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Impact of canine-assisted interventions on the health and well-being of older people residing in long-term care: a mixed methods systematic review protocol

Stern, Cindy, Lizarondo, Lucyllynn, Carrier, Judith, Godfrey, Christina, Rieger, Kendra, Salmond, Susan, Apostolo, Joao, Kirkpatrick, Pamela and Loveday, Heather ORCID logo

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1 **The experiences and effectiveness of canine-assisted interventions (CAIs) on the health and well-being of**
 2 **older people residing in long-term care: A mixed methods systematic review protocol**
 3

4 **Abstract**
 5

6 **Objective:** To synthesize and integrate the best available evidence on the experiences and
 7 effectiveness of canine-assisted interventions (CAIs) on the health and well-being of older people
 8 residing in long-term care.

9 **Introduction:** Canine-assisted interventions (CAIs) are commonly used as an adjunct therapy to
 10 enhance health and well-being and are often implemented in long-term care facilities. The number of
 11 studies undertaken in this area has increased substantially over the last five years; therefore, an
 12 update of two previous systematic reviews is warranted.

13 **Inclusion criteria:** This review will consider older people who reside in long-term care facilities and
 14 who receive CAIs. For the quantitative component, CAIs will be compared to usual care, alternative
 15 therapeutic interventions or no interventions and outcomes will be grouped under the following
 16 headings: biological, psychological and social. For the qualitative component, the experiences of older
 17 people receiving CAIs as well as the views of people directly or indirectly involved in delivering CAIs
 18 will be explored. Quantitative, qualitative and mixed methods studies published from 2009 to the
 19 present will be considered.

20 **Methods:** A search of 10 bibliographic databases and other various resources for published and
 21 unpublished English language studies will be undertaken. Study selection, critical appraisal, data
 22 extraction and data synthesis will be undertaken following the segregated JBI approach to mixed
 23 methods reviews.

24 **Systematic review registration number:** PROSPERO XXXXX.

25 **Review questions**

26 The aim of this mixed methods review is to synthesize and integrate the best available evidence on
 27 the experiences and effectiveness of canine-assisted interventions (CAIs) on the health and well-
 28 being of older people residing in long-term care. More specifically the review questions are:

- 29 • What are the experiences of older people residing in long-term care who receive CAIs?
- 30 • What are the views of people directly or indirectly involved in delivering CAIs to older
 31 adults (such as family and friends of the residents, healthcare workers and volunteers)
 32 regarding CAIs for older people residing in long-term care facilities?
- 33 • What is the effectiveness of CAIs on the health and well-being of older people residing in
 34 long-term care facilities?

35 **Introduction**

36 The term 'human-animal bond' refers to the connection people and animals experience, considered to
 37 be mutually beneficial and enhancing health and well-being.¹ This two-way relationship (which some

38 consider links to Bowlby's attachment theory)^{2,3} has led to the introduction of animals being used in
39 therapeutic roles such as animal-assisted interventions (AAI, the focus of this review) and service
40 animals.⁴ Animal-assisted interventions refers to the "utilization of various species of animals in
41 diverse manners beneficial to humans"^{5para4} and are often further grouped into animal-assisted
42 therapies (AAT), animal-assisted activities (AAA) and animal-assisted education (AAE) (See Table 1
43 for explanation of terms).

44 <Table 1. Types of animal-assisted interventions⁵>

45 Commonly used as an adjunct to both pharmacological and non-pharmacological therapies, AAls can
46 be delivered one-on-one or in group formats with a range of animals being used. Shen and
47 colleagues suggest AAls are highly accepted interventions across different populations, conditions
48 and settings⁶ with the most common species utilized being canines⁶⁻⁸ The holistic nature of AAls
49 suggests potential benefits may extend across the physical, emotional and social spectrum however
50 results are varied.^{6,7,9-18} Nimer and Lundahl showed AAls produced moderate effect sizes to improve
51 emotional well-being, behavioural problems, medical difficulties as well as autism spectrum
52 symptoms.⁸ In this meta-analysis, dogs were consistently associated with moderate effect sizes
53 which did not occur in the other animals examined.⁸ Reviews in this area generally indicate some
54 small benefit in outcomes but go on to acknowledge that the lack of methodological rigour in studies
55 impacts on the results of research. Despite these limitations, popularity of AAls continues to increase
56 with the number of published studies rising. A search of "animal-assisted therapy" in PubMed
57 produced close to 450 results with over 50% of papers being published over the last five years
58 (search undertaken 9th May 2019).

59 One population and setting where AAls are used is with older people in long-term care facilities. With
60 an increasingly ageing population^{19,20} there is a demand for high quality long-term care. Additionally
61 once a person enters a care facility, increases in physical and psychosocial morbidities can occur.²¹
62 Animal-assisted interventions may be able to play a role in improving health and well-being of
63 residents for example by reducing depression and improving quality of life.⁷ This type of intervention
64 seems particularly relevant to older people living in long-term care facilities as human animal-
65 interactions are not dependent on a high level of cognitive function²² nor high physical and functioning
66 ability.²³ Further Maclean suggests that people with mental health issues that may be reluctant to use
67 conventional treatment may prefer alternative treatments such as AAls.²⁴

68 Two systematic reviews undertaken in 2011^{23,25} focused exclusively on canine-assisted interventions
69 (CAIs) for this population. The first looked at the effects of CAIs while the other explored the
70 experiences of residents involved in CAIs. Heterogeneity across interventions and outcomes
71 prohibited pooling of studies in the quantitative review however, results from individual studies
72 indicated some physical and emotional short-term benefits. The review went on to acknowledge that
73 CAIs were no more effective than other interventions that were provided such as visits from people.²³
74 The qualitative synthesis included only two studies with meta-aggregation producing two synthesized

75 findings. The first indicated that residents involved in CAI's may experience a range of mental,
 76 emotional, physiological and social benefits while the second finding related to the practical and
 77 safety concerns associated with CAI's.²⁵ With popularity of CAI's increasing (as demonstrated by the
 78 rise in primary research recently undertaken), the ageing population and the potential of these
 79 interventions to improve the health and well-being of residents in long-term care facilities, it is
 80 considered appropriate to strengthen the evidence by updating the original reviews. This aligns to the
 81 decision framework developed by Garner et al to assess systematic reviews for updating.²⁶ The
 82 importance of keeping reviews as current as possible has been recognized^{26,27} with Garner and
 83 colleagues highlighting that by not updating reviews, authors are compromising a review's integrity,
 84 potentially misleading readers about the current state of the science.²⁶

85 New guidance for the conduct of mixed methods reviews²⁸ provides the opportunity to combine the
 86 two reviews into one thereby allowing the integration of qualitative and quantitative evidence. Mixed
 87 methods reviews bring together the findings of effectiveness (quantitative evidence) and patient,
 88 family, staff or other's experiences (qualitative evidence) to enhance their usefulness to clinicians and
 89 clinical, policy or organizational decision-makers.²⁸ They broaden the focus of a systematic review
 90 allowing for a more in-depth exploration of healthcare phenomena thereby maximizing the findings
 91 that one method alone could not achieve.²⁹

92 A preliminary search of PubMed, CINAHL, PROSPERO, *The JBI Database of Systematic Reviews*
 93 *and Implementation Reports* and The Cochrane Database of Systematic Reviews indicated a number
 94 of single method reviews have been conducted since the original reviews were published however
 95 most have not focused specifically on this population (older people), the setting (long-term care) and
 96 the intervention (canines).^{6,7,9,10,12-15,17,18} Cipriani et al (2013) did examine the effect of canine-assisted
 97 therapies (CAT) on older adults residing in long-term care however the search was undertaken up
 98 until 2010.¹¹ Out of the 19 studies included in the review, twelve demonstrated statistically significant
 99 improvement in outcomes for residents. No mixed methods reviews were located in the search. A
 100 PROSPERO record registered in 2017³⁰ indicates a systematic review containing both qualitative and
 101 quantitative evidence is in progress which focuses on older people in long-term care however the
 102 review is not restricted to canines and the approach to bringing the results together is not clearly
 103 detailed. The authors have been contacted for additional information regarding the approach being
 104 taken to integration and when the review is anticipated to be completed (since the expected date
 105 provided has passed); however, no further details were provided. Therefore the overall aim of this
 106 review is to update and combine two previous systematic reviews to explore the experiences and
 107 effectiveness of CAIs on the health and social care of older people who reside in long-term care.

108 **Keywords**

109 animal-assisted; canine, dog; pet therapy; mixed methods; qualitative; quantitative

110 **Inclusion Criteria**

111 **Participants**

112 The review will consider studies that include older people (60 years and older) who reside in long-
 113 term care facilities and who receive CAIs. **Studies that contain people younger than 60 will be**
 114 **included as long as the mean age is 60.** There will be no exclusions based on medical conditions or
 115 co-morbidities.

116

117 Additionally for the qualitative component, the views of people directly or indirectly involved in
 118 delivering CAIs to older adults such as family and friends of the residents, healthcare workers and
 119 volunteers will also be considered

120 **Intervention**

121 The quantitative component of the review will consider studies that evaluate CAIs. Interventions will
 122 be grouped as either canine-assisted activities (CAAs) or canine-assisted therapies (CATs). For the
 123 purpose of this review definitions will be based on those provided by the American Veterinary Medical
 124 Associations.⁵ Canine-assisted activities “provide opportunities for motivational, educational, and/or
 125 recreational benefits to enhance quality of life.”^{5para7} Canine-assisted therapies are “a goal directed
 126 intervention directed and/or delivered by a health/human service professional with specialised
 127 expertise, and within the scope of practice of his/her profession.”^{5para5} Canine-assisted education will
 128 not be considered since this intervention is rarely measured in studies in this area. There will be no
 129 limitations to the duration of interventions or the required follow-up.

130 **Comparator**

131 The quantitative component of the review will consider studies that compare the intervention to usual
 132 care, alternative therapeutic interventions or no intervention.

133 **Outcomes**

134 The quantitative component of this review will consider studies that include **outcomes related to health**
 135 **and well-being including but not limited to: loneliness, depression, anxiety, well-being, quality of life,**
 136 **mood, satisfaction, morale, self-esteem, activity participation/involvement, activities of daily living,**
 137 **blood pressure, and social interaction. Where possible review outcomes will be grouped under the**
 138 **biopsychosocial model³¹ e.g.:**

- 139• **Biological (e.g. blood pressure)**
- 140• **Psychological (e.g. depression)**
- 141• **Social (e.g. social interaction)**

142 Outcomes can be measured using any validated instrument, via observation or by self-report, and
 143 measured during or immediately after the intervention or at a follow-up period.

144 **Phenomena of interest**

145 The qualitative component of this review will consider studies that investigate the experiences of older
 146 people receiving the CAIs as well as the views of people directly or indirectly involved in delivering
 147 CAIs to them such as family and friends of the residents, healthcare workers and volunteers.

148 **Context**

149 The review will consider studies undertaken in long-term care facilities **which will include any setting**
 150 **for older people who are unable to manage independently in the community including nursing homes,**
 151 **skilled aged care facilities, assisted living facilities and hostels for the aged.** There will be no limits
 152 regarding cultural factors or geographical location.

153 **Types of studies**

154 This review will consider quantitative, qualitative and mixed methods studies. Quantitative studies will
 155 include experimental and quasi-experimental study designs, analytical observational studies,
 156 analytical cross-sectional studies and descriptive observational study designs. Randomized controlled
 157 trials (RCTs) will be considered as the primary focus however in their absence other research designs
 158 will be considered. Qualitative studies will include designs such as phenomenology, grounded theory,
 159 ethnography, qualitative description, action research and feminist research. Mixed method studies will
 160 be considered if data from the quantitative or qualitative components can be clearly extracted. Where
 161 data is not reported, authors will be contacted.

162 Studies published in English will be included. Studies published from April 2009 to the present will be
 163 included as this is an update of two previous systematic reviews.^{23,25}

164 **Methods**

165 The proposed systematic review will be conducted in accordance with the Joanna Briggs Institute
 166 (JBI) methodology for Mixed Methods Systematic Review (MMSR).²⁸ This review title has been
 167 registered in PROSPERO, registration number XXX.

168 **Search strategy**

169 The search strategy will aim to find both published and unpublished studies. An initial limited search
 170 of MEDLINE and CINAHL was undertaken to identify articles on the topic. The text words contained in
 171 the titles and abstracts of relevant articles, and the index terms used to describe the articles were
 172 used to develop a full search strategy for CINAHL (see Appendix I). The search strategy, including all

173 identified keywords and index terms will be adapted for each included information source. The
 174 reference list of all studies selected for critical appraisal will be screened for additional studies.

175 **Information Sources**

176 The databases to be searched include: PubMed, CINAHL (EBSCO Host), EMBASE (Elsevier),
 177 PsycINFO (Ovid), PsycARTICLES (Ovid), AUSThealth (Informit), Scopus (Elsevier), Web of Science
 178 (Web of Science Core Collection; CABI; Current Contents Connect), OT seeker and PEDro.

179 The trial registers to be searched include: Cochrane Central Register of Controlled Trials,
 180 Clinicaltrials.gov (For quantitative studies only)

181 The search for unpublished studies and gray literature will include: Trove, The Networked Digital
 182 Library of Theses and Dissertations (NDLTD), Proquest Dissertations and Theses (Global), Delta
 183 Society Australia website (<https://www.deltasociety.com.au>), Pet Partners website
 184 (<https://petpartners.org/>) (previously known as the Delta Society)

185 **Study selection**

186 Following the search, all identified citations will be loaded into EndNote version 8 (Clarivate Analytics,
 187 PA, USA) and duplicates removed. Titles and abstracts will then be screened by two independent
 188 reviewers for assessment against the inclusion criteria for the review. Potentially relevant studies will
 189 be retrieved in full and their citation details imported into the Joanna Briggs Institute's System for the
 190 Unified Management, Assessment and Review of Information (JBI SUMARI; Joanna Briggs Institute,
 191 Adelaide, Australia). The full text of selected citations will be assessed in detail against the inclusion
 192 criteria by two independent reviewers. Reasons for exclusion of full text studies that do not meet the
 193 inclusion criteria will be recorded and reported in the systematic review. Any disagreements that arise
 194 between the reviewers at each stage of the study selection process will be resolved through
 195 discussion, or with a third reviewer. The results of the search will be reported in full in the final review
 196 and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA)
 197 flow diagram.³²

198 **Assessment of methodological quality**

199 Quantitative papers (and quantitative component of mixed methods papers) selected for retrieval will
 200 be assessed by two independent reviewers for methodological validity prior to inclusion in the review
 201 using standardized critical appraisal instruments from JBI SUMARI based on study design e.g. RCT,
 202 quasi-experimental studies etc.³³

203 Qualitative papers (and qualitative component of mixed methods papers) selected for retrieval will be
 204 assessed by two independent reviewers for methodological validity prior to inclusion in the review
 205 using the standard JBI critical appraisal checklist for Qualitative Research available in JBI SUMARI.³⁴

206 Authors of papers will be contacted to request missing or additional data for clarification, where
 207 required. Any disagreements that arise between the reviewers will be resolved through discussion, or
 208 with a third reviewer. The results of critical appraisal will be reported in narrative form and in a table.

209 All studies, regardless of the results of their methodological quality, will undergo data extraction and
 210 synthesis (where possible) and the impact of methodological quality will be considered when
 211 developing conclusions and recommendations for practice.

212 **Data extraction**

213 For the quantitative component, data will be extracted from quantitative and mixed methods
 214 (quantitative component only) studies included in the review by two independent reviewers using the
 215 standardized Joanna Briggs Institute data extraction tool in JBI SUMARI.³³ The data extracted will
 216 include specific details about the populations, study methods, interventions, and outcomes of
 217 significance to the review objective.

218 For the qualitative component, data will be extracted from qualitative and mixed methods (qualitative
 219 component only) studies included in the review by two independent reviewers using the standardized
 220 Joanna Briggs Institute data extraction tool in JBI SUMARI³⁴ The data extracted will include specific
 221 details about the population, context, culture, geographical location, study methods and the
 222 phenomena of interest relevant to the review objective. Findings, and their illustrations will be
 223 extracted and assigned a level of credibility using the JBI ranking scale available through JBI
 224 SUMARI.

225 Any disagreements that arise between the reviewers will be resolved through discussion, or with a
 226 third reviewer. Authors of papers will be contacted to request missing or additional data, where
 227 required.

228 **Data synthesis**

229 This review will follow a convergent segregated approach to synthesis and integration according to
 230 the JBI methodology for MMSR using JBI SUMARI.²⁸ This will involve separate quantitative and
 231 qualitative synthesis followed by integration of the resultant quantitative evidence and qualitative
 232 evidence.

233 **Quantitative synthesis**

234 Studies will, where possible, be pooled with statistical meta-analysis using JBI SUMARI. Effect sizes
 235 will be expressed as either odds ratios (for dichotomous data) or weighted (or standardized) final
 236 post-intervention mean differences (for continuous data) and their 95% confidence intervals will be
 237 calculated for analysis. Heterogeneity will be assessed statistically using the standard chi squared
 238 and I² tests. The choice of model (random or fixed effects) and method for meta-analysis will be

239 based on the guidance by Tufunaru et al.³³ Subgroup analyses will be conducted where there is
 240 sufficient data to investigate CATs and CAAs and morbidities. Sensitivity analyses will be conducted
 241 to test decisions made regarding methodological quality. Where statistical pooling is not possible the
 242 findings will be presented in narrative form including tables and figures to aid in data presentation,
 243 where appropriate. A funnel plot will be generated to assess publication bias if there are 10 or more
 244 studies included in a meta-analysis. Statistical tests for funnel plot asymmetry (Egger test, Begg test,
 245 Harbord test) will be performed where appropriate.

246 Qualitative synthesis

247 Qualitative research findings will, where possible be pooled using JBI SUMARI with the meta-
 248 aggregation approach.³⁴ This will involve the aggregation or synthesis of findings to generate a set of
 249 statements that represent that aggregation, through assembling the findings and categorizing these
 250 findings based on similarity in meaning. These categories are then subjected to a synthesis to
 251 produce a comprehensive set of synthesized findings that can be used as a basis for evidence-based
 252 practice. Where textual pooling is not possible the findings will be presented in narrative form.

253 Integration of quantitative evidence and qualitative evidence

254 The findings of each single method synthesis included in this review will then be configured according
 255 to the JBI methodology for mixed methods systematic reviews.²⁸ This will involve quantitative
 256 evidence and qualitative evidence being juxtaposed together and organized/linked into a line of
 257 argument to produce an overall configured analysis. Where configuration is not possible the findings
 258 will be presented in narrative form

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349

350 **Appendix I - Search Strategy**

351 CINAHL - search conducted 16th May 2019

352 S1 ((MH "Aged") OR (MH "Frail Elderly") OR (MH "Aged, 80 and Over")) OR TI ("aged" OR "elderly"
 353 OR "senior" OR "older people" OR "geriatric" OR "older person") OR AB ("aged" OR "elderly" OR
 354 "senior" OR "older people" OR "geriatric" OR "older person") OR ((MH "Nursing Home Patients") OR
 355 (MH "Residential Facilities") OR (MH "Long Term Care") OR (MH "Residential Care") OR (MH
 356 "Nursing Homes") OR (MH "Housing for the Elderly") OR (MH "Gerontologic Care")) OR TI ("nursing
 357 home resident" OR "residential facilit*" OR "long term care" OR "residential care" OR "nursing home"
 358 OR "aged care") OR AB ("nursing home resident" OR "residential facilit*" OR "long term care" OR
 359 "residential care" OR "nursing home" OR "aged care") **(879,304)**

360 S2((MH "Animal Assisted Therapy (Iowa NIC)") OR (MH "Pet Therapy") OR (MH "Dogs")) OR TI ("
 361 animal-assisted" OR "pet therapy" OR "animal facilitated therapy" OR "pet facilitated therapy" OR
 362 "dogs") OR AB ("animal-assisted" OR "pet therapy" OR "animal facilitated therapy" OR "pet
 363 facilitated therapy" OR "dogs") **(10,518)**

364 S3 S1 AND S2 **(851)**

365 S4 S1 AND S2 Limiters - Published Date: 20090401-20190531; English Language **(480)**

366