to reproducibility and feasibility were also observed in a systematic review conducted by Reis et al. [90] which corroborates our findings. Consequently, future studies should use transparent and detailed methods, provide supplementary material to facilitate reproducibility of interventions deemed effective, and use staff that is accessible daily in NHs for feasibility and cost-effectiveness reasons.

Conclusion

This systematic review demonstrates a need for staff training interventions on BPSD management that incorporate structured protocols and models, person-centred bathing, and communication techniques and the evaluation of their efficacy on both resident and staff outcomes. It also emphasizes the importance of using a strong theoretical base (e.g., PCC), multidimensional approaches, offering CS, and managerial support of the intervention. Higher quality studies using transparent methods, a comprehensive approach to reporting findings, and utilizing staff that is accessible daily on NH units are also important elements to consider.

Statement of Ethics

An ethics statement is not applicable because this study is based exclusively on published literature.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All listed authors (DC, ÉT, and CMR) have made substantial contributions to the conception or design of the work, the acquisition, analysis, or interpretation of data for the work, and drafting the work or revising it critically for important intellectual content; have given final approval of the version to be published; and have agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Data Availability Statement

All data generated or analysed during this review are included in the article and its online supplementary material files. Further enquiries can be directed to the corresponding author.

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