

1 **Abstract**

2

3 *Background:* Many interventions have been developed to promote respect and social inclusion
4 among older people, but the evidence on their impacts on health has not been synthesised. This
5 systematic review aims to appraise the state of the evidence across the quantitative and
6 qualitative literature.

7 *Methods:* Eligible studies published between 1990 and 2015 were identified by scanning seven
8 bibliographic databases using a pre-piloted strategy, searching grey literature, and contacting
9 experts. Studies were included if they assessed the impact (quantitatively) and/or perceived
10 impact (qualitatively) of an intervention promoting respect and social inclusion on the physical
11 or mental health of community-residing people aged 60 years and older. Titles and abstracts
12 were screened for eligibility by one reviewer. A second reviewer independently screened a ten
13 percent random sample. Full texts were screened for eligibility by one reviewer, with
14 verification by another reviewer. Risk of bias was assessed using standardised tools. Findings
15 were summarised using narrative synthesis, Harvest Plots, and logic models to depict the
16 potential pathways to health outcomes.

17 *Results:* Of the 27,354 records retrieved, 40 studies (23 quantitative, 6 qualitative, 11 mixed
18 methods) were included. All studies were conducted in high and upper middle-income
19 countries. Interventions involved: mentoring; intergenerational and multi-activity programmes;
20 dancing; music and singing; art and culture; and information communication technology. Most
21 studies (n=24) were at high or moderate risk of bias. Music and singing, intergenerational
22 interventions, art and culture, and multi-activity interventions were associated with an overall
23 positive impact on health outcomes. This included: depression (n=3); wellbeing (n=3);
24 subjective health (n=2); quality of life (n=2); perceived stress and mental health (n=2); and
25 physical health (n=2). Qualitative studies offered explanations for mediating factors (e.g.

26 improved self-esteem) that may lead to improved health outcomes and contributed to the
27 assessment of causation.

28 *Conclusions:* Whilst this review suggests that some interventions may positively impact on the
29 health outcomes of older people, and identified mediating factors to health outcomes, the
30 evidence is based on studies with heterogeneous methodologies. Many of the interventions
31 were delivered as projects to selected groups, raising important questions about the feasibility
32 of wider implementation and the potential for population-wide benefits.

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34 **Keywords**

35 Social inclusion; older people; ageing; systematic review; health impact; age-friendly
36 environments

37 **Background**

38 According to the World Population Ageing report [1] the world's population aged 60 years
39 and older is expected to increase to more than two billion by 2050; by 2030, one in six people
40 will be 60 years or older. A growing number of these older people live in urban environments,
41 with particularly rapid increases in low- and middle-income countries [2]. The combination of
42 population ageing and urbanisation places increasingly complex demands on health and social
43 care systems, raising significant challenges for welfare systems worldwide [3,4].

44 The older population should be a net asset to society, but suitable policies and services in place
45 will be required to realise this [4–6]. In the ‘Global Strategy and Action Plan on Ageing and
46 Health’, published in 2016, the WHO advocated the development of physical and social
47 settings that support older people to live independently and in good health for longer, but also
48 optimise health and wellbeing for the wider community [7]. ‘Age friendly environments’ aim

49 to facilitate older adults' access to opportunities for social interaction and engagement with
50 cultural and social resources (*e.g.* libraries and green spaces) [8,9].

51 A range of interventions have been developed to create age-friendly environments, based on
52 eight different domains theorised by the WHO as having a potential impact on health and
53 wellbeing [10]. One of these domains is respect and social inclusion, which has been
54 considered of fundamental importance to older people in qualitative research [10–14] and in
55 national and international policy [4,6,7,15,16]. Persistent disrespectful attitudes and
56 misconceptions about older people and growing old are acknowledged as being a significant
57 barrier to the development of good public health policies on ageing [7,17]. They lead to
58 negative perceptions of ageing (*e.g.* by disregarding the contribution older people make to
59 society) and can negatively impact health and wellbeing in later life [18–20]. For instance,
60 Levy *et al.* [21] have shown that older people who were exposed to negative age-stereotypes
61 were less likely to recuperate from disability than those exposed to more positive self-
62 perceptions of ageing. Moreover, people who internalised negative age stereotypes sooner in
63 life were more likely to experience cardiovascular events in the coming 38 years than those
64 who had more positive self-perceptions of ageing [22].

65 The term social inclusion has explicit links with concepts such as equality, human rights, social
66 cohesion, and it has focused on barriers that prevent people from participating meaningfully in
67 society [19]. By focusing on goals rather than problems, the concept of inclusion adopts a
68 positive approach [24,25]. It is not merely the implied opposite of social exclusion, but refers
69 to the opportunities for individuals to cultivate social relationships, have access to resources
70 and feel part of the community they live in [23,26,27]. Respect in relation to older people,
71 meanwhile, refers to positive attitudes and behaviours towards the elderly, so that they may
72 feel accepted, valued, and appreciated by the community regardless of age [28].

73 While many interventions to promote respect and social inclusion in older people have been
74 developed, the evidence on their impacts on health and wellbeing has not been synthesised.
75 One of the reasons for this limited synthesis owes to complexity of these interventions [29]. In
76 this context, complexity may arise by the various interactions between the components that
77 may be involved in the intervention and its context, and external factors. For instance, an
78 intervention may indirectly improve the level of social engagement of older adults, and in turn
79 their wellbeing and quality of life [2]. The same intervention may also consist of relatively
80 well-defined initiatives (*e.g.* reading activities), or may be a much more complex set of actions
81 driven by policy (*e.g.* different reading activities in various schools). These are some of the
82 reasons that make the assessment and synthesis of these interventions particularly challenging
83 [30–39]. The WHO has identified synthesising the evidence on interventions promoting age-
84 friendly environments as a key priority, to establish what is known about the impacts of these
85 [7]. Responding to this call, this systematic review attempts to synthesise the evidence of health
86 impacts of interventions on respect and social inclusion in older people. It addresses the
87 following research question: What is the empirical evidence on the impact on health and
88 wellbeing of interventions which foster respect and social inclusion in community-residing
89 older adults? The aims were to (i) identify and understand the health impacts of interventions
90 that aim to promote respect and social inclusion among older people; and (ii) to elucidate the
91 complex pathways that may lead to improved health outcomes.

92 **Methods**

93
94 We followed the Centre for Reviews and Dissemination’s guidance for undertaking reviews in
95 healthcare [40]. The Preferred Reporting Items for Systematic reviews and Meta-Analyses
96 (PRISMA) guidelines informed our reporting [41]. The protocol was registered with the
97 PROSPERO database [42], and a PRISMA checklist is available as Additional file 1.

98 The first step we took, before searching the literature, was to develop logic models depicting
99 the possible multiple interacting pathways through which the interventions could affect health
100 and wellbeing [35,43–45], as recommended in the literature on evidence synthesis of complex
101 interventions [36,43,46–50]. First, we conducted scoping work (which involved looking at
102 existing literature reviews [51,52], and key background literature [10,14,53,54] on respect and
103 social inclusion and age-friendly environments), to identify interventions, outcomes, and
104 mediating factors that were mentioned in relation to promoting respect and social inclusion in
105 older people.

106 Two main types of interventions emerged: 1) intergenerational interventions, and 2)
107 information and communication technology interventions. For these two intervention types, we
108 developed logic models at the start of the review process, based on the pathways mentioned in
109 the literature; we then went on to adapt them over the course of the review process, to
110 incorporate the additional information we identified. Please refer to Figure 3 and Figure 4, in
111 the Results, for an example of the logic models for intergenerational interventions.

112 For interventions which were not identified from our scoping review, but which met our
113 inclusion criteria (*e.g.* they qualified as interventions promoting respect and social inclusion,
114 such as music and singing activities), we generated logic models after studies were assessed
115 for inclusion. These models were based on the information reported in the included studies
116 about mediating factors and pathways. For further details on the synthesis process, please refer
117 to the Synthesis section.

118 **Search strategy**

119 We developed and piloted a search strategy designed to capture the most relevant evidence to
120 address the research question. We searched eight electronic bibliographic databases: Scopus,
121 MEDLINE, PSYCINFO, CINAHL, and Web of Science Core Collection: Citation Indexes
122

123 (Social Science Citation Index, Science Citation Index, Book Citation Index–Science, Book
124 Citation Index - Social Sciences & Humanities); the Web of Science Core Collection: Citation
125 Indexes (Conference Proceedings Citation Index- Science, Conference Proceedings Citation
126 Index - Social Science & Humanities); The Cochrane Library: Cochrane Reviews (Reviews
127 and Protocols) and Other Reviews and Trials; ProQuest Dissertations & Thesis. Searches
128 comprised a combination of subject terms selected from the controlled vocabulary or thesaurus
129 where possible (MEDLINE, CINAHL, and PSYCINFO) and a wide range of free-text terms.
130 For the full electronic strategy used to search MEDLINE, see Additional file 2. Relevant
131 systematic reviews were retrieved, and titles of individual studies were checked to see if they
132 met the inclusion criteria.

133 We searched sources of grey literature including policy papers and reports from: The Joseph
134 Rowntree Foundation (<http://www.jrf.org.uk/>); Age UK (<http://www.ageuk.org.uk/>); Age of
135 Creativity (<http://www.ageofcreativity.co.uk/>); Alzheimer’s association
136 (<http://www.alzheimers.org.uk/>); Intergen (<http://www.intergen.org.uk/>); Beth Johnson
137 Foundation (<http://www.bjf.org.uk/>); Manchester Institute for Collaborative Research on
138 Ageing (<http://www.micra.manchester.ac.uk/>). We checked the list of references of potentially
139 relevant papers included as full text if the title met the inclusion criteria. We also contacted
140 topic experts to identify any additional data sources.

141 Searches were restricted to the English language as there were no resources for translation. We
142 were interested in literature relevant to contemporary social and political contexts of ageing
143 and respect and social inclusion. The aim of our review was to identify evidence about
144 interventions which could be implemented in the context of current efforts to promote age-
145 friendly environments. We therefore chose the 1990 as the start date of our searches (up until
146 January 2015, when the search was conducted), to coincide with the emergence of debates

147 about, and initiatives aimed at, designing optimum community environments for ageing
148 populations [55].

149 **Inclusion criteria**

150

151 1. **Population:** Studies where at least 50% of participants were aged 60+ years were eligible
152 for the review. Those where some of the population were younger than 60 years were
153 included if the data for subgroups of older people (60+ years) could be disaggregated or
154 where the average age was over 60.

155 2. **Interventions:** Any intervention aiming to improve respect and social inclusion in older
156 people was included. Studies were included if they did not explicitly mention either term
157 but where the purpose of the intervention was to improve community inclusion, social
158 participation, sense of belonging, access to learning, cultural, and social opportunities, or
159 social relationships in the community. We only included mentoring interventions where the
160 aim was to engage older people in social activities with others within a group setting. By
161 contrast, befriending interventions focus on improving the level of social support and
162 decreasing loneliness through one-to-one interaction [56]. Because the latter is not a group
163 or community-based activity, it did not meet our inclusion criteria.

164 3. **Control groups:** Relevant comparison groups included (i) older people not exposed to the
165 intervention being investigated, (ii) older people exposed to other forms of interventions
166 included as 'usual practice' and (iii) older people exposed to other interventions for respect
167 and social inclusion. This criterion applied only to quantitative studies.

168 4. **Outcomes assessed quantitatively:** Health outcomes pertinent to the review included any
169 measure of physical and mental health of participants, health-related quality of life, and
170 measures of wellbeing. Standardised outcome measures were defined as those supported
171 by an academic reference and evidence of their psychometric properties. Non-standardised
172 health outcome measures were defined as those developed by the authors for the purposes

173 of the study. Although we recognised that cognitive function is a health outcome, through
174 our logic models, outcomes related to cognitive function (*e.g.* memory and language
175 attention) were included only if there was evidence that the intervention (*e.g.* Internet
176 training) increased respect and social inclusion and that this led to the improved outcome.
177 Likewise, outcomes related to autonomy and physical activity (*e.g.* posture, balance,
178 muscle strength, stability, and walking speed) were included only if there was evidence that
179 the intervention (*e.g.* dancing classes) increased respect and social inclusion and that this
180 led to the improved outcome.

181 5. **Setting:** Only studies conducted in community settings were included in the review.
182 Studies that included groups from both community and institutionalised settings (*e.g.*
183 nursing homes) were included if the community data could be disaggregated.

184 6. **Study design:** All empirical study designs including quantitative designs (randomised and
185 non-randomised controlled studies, before and after studies), mixed methods design and
186 qualitative designs were eligible for the review. Case studies (defined as “drawing on
187 multiple sources of information to provide a broad evaluation of a specific project, program,
188 or policy” [52 p.122]) were only included if sampling techniques, data collection methods
189 and results/analysis of health impacts could be ascertained.

190 **Screening and selection**

191
192 Search results were downloaded into EPPI-Reviewer 4 software [58]. After removing
193 duplicates, titles and abstracts were screened for eligibility by one reviewer (SR), using a pre-
194 designed and piloted tool based on the inclusion criteria. A second reviewer (NKV)
195 independently screened a 10% random sample of titles and abstracts. The level of agreement
196 was checked using EPPI-REVIEWER 4 software. This produced a reconciliation report
197 showing that there was less than 2% disagreement out of 2736 papers independently coded by
198 the two reviewers (SR & NKV). Disagreements were resolved through discussion or by

199 recourse to a third reviewer (LO/DP/NB). One reviewer (SR) screened full text papers for
200 eligibility with 15% were screened by another reviewer (LO/DP/NB) where there was
201 uncertainty about the relevance for inclusion. Any discrepancies were resolved through
202 discussion and decisions for exclusion were documented.

203 **Data extraction and risk of bias assessment**

204
205 A single reviewer (SR) conducted data extraction for included studies using separate pre-
206 piloted forms for quantitative and qualitative evidence; one reviewer (DP/LO/NB) checked
207 15% of data extraction tables. Extracted information included (i) bibliographic details, (ii)
208 study design, (iii) study participants including details of control groups for quantitative studies,
209 (iv) aims and key features of the intervention, (v) outcomes and outcome measures, (vi) main
210 results, (vii) main conclusions, and (viii) key methodological issues. From the qualitative
211 studies, we extracted participants' own narratives, and then summarised these 'data' in a
212 concise message in data extraction tables. The summary included information on factors (*e.g.*
213 improved self-esteem) reported by older people on the impact of the intervention on their health
214 and wellbeing.

215 All studies were critically appraised by one reviewer (SR). We assessed risk of bias (RoB) and
216 methodological quality using different methods for quantitative and qualitative studies, as
217 explained below. For shorthand, we reported the overall assessment of quality as RoB
218 throughout this paper and we used it as preferred terminology [52]. In the summary tables
219 (Additional file 4 and 5), we used a global assessment for quantitative and qualitative studies.
220 This was used to facilitate reporting of the data in the summary tables and give an indication
221 of the RoB among the different studies. As recommended by the literature [59], we
222 incorporated the RoB assessments into the findings (please refer to the Results section). For
223 the item-level RoB assessment for each study, please refer to Additional file 6 (quantitative

224 studies) and Additional file 7 (qualitative studies). Case studies were assessed using an adapted
225 version of Atkins & Sampson’s tool [62, in 63]. Quantitative studies and quantitative elements
226 of mixed method studies were assessed using the Liverpool Quality Assessment Tools
227 (LQATs) [61]. The forms include (i) selection procedures, (ii) baseline assessment, (iii)
228 outcome assessment, (iv) analysis/confounding, and (v) contribution of evidence towards the
229 review question that are rated as ‘Strong, Moderate or Weak. Qualitative studies and qualitative
230 elements of mixed methods studies were appraised using an adapted version of Harden *et al.*
231 [57,62] and Mays & Pope [63] tools. The form is divided into sections covering study context,
232 methodology, use of strategies to increase reliability and validity, and extent to which findings
233 reflected participant perspectives and experiences. A global assessment of validity was made
234 based on whether aspects of the study were clear, adequate, or explicit using this scale.

235 **Synthesis**

236
237
238 The broad focus of interventions fostering respect and social inclusion, and the heterogeneity
239 across study designs and outcomes, precluded meta-analysis [42]. We therefore conducted a
240 narrative synthesis [40,64] comprising four elements:

241 1) We grouped and tabulated studies according to the type of intervention evaluated. A
242 broad range of interventions were identified, including those based on (i) mentoring,
243 (ii) intergenerational programmes, (iii) dancing, (iv) music and singing, (v) art and
244 culture (vi) information-communication technology and (vii) multi-activity
245 programmes (*e.g.* health promotion). To facilitate reporting of the data in the summary
246 tables (Additional file 4 and Additional file 5) and to give an indication of the potential
247 RoB among the different studies, we ranked quantitative and qualitative studies based
248 on a ‘global assessment’ (from lower to higher RoB).

249 2) For each intervention category we produced a narrative summary of findings, grouping
250 studies according to whether they produced similar results, measured the same
251 outcomes, and/or shared a theoretical basis [64]. RoB was discussed in each narrative
252 summary [59].

253 3) We used Harvest plots to graphically represent the quantitative findings, including RoB
254 for each intervention (Table 1). These plots represent an overall summary of the
255 quantity, direction and strength of the evidence for the various health outcomes [47].

256 4) **Logic model development:**

257 As explained earlier, based on scoping work, we generated logic models for (1)
258 intergenerational interventions, and 2) information and communication technology
259 interventions. The initial construction of the logic models (pre-review) helped us to
260 conceptualise possible outcomes and mechanisms through which interventions on
261 social inclusion might produce effects on health outcomes. Successively, based on the
262 evidence retrieved, we assessed whether the mediating factors and outcomes that we
263 depicted in the initial logic models were supported by the evidence (see Figures 3-4).

264 **Diagrams development:**

265 Diagrams were developed during the narrative synthesis process. They represent a
266 descriptive overview of the quantitative and qualitative evidence retrieved, for each
267 intervention type.

268 The mediating factors included in the diagrams came from the participants' own
269 narratives that emerged from the qualitative studies (on how older people reported the
270 impact of the intervention). They offer some explanations about possible mechanisms
271 through which interventions on respect and social inclusion may impact on older
272 people's health (*e.g.* feeling valued). The diagrams also present the list of outcomes
273 being studied by the qualitative and quantitative studies (including number of studies),

274 and the effect for quantitative studies (see Figures 5-10). We have not included the
275 assessed risk of bias (RoB) in these diagrams, as the RoB is presented in the Harvest
276 Plot (Table 1).

277 **Results**

278 279 **Study selection**

280 Of the initial 27,354 references retrieved, 259 were filtered for full paper review after screening
281 titles and abstracts. Of these, 45 records based on 40 studies (23 quantitative, 6 qualitative, 11
282 mixed methods) met the inclusion criteria of the review (Figure 1). The PRISMA flow diagram
283 of the study selection process is shown in Figure 1.

284 *Title: PRISMA flow diagram of the study selection process.*

285 [Insert Figure 1 PRISMA flow chart]

286 **Study characteristics**

287
288 Additional File 4 summarises the characteristics of the quantitative studies; and Additional File
289 5 presents the characteristics of the qualitative studies. Table 1 shows the Harvest Plot, which
290 represents a brief overview of the strength of the quantitative evidence for the various health
291 outcomes and the RoB of the studies. In Figure 2, the number of qualitative and quantitative
292 studies is stratified by intervention category (n=40).

293 [Insert Figure 2]

294 *Title: Quantitative and qualitative studies stratified by intervention category.*

295 Studies using mixed methods designs contributed to both quantitative and qualitative evidence.
296 Thirty-four studies provided quantitative evidence, and 14 studies qualitative evidence. One
297 study [65] contributed to both the mentoring and intergenerational interventions; and another
298 [66] contributed to both singing and art and culture interventions.

299 **Study design:** Of the 34 studies reporting quantitative evidence, seven adopted individual or
300 cluster randomised controlled trials (RCT), with the rest using quasi-experimental designs –
301 four were controlled before and after studies, seven were cluster or individual controlled studies
302 and 15 were uncontrolled before and after studies. Studies reported a range of
303 comparison/control groups including: other interventions not related to respect and social
304 inclusion (*e.g.* weekly recreational activities) (n=2), usual care (*e.g.* through routinely available
305 health, social and voluntary care services) (n=2), other activities (*e.g.* hobbies) (n=5) and older
306 people selected from waiting lists (n=2). One study used multiple comparison groups [67].

307 Most studies had only one follow-up assessment conducted between two weeks and eight
308 months after initiation of the intervention/baseline measurements.

309 Of the 14 studies reporting qualitative evidence, the methods used included: focus group
310 discussions (n=3), interviews (n=7), a mix of focus groups and interviews (n=2), diary writing
311 (n=1), observation (n=1) and qualitative comments offered in response to open questions
312 included in the questionnaires (n=1).

313 **Setting:** All studies concerned higher and upper middle-income countries. Thirteen were from
314 the UK, 13 from the United States, three from Japan, two each from the Netherlands, Australia,
315 Canada, and Brazil and one each from Spain, Italy, and China.

316 **Population:** The majority of studies included healthy older people aged between 60 and 95
317 years, with the exception of two studies that included older people with dementia [68,69], and
318 three studies that included older people with Parkinson's Disease [70–72].

319 Most studies comprised a majority of women, with only one study reporting an even balance
320 between women and men [65], and one study including women only [73]. In most studies,
321 participants were either volunteers currently involved with/interested in the programme or

322 those recruited through fliers and letters. Study participants were also referred by general
323 practices [74], or recruited from day centres [68] and community centres/groups [75,76].

324 **Delivery and frequency of contacts:** Four studies included interventions delivered by peers
325 [77–80], eight were led by the study participants themselves [65,76,81–86], one involved both
326 professionals and students [87], four were led by study participants with some support from
327 helpdesk and community centres [67,88–90] and 19 studies were led by professionals [66,69–
328 75,91–103].

329 The frequency of contact with participants varied, with most interventions being delivered on
330 a weekly or other periodic basis (*e.g.* every two weeks). Most interventions lasted between
331 three and 12 weeks, with a few lasting for extended periods (26 weeks [73], 30 weeks [66],
332 and three years [96]). In one study, the intervention duration was not clear [85].

333 **Outcomes:** Impacts were reported on: depression (n=20); subjective health (n=7); mental
334 health (n=4); wellbeing (n=8); physical health (n=7); quality of life (n=7); falls (n=4);
335 perceived stress and anxiety (n=3) and chronic pain (n=1). See Additional file 3 for an overview
336 of the scales used for the quantitative studies in measuring outcomes. Most of the included
337 studies used standardised scales, with only a few studies using non-standardised measures for
338 subjective health [66,79,82,104], falls [70,76], and quality of life outcomes [78,95].

339 **RoB:** Overall, 12 studies were rated as high and medium-high RoB [65,69,70,72–
340 74,76,78,85,95,103,105] 12 studies as moderate RoB [70,71,75,80,83,84,93,94,97,98,100,102]
341 and 21 as low or low-moderate RoB [66–68,77,79,81,82,86,87,89,90,92,96,98–100,106–108].

342 The main RoB issues with these studies included small sample size, poor selection of
343 participants, and differences observed between intervention and control group participants at
344 baseline.

345 **Mediating factors:** Of the 14 studies reporting qualitative evidence, the most common
346 mediating factors explored were: improved self-confidence and self-esteem; feeling valued;
347 improved social relationships, and interactions; reduction of social isolation; feeling of
348 happiness and enjoyment; and feeling more physically active.

349 **Development of logic models: pre-and post-review**

350

351 To illustrate how the logic models evolved thorough the review process, Figure 3 shows the
352 logic model that we initially developed for intergenerational interventions (pre-review).

353 [Insert Figure 3 logic model]

354 *Title: Logic model for intergenerational initiatives based on scoping work (pre-review).*

355
356 Based on the evidence retrieved, we assessed whether the hypothesised mediating factors and
357 outcomes were supported by the evidence. As shown in the final version of the logic model
358 (Figure 4), through the review, we were able to identify some of the activities that constitute
359 intergenerational interventions (*e.g.* reading books to children, and assisting young people in
360 school activities). From the quantitative evidence, which looked at the impact of the
361 interventions, we generated some additional outcomes (*e.g.* depression). From the qualitative
362 data, which provided information on how interventions might work according to older people's
363 narratives, we generated some additional mediating factors (*e.g.* feeling valued) that could be
364 involved in the process of improving health outcomes.

365 [Insert Figure 4 logic model]

366 *Title: Final version of the logic model for intergenerational interventions (post review).*

367

368 **Results by intervention category**

369

370 For each intervention category, the number of studies, type of study design and RoB for each
371 study are presented with a summary of the main findings (both quantitative and qualitative

372 evidence). For a quick overview of the strength of the quantitative evidence and the RoB of the
373 studies, please refer to the Harvest plot (Table 1). For a more detailed explanation of the
374 findings and RoB for each study, please refer to Additional file 4 (quantitative studies) and
375 Additional file 5 (qualitative studies). The item-level RoB assessment for each study can be
376 found in Additional file 7 (quantitative studies) and Additional file 7 (qualitative studies).

377 Whilst many studies reported stratification by socio-economic status, education, and gender at
378 baseline, few reported sub-analyses of health outcomes by age, ethnic or education of older
379 people.

380 **Mentoring interventions**

381
382 Two quantitative studies looked at mentoring (Additional file 4): an individual RCT of a
383 community-based mentoring service programme rated as low-moderate RoB [77] and an
384 uncontrolled before and after study of an intergenerational mentoring programme rated as high
385 RoB [65]. Differences observed between comparison groups at baseline [77] and small sample
386 sizes [65] made it difficult to interpret the results.

387 One study found no effect on depressive symptoms (mean difference (MD)=0.2; $p = 0.29$;
388 [77]), and although it showed a significant improvement in subjective health at six months'
389 follow-up (MD= -0.09; $p < 0.01$), this improvement was significantly less than controls (MD=
390 -0.1; $p < 0.01$) [77]. Two studies found no effect on mental health (MD= 0.8; $p = 0.48$: [77];
391 MD and p values not reported in the study by Ellis [65]) and physical health (MD= 0.1; $p =$
392 0.90: [77]; MD and p values not reported in the study by Ellis [65]). A further study did not
393 observe an effect of mentoring on quality of life (MD and p values not reported in the study by
394 Ellis [65]). .

395 One qualitative study included a mentoring programme, where older people acted as mentors
396 for pre-school children [85] (Additional file 5). It included limited reporting of analysis,

397 sampling, and results. From the older people's narratives, mentoring children was reported to
398 help participants going through difficult times in their lives, and to enhance their physical and
399 mental wellbeing. Reported factors that might lead to an improvement in wellbeing were:
400 improved self-esteem, satisfaction, confidence, interactions, and relationships, and feeling
401 valued (Figure 5).

402 [Insert Figure 5]

403 *Title: Diagram showing descriptive pathways from mentoring interventions to health outcomes.*

404 **Intergenerational interventions**

405
406 Intergenerational studies included (i) mentoring initiatives [68,81], (ii) interventions based on
407 service-learning pedagogy [87], (iii) school initiatives [76,82,105], (iv) reading initiatives
408 [83,84], (v) reminiscence initiatives [75], and (vi) interventions involving reading and drawings
409 [103].

410 Eleven quantitative studies included Additional file 4): one individual RCT [76]; one cluster
411 RCT [81]; two cluster controlled trials [83,84], two controlled before and after studies [82,87];
412 five uncontrolled before and after studies [65,68,75,103,105]. Seven were judged as low-
413 moderate RoB, with four being moderate-high RoB [65,76,103,105]. The main weaknesses of
414 these studies were small sample size (n=2) [103,105] and lack of a control group (n=2)
415 [103,105]. Reporting of analysis was limited in three studies [65,76,105].

416 Five studies found a significant effect on depression scores (reduction of 62% within two weeks
417 after the completion of the programme; MD= 1.86; p value not reported in study [68]; reduction
418 of 26.3% obtained in the post-treatment evaluation; MD= 3.53 p <.001: [87]; reduction of
419 18.5% at 2 years' follow-up; MD=0.94; p<.001: [82]; reduction of 14%; MD= 0.31; p <.10:
420 [84]; reduction of 16.64% at six-eight weeks' follow-up; MD and p value not reported in study
421 [105]), while one study found no effect at eight-weeks' follow-up (MD= -0.97; p=0.3: [103]).

422 One study showed a significant favourable effect on self-rated health scores at 21 months'
423 follow-up ($p < 0.01$; MD not reported in the study by Fujiwara et al.[104]), while one study did
424 not find an effect at 4 months' follow-up ($p = 0.554$; [81]). For quality of life scores, two studies
425 showed some indication of an effect (increase of 4.4% in the subscale of past, present, and
426 future activity after the completion of the programme; MD= -0.65; $p = .05$:[75]; increase of 7%;
427 MD= -1.91; p value not reported in the study by Chung et al. [68]). One study (high RoB) did
428 not observe an effect on quality of life, physical health and mental health [65]. In one study,
429 participants experienced a non-significant decrease of more than 50% in falls rates at 4-8
430 months' follow-up ($p = 0.17$) [76].

431 Three qualitative studies, of low-moderate RoB, were included (Additional file 5). Participants'
432 narratives identified some factors mediating the impact of wellbeing, subjective health, and
433 depressive mood [85,86,89] (Figure 6). These included: improved self-esteem and confidence,
434 enjoyment and satisfaction, and happiness; improved interactions and relationships with others;
435 feeling valued, and positive perceptions towards ageing and children. Older people's narratives
436 reported a perceived enhanced emotional and physical wellbeing and subjective health
437 [85,86,89]. In a study conducted by De Souza [86], the female participants reported that the
438 project helped to alleviate their depressive moods and to improve their overall wellbeing and
439 humour.

440 [Insert Figure 6]

441 *Title: Diagram showing descriptive pathways from intergenerational interventions to health outcomes.*

442 **Dancing interventions**

443
444 Two quantitative studies were included (Additional file 4): an individual RCT [71] and an
445 individual controlled trial [70]. They were both rated as high and moderate RoB [70,71] due to
446 differences between control and intervention groups in the depression levels at the outset of the
447 study [71] and small samples [70,71].

448 One study showed significant reduction in depression scores [71] (older people with
449 Parkinson's Disease: MD= 0.26, p= 0.001; older people without Parkinson's Disease: MD
450 0.52, p= 0.001). Neither study found an effect on wellbeing and subjective health between two
451 weeks and six-eight months' follow-up [70]. Findings were mixed for falls rates, with one study
452 showing a significant reduction in falls (MD and p values not reported in the study by Hackney
453 et al. [71]), and the other showing no effect [70].

454 Two qualitative studies provided context to the relationship between dancing and subjective
455 and physical health, subjective health, and wellbeing [70,72] (Additional file 5). The main
456 weaknesses of the studies included limited reporting of sampling, analysis, and results.
457 Participants' narratives identified some factors mediating the impact of physical health,
458 subjective health, and wellbeing, and these (Figure 7) comprised: improved satisfaction,
459 enjoyment, confidence; improved fluency, dynamics of movement and mobility; improved
460 social interactions, and feeling valued. Older people talked about how the programme made
461 them 'feel better', giving them a sense of wellbeing [72], and made them feel good and capable
462 despite some health difficulties [70].

463 [Insert Figure 7]

464 *Title: Diagram showing descriptive pathways from dancing interventions to health outcomes.*

465 **Music and singing interventions**

466
467 There were six quantitative and two qualitative studies that explored the impacts of music
468 [93,101] and singing initiatives [66,69,91,94,102,109]. The six quantitative studies included
469 (Additional file 4): a cluster RCT [108]; an individual RCT [66]; a controlled before and after
470 study [93]; and three before and after uncontrolled studies [69,92,94]. Three were judged as
471 low-moderate RoB [66,92,108], two as moderate RoB [93,94] and one as high RoB [69]. The
472 main issues were short follow-up [69,94], small sample size [69,94] and poor adjustment for
473 potential confounders [93].

474 With regard to psychological outcomes, one study [91] found a significant reduction of 36.6%
475 in depression scores at three months' follow-up (MD= -1.52, $p<0.01$), and of 12.5% at 6
476 months' follow-up (MD= -0.53, $p=0.14$). The same study [91] found a significant reduction of
477 31.1% in anxiety scores at 3 months' follow-up (MD= -1.78, $p<0.01$). Two studies showed no
478 effect on reduction in depressive symptoms at 12 months [66] and 8 weeks' follow-up [94].
479 One study showed a reduction of 27.3% in perceived stress scores (MD= 2.58, $p<0.001$: [92]).
480 Two studies found a positive effect on mental health. One study showed a significant
481 improvement of 9.4% in mental health-related quality of life scores (MD= 4.77; $p <0.01$) at 3
482 months' follow-up; and of 5% at 6 months' follow-up (MD= 2.35 $p=0.05$). Another study
483 found an improvement of 14.3% in mental health scores (vitality subscale: MD= 10.4; $p= 0.03$)
484 at 8 weeks' follow-up [94].

485 Two studies found a positive effect on physical health. One study showed an improvement of
486 14.3% in the vitality subscale (vitality subscale: MD= 10.4; $p= 0.03$) at 8 weeks' follow-up
487 [94]. Another study found an increase of 9.03% in physical health scores (MD= 0.72, $p<0.01$:
488 [66]) at 12 months' follow-up.

489 For quality of life and wellbeing, results were mixed: one study [93] found an improvement in
490 two components of the wellbeing and quality of life scale (increase of 14% in control; MD
491 1.15; $p=.0001$; increase of 7.6% in pleasure; MD 0.8; $p=.0001$) at 9 months' follow-up; and the
492 other study found no effect [69]. One study showed a significant reduction of 104% in falls
493 rates (MD: -0.32; $p<.05$: [66]) at 12 months' follow-up.

494 Two qualitative studies at low-moderate RoB, gave context to the relationship between singing
495 and music initiatives and the health outcomes [102,106] (Additional file 5). Older people
496 reported that music making activities resulted in a better quality of life (*e.g.* enjoyment), mental
497 health benefits (*e.g.* ability to cope effectively with stress), and physical health (*e.g.* good for

498 asthma and breathing) [102,106]. Participants' narratives identified some factors mediating the
499 impact of various health outcomes (depression, anxiety, perceived stress, mental health,
500 physical health, wellbeing, and quality of life). These included improved confidence,
501 concentration, and sense of achievement, feeling valued, and improved interactions with others
502 (Figure 8).

503 [Insert Figure 8]

504 *Title: Diagram showing descriptive pathways from singing and music interventions to health outcomes.*

505 **Information-communication technology (ICT) interventions**

506 Three quantitative studies were included (Additional file 4): two individual RCTs [67,95] (low
507 and moderate RoB), and one controlled before and after study [78] (moderate-high RoB).

509 Three studies found a non-significant reduction in depression scores (MD= -1.4; p=0.56 [67];
510 -0.12 decrease on a 0-15 scale; p value not reported in the study by Woodward *et al.* [95]; 0.2
511 increase on a 0-15 scale; p value not provided in the study by Woodward *et al.* [78]). One study
512 [67] found non-significant reduction in anxiety scores (MD= -0.25; p=0.56), improvement in
513 mental health (MD=1,03; p=0.10) and physical health (MD= 2.63, p=0.14). Findings were
514 mixed for the two studies looking at quality of life outcome scores, with one intervention
515 showing an improvement (4.99 increase on a 16-112 scale; p<.05) [95]) at 6 months' follow-
516 up, and the other showing no effect (6.1 increase on a 16-112 scale; p value not provided in the
517 study by Woodward *et al.* [78]).

518 One qualitative study (moderate RoB) [80] reported a perceived improvement in wellbeing
519 (Additional file 5). Study participants related their enhanced sense of wellbeing acquired from
520 using Information Communication Technology (ICT) to an increased sense of purpose, and
521 enjoyment to their lives. Some older people reported the programme served as a medium for
522 strengthening existing relationships. Others mentioned that having ICT as a common interest
523 brought them closer to family members. Other factors mediating the impact of wellbeing

524 included improved health maintenance, satisfaction, civic engagement, and feeling valued
525 (Figure 9).

526 [Insert Figure 9]

527 *Title: Diagram showing descriptive pathways from information-communication and technology interventions to health*
528 *outcomes.*

529 **Art and culture interventions**

530
531 Five quantitative studies were included (Additional file 4): one individual controlled trial [66],
532 and four before and after uncontrolled studies [74,96,98,110]. Studies were rated as low-
533 moderate RoB (n=2) [66,96], moderate RoB (n=2) [97,98] and high-moderate RoB (n=1) [74].
534 Study weakness included small sample size, no control group and adjustment for known
535 confounders not reported.

536 With regards to psychological outcomes, two studies showed non-significant reductions in
537 depression scores at 2 years' follow-up (MD= 0.7: [96]) and at 12 week's follow-up (MD= -
538 0.7: [66]). One study showed no effect on mental health at one month follow-up (MD= -2.8;
539 p=.154: [98]).

540 One study found a significant improvement of 21.1% in physical health scores (MD= -11.9;
541 p=.030: [98]) at one-month follow-up. Two studies found a significant effect on subjective
542 health scores (increase of 14%; MD= -0.4; p<.10: [96] at 2 years' follow-up; increase of 9%;
543 MD= 0.72; p< .01:[66] at 12 weeks' follow-up.

544 In terms of wellbeing scores, one study found a significant effect (increase of 27.6%; MD= -
545 20.2; p=.002:[98]), and one found no effect (MD= -6: [74]). One study did not find an effect
546 on health-related quality of life scores (MD= not reported; p=0.88: [97]). One study showed a
547 significant reduction in falls rate (reduction of 104%; p< .05: [66]) and another on chronic pain
548 scores (reduction of 23%; MD= 0.5; p< .05: [96]).

549 Three qualitative studies were included (Additional file 5). Participants' narratives provided
550 context to the association of art and culture interventions with health outcomes (depression,
551 anxiety, perceived stress, wellbeing, quality of life, and chronic pain), Older people described
552 how creative work helped them to reduce their feelings of stress and anxiety, and to overcome
553 some health limitations (e.g. depression) [96,111]. They also reported feeling more socially
554 and physically active, and feeling more relaxed [96]. Other factors mediating the impact
555 included reduced social isolation, increased self-confidence, social connectedness, improved
556 social interactions, and feeling valued (Figure 10).

557 [Insert Figure 10]

558 *Title: Diagram showing descriptive pathways from art and culture interventions to health outcomes.*
559

560 **Multi-activity interventions**

561
562 Five quantitative studies were included: an individual RCT [99]; two individual controlled
563 trials [73,79]; and two before and after uncontrolled studies [100,107] (Additional file 4).
564 Studies were rated as low to moderate RoB (n=3)[79,99,107], moderate RoB (n=1) [100] and
565 moderate-high RoB (n=1) [73] – due to no random allocation of the intervention or control
566 groups, and convenience sampling methods.

567 Multi-activity interventions included (i) projects to encourage older people to participate in
568 various activities organised in the city [99], (ii) creative exercise and/or cultural activities
569 wherein older people were guided by peers [100], (iii) regular gatherings in neighbours' homes
570 and interactions with others [107], (iv) social clubs and exercise programmes [79,90], and (v)
571 regular meetings to discuss health information topics including people's feelings and health
572 [73].

573 Findings for psychological outcomes were mixed. One study found a significant reduction of
574 13.4% in depression scores at 6 months' follow up (MD= 0.60; p<0.02: [100]) and of 11.6%

575 at 12 months follow-up (MD= 0.56; $p < 0.05$: [100]). By contrasts, two studies did not find an
576 effect (MD= 0.03 at 9 months' follow-up: [107]; MD 0.4 at 6 months' follow-up: [99]) One
577 study showed a significant improvement of 6.24% in mental health scores (MD= 3; $p < 0.005$:
578 [100]) but at the first follow-up only (6 months). One study found a significant reduction of
579 11.7% in perceived stress scores (MD= 2.23; $p < 0.001$ at 9 months' follow-up:[107]).

580 Two studies found a positive effect on subjective health scores (increase of 5.15%; MD= 0.37;
581 $p < 0.01$ at 3 months' follow-up:[79]; increase of 4.2%; MD= 1.57; $p = 0.06$ at 12 months' follow-
582 up: [100]). One study found a positive effect on wellbeing scores (increase of 9%; MD= -1.9;
583 $p = 0.039$: [99]) at 6 months' follow-up. By contrast, two studies did not find an effect on
584 wellbeing (MD= 0.42: [79]; MD= 1.47: [73]).

585 Two qualitative studies were included (Additional file 5). Participants' narratives gave insight
586 on the relationship between multi-activity interventions and reduction in depression [100],
587 wellbeing [90], and improved physical health [90,100] (Figure 11). These included (i)
588 improved attention to self-care, self-worth, enjoyment, (ii) improved social interactions and
589 (iii) and feeling valued. Older people reported perceived psychological and physical health
590 benefits including 'feeling better', increased flexibility and strength.

591 [Insert Figure 11]

592 *Title: Diagram showing descriptive pathways from multi-activity interventions to health outcomes.*
593

594 **Discussion**

595
596 This is the first systematic review to report on the health impacts of interventions promoting
597 respect and social inclusion in community-residing older people. By drawing on data from both
598 quantitative and qualitative studies, it uniquely furthers our understanding of the pathways that
599 may lead to improved health and wellbeing.

600 **Summary of findings**

601
602 Intergenerational and music and singing interventions (for which there was the largest evidence
603 base: fourteen studies for intergenerational initiatives, and eight studies for singing and music
604 interventions), art and culture, and multi-activity interventions showed an overall positive
605 effect on various health outcomes. Quantitative studies identified impacts on: depression (n=3);
606 wellbeing (n=3); subjective health (n=2); quality of life (n=2); perceived stress and mental
607 health (n=2); physical health (n=2). In contrast, due to a paucity of evidence for mentoring,
608 dancing, and ICT interventions, it was not possible to make a judgement of the impact on health
609 outcomes.

610 Qualitative studies identified some mediating factors (*e.g.* improved self-esteem) that may lead
611 to improvements in health outcomes. For instance, in most intergenerational initiatives (Figure
612 6), older people were regularly involved in assisting young people in school activities (*e.g.*
613 math problems), and reading books to pre-school children. It appears that regular interaction
614 with young people may have led older people to feel more valued, included, and appreciated.
615 As a result, older people reported enhanced subjective health.

616 **Findings in relation to the literature**

617
618 A number of reviews have explored the links between different social aspects of ageing and
619 health outcomes [112–120]. For instance, the Centre for Reviews and Dissemination (CRD)
620 [121] has provided a summary of several systematic reviews of interventions addressing social
621 isolation and loneliness in older people [112–117]. Although related, social isolation and
622 loneliness differ from the concept of social inclusion adopted in this study. Social isolation
623 mainly refers to the quantity and quality of social support or contact received by others [112].
624 The same applies for loneliness, which is defined as “a subjective concept resulting from a
625 perceived absence or loss of companionship” [112]. Dickens *et al.* [112], looked at both one-

626 to-one and group-based interventions targeting social isolation and loneliness. They found that
627 group-based interventions (*e.g.* psychosocial activity group) were more likely to have a positive
628 effect on at least one of the four social health sub-domains if compared with the one-to-one
629 interventions (*e.g.* volunteer home visiting intervention). As we were interested in interventions
630 focusing on making people valued and part of the community, we included only group-based
631 interventions.

632 Previous reviews have looked at health impacts of specific interventions, including music
633 [122], computer and internet training [117], dancing [123,124], and gender-based interventions
634 [118]. In her scoping review, Milligan *et al.* [118] assessed the evidence for the impacts of
635 gendered social interventions (*Men's Sheds*) on the health and wellbeing of older men. There
636 are some similarities with our review, in terms of the complexity and typology of interventions
637 as well as the approach used to synthesise the evidence of these studies. Firstly, although very
638 specific, *Men's Sheds* interventions aim to encourage older men to meet and socialise, learn
639 new skills, and take place in a community setting. Secondly, Milligan *et al.* [118] included
640 qualitative and quantitative evidence, and found that interventions were heterogeneous
641 particularly in terms of (i) methodology, (ii) outcome measures and (iii) variety of activities
642 within the interventions. Thirdly, the main weakness of their studies included low sample
643 representativeness and lack of control group. All these aspects contributed to challenges in
644 synthesising evidence of the health benefits of these interventions, as in our review.

645 Other reviews have focused on a diverse range of interventions, but examined the effect on
646 specific health outcomes. For instance, Lafortune *et al.* [119] examined the effectiveness and
647 cost-effectiveness of various interventions promoting healthy behaviours (*e.g.* diet, physical
648 activity/inactivity, alcohol, smoking, cognitive activity, and risk reduction relating to loneliness
649 and isolation) and their impact on primary prevention or delay of cognitive decline or dementia.
650 They reported that interventions promoting social participation were associated with an overall

651 positive impact on cognitive outcomes. Similarly to our review, they found that reading to
652 children in schools or art sessions may improve social, mental or physical health of older
653 people. Disadvantaged groups were also underrepresented, with many studies being
654 heterogeneous in intervention types and/or outcome measures.

655 The scope of our review includes all types of interventions that aimed to improve respect and
656 social inclusion in older people, and assessed associated impacts on health and wellbeing. Only
657 six studies [66,67,71,76,95,104], included in the reviews mentioned above
658 [112,117,119,120,122,124,125], were directly concerned with older people and with the
659 definition of interventions promoting respect and social inclusion adopted in this study.

660 **Strengths and Limitations**

661
662 We adopted a comprehensive and systematic approach for reviewing the evidence on a
663 complex topic. All study designs were considered, and our inclusive approach allowed us to
664 include a range of intervention types and health outcomes, and positive and negative effects,
665 which we attempted to summarise in the Harvest plot (Table 1). The search was restricted to
666 studies published in English, and this may have introduced language bias since significant
667 results are more likely to be published in English-language journals than those reporting non-
668 significant results [126]. This may also explain why all included studies concerned higher and
669 upper middle-income countries. Due to the heterogeneity of the included studies, we used a
670 narrative synthesis approach to summarise the findings of studies of this review. We were
671 therefore unable to quantitatively assess publication bias by, for example, looking for funnel
672 plot asymmetry [40].

673 We used the LQATs to assess the RoB of quantitative studies. LQATs have been used in a
674 number of previous systematic reviews [127,128] and have been critically examined in relation
675 to other quality appraisal tools [129]. Qualitative studies were appraised using established

676 criteria related to reliability and validity of findings developed by Harden *et al.* [62] and Mays
677 & Pope [63]. Whilst these tools have been used extensively, the global assessment approach
678 that we used was not previously validated in the appraisal of the original tools. An important
679 limitation of this systematic review is that the majority of the review work was conducted by
680 one reviewer, and some eligible studies may have been missed [40].

681 By drawing on both quantitative and qualitative evidence, we have explored both the
682 effectiveness of relevant interventions (primarily quantitative evidence), and the mediating
683 factors to improve health and wellbeing outcomes (primarily qualitative evidence). We feel
684 that this approach has led to a better overall understanding of the current evidence base on
685 interventions on respect and social inclusion in older people than would not have been possible
686 using either quantitative or qualitative evidence alone [35,130]. Qualitative studies helped us
687 to understand some of the complexity of the wide range of components of each intervention
688 and to clarify some aspects of the complexity related to *how* and *why* interventions may work
689 or not work [29,46,130]. By doing so, qualitative studies contributed to the assessment of
690 causality.

691 **Public health and policy implications**

692
693 Many of the interventions reviewed were delivered as projects to selected groups, raising
694 important questions about feasibility of wider implementation and potential for population
695 benefits [131,132]. Our findings suggest that studies mainly relied on people who volunteered.
696 Since these people are generally more willing participate in the community, they may not be
697 representative of the entire population, particularly of ‘hard-to-reach’ older people (*e.g.* those
698 experiencing social exclusion, isolation, poverty, and health problems). Services and other
699 initiatives promoting respect and social inclusion (and similar approaches) should be provided
700 to every older person who stands to benefits from these, and good policies in place should

701 remove the barriers that limit people in most need (*e.g.* marginalised groups) in accessing these
702 interventions [4].

703 **Research implications**

704
705 Many of the interventions included in this review were implemented through weekly and
706 monthly activities (*e.g.* reading books to children). These activities were facilitated by:
707 professionals, students, peers, or older people themselves, and took place in community
708 centres, and schools. Further research should assess the cost-effectiveness of these
709 interventions (including when applied at greater scale in response to population need),
710 particularly those that have shown a positive health impact (singing and music,
711 intergenerational interventions, art and culture and multi-activity interventions).

712 While age, gender, education, ethnic, or socio-economic status of older people were recorded
713 in the data extraction tables, only two studies reported them, and overall the quantity and
714 heterogeneity of the evidence precluded useful analysis of differential effects. Newman *et al.*
715 [105] explored the effect of an intergenerational programme in reducing perceived depression
716 by education level, and age. The study showed that older people in the lower education group
717 (high school) experienced an increase of 1.61% in perceived depression at 6-8 weeks' follow-
718 up. By contrast, those in the higher education group (college) reported a decrease of 26.42%
719 in perceived depression at 6-8 weeks' follow-up. About the effects by age, the older group (70
720 and over) experienced a decreased of 24.27% in perceived depression at 6-8 weeks' post-test,
721 while the younger group (60 and over) reported an increase of 4.77% in perceived depression
722 at 6-8 weeks' post-test (Additional file 4). One qualitative study [86] has reported differences
723 in perceived impacts between males' and females' narratives, such that while male and female
724 participants reported an improvement in subjective health, only females reported that the
725 project helped them to alleviate their depressive moods and to improve their overall wellbeing

726 and humour. Looking at differential effects would be a potentially important topic for future
727 analyses as the evidence base expands.

728 Fifteen studies lacked a control group, making it difficult to be confident that self-reported
729 improvements in psychological outcomes, subjective health, wellbeing, and quality of life were
730 directly attributable to the actual interventions. When interpreting our findings, we should note
731 that some studies may have shown a favourable effect as a result of the Hawthorne effect,
732 whereby participants' awareness of being observed may have engendered beliefs about
733 researcher expectations [133].

734 Considering these challenges, more robust evidence is needed to provide more
735 certain/significant answers about the impact of these interventions. Future studies should (i)
736 take advantage of natural policy experiments fostering respect and social inclusion, and (ii)
737 design better in-depth qualitative studies to explore the influence of context and mediating
738 factors, and (iii) use rigorous methodologies including randomised designs, and (iv) assess
739 whether the most promising interventions are also the most cost-effective.

740 **Conclusions**

741 In the context of an increasing ageing population, it is important to establish what is known
742 about the impacts of interventions that have the potential to improve older people's health. This
743 review suggests that music and singing, intergenerational initiatives, art and culture, and multi-
744 activity interventions may positively impact on wellbeing, subjective health, quality of life,
745 physical and mental health. From the qualitative studies, there was evidence of plausible
746 mediating factors including strengthened social relationships; improved self-confidence and
747 self-esteem; feeling valued; reduction of social isolation; and feeling more physically active.
748 However, the evidence is based on studies with heterogeneous methodologies. Many of the
749 interventions were delivered as projects to selected groups, raising important questions about

750 the feasibility of wider implementation and the potential for population-wide benefits. Future
751 studies which explore potential effect modifiers and mediators will help to strengthen the
752 evidence base and assess whether interventions have the potential to reduce health inequalities.

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795 **List of abbreviations**

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797 WHO: World Health Organisation

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799 PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analyses

800

801 **Declarations**

802 **Ethics approval and consent to participate**

803

804 N/A—No primary data collected

805 **Consent for publication**

806

807 N/A—No primary data collected

808 **Availability of data and materials**

809

810 N/A—No primary data collected.

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812

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820 **Authors' contributions**

821

822 SR, LO, DP and NB developed the idea for the article. SR developed a protocol under the

823 supervision of LO, DP and NB. NKV assisted with data acquisition and extraction. SR wrote

824 the first draft, with all authors contributing to critical revision of the manuscript for important

825 intellectual content. All authors read and approved the final manuscript.

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827

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831 4 software.

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1252 **Figure legends**

1253 **Figure 3**

1254 *Legend: The logic model shows some possible outcomes and mediating factors based on scoping work. OP refers to older*
1255 *people; black dashed arrow represents a relationship/impact; ↓ decrease; ↑ increase; (?) symbol means neutral/do not*
1256 *know.*

1257 **Figure 4**

1258 *Legend: In bold are the mediating factors and outcomes that have been studied by the quantitative and/or qualitative studies.*
1259 *In blue are the additional mediating factors and outcomes identified in this review. OP refers to older people; black dashed*
1260 *lines represent a relationship; ↓ decrease; ↑ increase; ? symbol means neutral/do not know/evidence is inconsistent.*

1261 **Figure 5**

1262 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1263 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1264 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*
1265 *according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional*
1266 *file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of*
1267 *the quantity, direction, and strength of the quantitative evidence for the various health outcomes.*

1268 **Figure 6**

1269 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1270 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1271 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*
1272 *according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional*
1273 *file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of*
1274 *the quantity, direction, and strength of the quantitative evidence for the various health outcomes.*

1275 **Figure 7**

1276 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1277 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1278 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*
1279 *according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional*
1280 *file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of*
1281 *the quantity, direction, and strength of the quantitative evidence for the various health outcomes.*

1282 **Figure 8**

1283 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1284 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1285 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*
1286 *according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional*
1287 *file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of*
1288 *the quantity, direction, and strength of the quantitative evidence for the various health outcomes.*

1289 **Figure 9**

1290 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1291 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1292 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*
1293 *according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional*
1294 *file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of*
1295 *the quantity, direction, and strength of the quantitative evidence for the various health outcomes.*

1296 **Figure 10**

1297 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1298 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1299 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*

1300 according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional
1301 file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of
1302 the quantity, direction, and strength of the quantitative evidence for the various health outcomes.

1303 **Figure 11**

1304 *Legend: This diagram shows an overview of the outcomes that have been studied by the qualitative and quantitative studies*
1305 *(including number of studies), the effect for quantitative studies, and the possible mechanisms for these effects as suggested*
1306 *by the qualitative evidence. The dashed arrows that go from the mediating factors to the outcomes indicate solely that*
1307 *according to some participants' narratives, these factors may contribute to an improvement in health outcomes. See Additional*
1308 *file 4 and 5 for a summary of the studies, and the Harvest plot (Table 1), which graphically represents the overall summary of*
1309 *the quantity, direction, and strength of the quantitative evidence for the various health outcomes.*

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1348 **Additional files**

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1350 **Additional file 1**

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- 1352 • File format: .doc
- 1353 • Title of data: PRISMA 2009 checklist
- 1354 • Description of data: PRISMA 2009 checklist

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1356 **Additional file 2**

1357

- 1358 • File format: .docx
- 1359 • Title of data: Search strategy database(s): Ovid MEDLINE(R) and Ovid
1360 OLDMEDLINE(R)
- 1361 • Description of data: Search strategy MEDLINE

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1363 **Additional file 3**

1364

- 1365 • File format: .docx
- 1366 • Title of data: Overview of the health outcomes and scales used to assess the
1367 interventions on respect and social inclusion (34 studies in total).
- 1368 • Description of data: Overview of the health outcomes and scales used to assess the
1369 interventions on respect and social inclusion

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1371 **Additional file 4**

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- 1373 • File format: .docx
- 1374 • Title of data: Summary of the quantitative evidence of the included studies stratified
1375 by intervention type
- 1376 • Description of data: Summary table for quantitative studies

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1378 **Additional file 5**

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- 1380 • File format: .docx
- 1381 • Title of data: Summary of the qualitative evidence of the included studies stratified by
1382 intervention type.
- 1383 • Description of data: Summary table for qualitative studies

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1385 **Additional file 6**

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- 1387 • File format: .docx
- 1388 • Title of data: Item-level Risk of Bias (RoB) assessment for quantitative studies using
1389 the Liverpool University Quality Assessment Tool (LQAT) (Pope [61]).
- 1390 • Description of data: Item-level Risk of Bias assessment for quantitative studies

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1392 **Additional file 7**

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- 1394 • File format: .docx

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- Title of data: Item-level Risk of Bias (RoB) assessment for qualitative studies using tools adapted from Harden et al. [62] and Mays & Pope [63].
 - Description of data: Item-level Risk of Bias (RoB) assessment for qualitative studies

Table 1 Harvest plot for interventions on respect and social inclusion in older people.

	Mentoring			Intergenerational			Dancing			Music and singing			Information-communication and technology			Art and Culture			Multi-activity		
	Favours contr.	No effect	Favours int.	Favours contr.	No effect	Favours int.	Favours contr.	No effect	Favours int.	Favours contr.	No effect	Favours int.	Favours contr.	No effect	Favours int.	Favours contr.	No effect	Favours int.	Favours contr.	No effect	Favours int.
Depression		■			■	■		■			■	■		■			■			■	■
Anxiety											■			■							
Perceived stress											■										■
Mental health		■			■						■	■		■			■				■
Subjective health	■				■	■		■										■			■
Physical health		■			■						■	■		■						■	
Wellbeing								■			■	■					■	■		■	■
Quality of life		■			■	■					■	■		■	■		■				
Falls					■			■	■			■								■	
Chronic pain																				■	

Legend 1 Each solid bar represents a study. The height of the bar reflects the RoB assigned to that study (high bar: low/low-moderate RoB; medium bar: moderate RoB; low bar: moderate-high/high RoB), so that the strength of the evidence could be determined, and greater weight is given to conclusions from the most methodological robust and reliable studies. See Methods for assessing RoB in quantitative studies.