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Using formative research with older adults to inform a community physical activity programme: Get

Healthy, Get Active

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Using formative research with older adults to inform a community physical activity
programme: Get Healthy, Get Active

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Abstract

Aim: The purpose of this formative study was to explore current knowledge and attitudes towards physical activity, as well as perceived barriers, facilitators and opportunities for physical activity participation among older adults living in the community. The findings have subsequently informed the design, delivery and recruitment strategies of a local community physical activity intervention programme which forms part of Sport England's national *Get Healthy, Get Active* initiative.

Background: There is a growing public health concern regarding the amount of time spent in sedentary and physical activity behaviours within the older adult population.

Methods: Between March and June 2016, 34 participants took part in one of six focus groups as part of a descriptive formative study. A homogenous purposive sample of 28 community dwelling white, British older adults (six male), aged 65-90 years (M=78, SD=7 years) participated in one of five focus group sessions. An additional convenience pragmatic sub-sample of six participants (three male), aged 65-90 years (M=75, SD=4 years), recruited from an assisted living retirement home participated in a sixth focus group. Questions for focus groups were structured around the PRECEDE stage of the PRECEDE-PROCEDE model of health programme design, implementation, and evaluation. Questions addressed knowledge, attitudes and beliefs towards physical activity, as well as views on barriers and opportunities for physical activity participation. All data were transcribed verbatim. Thematic analysis was then conducted with outcomes represented as pen profiles.

Findings: Consistent views regarding both the potential physical and psychosocial benefits of physical activity were noted regardless of living status. The themes of, opportunities and

73 awareness for physical activity participation, cost, transport, location and season/weather
74 varied between participants living in an assisted living retirement home and community
75 dwelling older adults. Further comparative research on the physical activity requirements of
76 older adults living in assisted living versus community settings are warranted.

77

78 [Abstract word count: 300]

79

80 **Keywords:** *Ageing; Focus Groups; Formative; Physical Activity; Community groups;*

81 *Primary care*

82

83 **Introduction**

84 In the United Kingdom (UK) there are over 11 million older adults aged 65 years and over
85 who make up 18 per cent of the population (UK Office for National Statistics, 2017).
86 Aligning with the United States (US) and other developed countries (United Nations, 2015)
87 this proportion is projected to increase to at least 24 per cent by 2039 (UK Office for National
88 Statistics, 2017). Although prolongation of life remains an important public health goal, of
89 even greater significance is that extended life should involve preservation of the capacity to
90 live independently, function well and quality of life (Rejeski *et al.*, 2013). The purpose of this
91 formative descriptive study was to explore current knowledge and attitudes towards physical
92 activity (PA), as well as perceived barriers, facilitators and opportunities for PA participation
93 among older adults living in the community. The findings were used to inform the design,
94 delivery, and recruitment strategies of an ongoing three-year community PA intervention
95 project, *Get Healthy, Get Active* (GHGA), which forms part of Sport England's national
96 GHGA programme (Sport England, 2012).

97

98 **Background**

99 Guidelines issued by the UK Chief Medical Officers and the US Surgeon Generals
100 recommend that older adults (≥ 65 years) engage in at least 150 minutes of moderate (or 75
101 minutes of vigorous) PA per week in bouts of at least 10 minutes, with muscle-strengthening
102 and balance activities included on at least two of those days (Department of Health, 2011;
103 Centers for Disease Control and Prevention (CDC), 2015). Despite the recognised evidence
104 base for the benefits of regular PA (CDC, 2015; Reid and Foster, 2017; World Health
105 Organization (WHO), 2017), objective summaries of PA levels among older adults show that
106 only 15 per cent of males and 10% of females within the UK, and 9.5% of males and 7% of

107 females within the US meet the recommended PA guidelines (Tucker, Welk and Beyler,
108 2011; Jefferis *et al.*, 2014). Given that current PA guidelines remain the same for both adults
109 (18-64 years) and older adults (≥ 65 years), such high levels of inactivity suggests that PA
110 guidelines appear too demanding for the latter population (Booth and Hawley, 2015).

111

112 Accumulating evidence suggests that prolonged and continuous bouts of sedentary
113 behaviours (SB; defined as waking behaviours in a sitting, reclining or lying posture with
114 energy expenditure ≤ 1.5 metabolic equivalents (Tremblay *et al.*, 2017)) have similar physical
115 (e.g., premature mortality, chronic diseases and all-cause dementia risk) and psychosocial
116 (e.g., self-perceived quality of life, wellbeing and self-efficacy) risk factors to that of physical
117 inactivity (Wilmot *et al.*, 2012; Edwards and Loprinzi, 2016; Falck, Davis and Liu-Ambrose,
118 2016; Kim, Im and Choi, 2016). In fact, SB is now an identifiable risk factor independent of
119 other PA behaviours (Tremblay *et al.*, 2017). Spending on average 80% of their time in a
120 seated posture, and with 67% being sedentary for more than eight and a half hours per day
121 (Shaw *et al.*, 2017), older adults are the most sedentary segment of society and seldom
122 engage in moderate-to-vigorous PA (Chastin *et al.*, 2017).

123

124 Several social (e.g., social awkwardness and peer/family support), behavioural (e.g., ageing
125 stereotypes and lack of time), physical (e.g., improved balance and flexibility), and
126 environmental (e.g., transport and neighbourhood safety) correlates of PA among older adults
127 have been noted in recent formative (Schijndel- Speet *et al.*, 2014; Banerjee *et al.*, 2015) and
128 qualitative research (Franco *et al.*, 2015; Devereux-Fitzgerald *et al.*, 2016; Phoenix and Tulle,
129 2017). Such findings are a first step in enabling policymakers and healthcare professionals to
130 implement effective PA interventions and promote active ageing (Franco *et al.*, 2015). Given
131 the potential benefits associated with PA outlined, such interventions have the potential to

132 reduce, age-related morbidity and declines in activities of daily living, maintain muscle
133 strength and mass, improve quality of life, and thus reduce the primary and total health care
134 costs associated with SB and physical inactivity among this population (Bauman *et al.*, 2016).

135

136 Prior research notes that interventions aimed at promoting PA participation should adopt an
137 appropriate conceptual health promotion model to prioritise the key assets of the target group
138 (Plotnikoff *et al.*, 2014). The PRECEDE-PROCEED model of health programme design,
139 implementation, and evaluation (Green and Kreuter, 2005) provides the target population
140 with a comprehensive and structured assessment of their own needs and barriers to a healthy
141 lifestyle. The PRECEDE component of the model comprises of, predisposing, enabling, and
142 reinforcing factors has previously been used as a formative framework to guide PA
143 intervention content and design (Mackintosh *et al.*, 2011; Banerjee *et al.*, 2015). This model
144 has also been adopted as a method for the identification of perceived PA barriers and
145 facilitators among older adults (Banerjee *et al.*, 2015; Gagliardi *et al.*, 2015) and other
146 populations (Mackintosh *et al.*, 2011; Emdadi *et al.*, 2015; Susan *et al.*, 2017).

147

148 The purpose of this formative study was to (i) explore current knowledge and attitudes
149 towards PA, as well as the perceived barriers, facilitators and opportunities for PA
150 participation among older adults living in the community who had agreed to take part in an
151 ongoing PA programme; and (ii) use this data to inform the design, delivery and recruitment
152 strategies of an ongoing community PA intervention programme, as well as international PA
153 interventions among this population. Given the purpose and aims outlined, the Evidence
154 Integration Triangle (Glasgow, 2012) was adopted as the overarching theoretical framework.
155 Through the prompt identification of success and failures across individual-focused and
156 patient–provider interventions, as well as health systems and policy-level change initiatives,

157 the framework allows for the exploration of the three main evidence-based components of
158 intervention program/policy, implementation processes, and measures of progress. Hence,
159 this framework enabled a steep learning cycle through an initial 12-week pilot GHGA
160 programme delivered by the Metropolitan Borough Council within the chosen local authority.
161 Results and analysis from this pilot were fed back to Sport England as the funder, as well as
162 deliverers and participants in order to assess, evaluate and promptly inform adapted future
163 iterations of the GHGA programme.

164 **Methods**

165 *Participants and procedures*

166 A descriptive formative study was undertaken from March to June 2016. Participants were
167 recruited from one local authority in North West England recognised as having the highest
168 percentage of inactive older adults (80%) compared to the UK national average, and the
169 highest national health costs associated with physical inactivity (Active People Survey, 2014;
170 Sport England's Local Profile Tool, 2015). The first author facilitated six, mixed-gender
171 focus groups. Representative of the uptake of participants within the target GHGA initiative,
172 a homogenous purposive sample of 28 community dwelling white, British older adults (five
173 male) participated in five of the focus groups, with an additional convenience pragmatic sub-
174 sample of six participants (three male) recruited from an assisted living retirement home,
175 participating in the sixth focus group. In total, 34 older adults (eight male), aged 65-90 years
176 (M=78, SD=7 years), participated across the six sessions. Four focus groups involved a group
177 size of six to ten participants, and two involved three participants (mean focus group size of 6
178 \pm 5 participants). Previous focus groups in PA studies have been conducted effectively with
179 as many as 12 (Moran *et al.*, 2015), and as few as four (Schneider *et al.*, 2016) participants.
180 Focus groups took place in two church halls, an assisted living retirement home lounge, and a

181 theatre. All locations were free from background noise, and participants could be overlooked
182 but not overheard. The inclusion criterion set out by Sport England as funders of the GHGA
183 programme were that participants must be 65 years of age or over, reside within one local
184 authority in North West England, could provide written informed consent to participate.

185

186 GHGA is an ongoing three-year project which seeks to increase the number of inactive older
187 adults participating in PA at least once a week for 30 minutes, via a 12-week PA intervention
188 delivered by the Metropolitan Borough Council within the assigned local authority.

189 Participants due to participate in GHGA received a covering letter, participant information
190 sheet, and consent form. Prior to the commencement of the study, institutional ethical
191 approval was received (#SPA-REC-2015-329) and written informed consent was obtained for
192 all participants prior to participation. All focus groups utilised the PRECEDE stage of the
193 PRECEDE-PROCEDE model (Green and Kreuter, 2005) within their design allowing for the
194 exploration of predisposing, enabling and reinforcing correlates of PA participation. To
195 maximise the interaction between participants, focus group questions were reviewed by the
196 project team for appropriateness of question ordering and flow. Subsequent minor additions
197 were made to questions on social isolation and PA advertisement. The semi-structured
198 discussion guide included open ended questions structured to prompt discussion with equal
199 chance for participants to contribute (Stewart and Shamdasani, 2014). Focus groups were led
200 by a trained facilitator and with an observer/ note taker also present. Questions addressed
201 knowledge, attitudes and beliefs towards PA as well as views on barriers and opportunities
202 for PA participation. An example question from a section exploring barriers to PA was: "*Can*
203 *you tell me about what stops you from participating in physical activity?*" Questions
204 therefore demonstrated aspects of face validity as they were transparent and relevant to both
205 the topic and target population (French *et al.*, 2015).

206

207 *Data Coding and Analysis*

208 Focus groups lasted between 20 and 45 minutes (M=29, SD=12), were audio recorded, and
209 later transcribed verbatim, resulting in 66 pages of raw transcription data with Arial font, size
210 12 and double-spaced. Verbatim transcripts were read and re-read to allow familiarisation of
211 the data and then imported into the QSR NVivo 11 software package (QSR International Pty
212 Ltd., Doncaster, Victoria, Australia, 2017).

213

214 Previous research within this population has adopted analytical procedures including thematic
215 analysis (Van Dyck *et al.*, 2017), content analysis (Middelweerd *et al.*, 2014) and used
216 specialist qualitative data analysis packages, such as NVivo (Warmoth *et al.*, 2016). In
217 supporting new methodologies and data representation within qualitative research (Orr and
218 Phoenix, 2015), the current study followed the pen profiling protocol. The pen profile
219 approach has been used in recent child PA research (Mackintosh *et al.*, 2011; Boddy *et al.*,
220 2012; Knowles *et al.*, 2013; Noonan *et al.*, 2016b) and presents findings from content
221 analysis via a diagram of composite key emerging themes. In summary, data were initially
222 analysed deductively via content analysis (Braun and Clarke, 2006), using the PRECEDE
223 component of the PRECEDE-PROCEED model (Green and Kreuter, 2005) as a thematic
224 framework which reflects the underlying study purpose. Inductive analysis then allowed for
225 emerging themes to be created beyond the pre-defined categories. Data were then organised
226 schematically to assist with interpretation of the themes (Aggio *et al.*, 2016). As akin to more
227 traditional qualitative research, verbatim quotations were subsequently used to expand the
228 pen profiles, provide context, and verify participant responses. Previous studies have
229 demonstrated this method's applicability in representing analysis outcomes within PA

230 research (Mackintosh *et al.*, 2011; Boddy *et al.*, 2012; Knowles *et al.*, 2013; Noonan *et al.*,
231 2016a) making it accessible to researchers who have an affinity with both quantitative and
232 qualitative backgrounds (Knowles *et al.*, 2013; Noonan *et al.*, 2016a). Recent findings
233 suggest that the discrepancy between objective isolation and felt loneliness may be associated
234 with undesirable health outcomes such as cognitive dysfunction.

235

236 Three pen profiles were developed to display themes within the data aligned to the
237 PRECEDE component of the PRECEDE-PROCEED model (Green and Kreuter, 2005).
238 Quotations were labelled by focus group number (Fn) and subsequent participant number
239 (Pn) within that focus group. Characterising traits of this protocol include details of frequency
240 counts and extracts of verbatim quotes to provide context to the themes. A minimum
241 threshold for theme inclusion was based upon comparable participant numbers within
242 previous research adopting a pen profiling approach (Boddy *et al.*, 2012; Noonan *et al.*,
243 2016a) and hence, was set as $\geq n = 6$, with n representing individual mentions per participant.
244 However, multiple 'mentions' by the same participant were only counted once.
245 Methodological rigour was demonstrated through a process of triangular consensus (Hawley-
246 Hague *et al.*, 2016) between the authors. This offered transparency, credibility, and
247 trustworthiness of the results, as the data were critically reviewed using a reverse tracking
248 process from pen profiles to verbatim transcripts, providing alternative interpretations of the
249 data (Smith and Caddick, 2012). The process was repeated through cross verification and
250 discussion until subsequent agreement on data themes in relation to verbatim extracts was
251 reached (Aggio *et al.*, 2016).

252

253 **Findings and Discussion**

254 *Predisposing Correlates*

255 Figure 1 displays the predisposing correlates of PA participation. In agreement with previous
256 research (Gray *et al.*, 2015; Kosteli, Williams and Cumming, 2016), the most highly cited
257 theme of motivation (n=29) was perceived to be both a facilitator (n=15) and barrier (n=14)
258 to PA participation throughout. Some participants were proactive in seeking out opportunities
259 for PA.

260

261 *I'm a lung cancer survivor and I just ran a mile last month and I raised £550. (Focus group*

262 (F) 1: Participant (P) 2)

263

264 Contrastingly, others expressed disinterest in PA altogether believing that they would not
265 derive any health benefit.

266

267 *I've pushed these [PA] classes to lots and lots of friends and they still ignore it, they will not*

268 *come to anything like this. (F1: P3)*

269

270 Participants also reported laziness or apathy to prevent participation.

271

272 *It's [lack of PA] apathy, just apathy, people can't be bothered. (F4: P3)*

273

274 The importance of pre-intervention intrinsic motivation (e.g., participating for enjoyment)
275 among older adults is key for both initial adoption and maintenance of PA participation (Gray
276 *et al.*, 2015). Hence, future interventions could promote intrinsic motivation for PA through
277 the adoption of socioemotional selectivity theory (Carstensen, Isaacowitz and Charles, 1999).

278 Recent findings support this theory's notion that motivation for PA is more effectively
279 promoted when paired with positive messages about the benefits of PA rather than with
280 negative messages about the risks of inactivity (Notthoff *et al.*, 2016).

281

282 The theme of age (n=20) was identified as a key barrier (n=13) to PA participation
283 throughout.

284

285 *They [older adults] get to a certain age and just give up. (F1: P7)*

286

287 Social norms and cultural misconceptions often influence not only the type of PA in which
288 older adults engage, but whether they participate at all (Greaney *et al.*, 2016). Moreover,
289 participants noted that lifestyle (n=20) often affects individual views regarding ageing
290 stereotypes, and therefore PA participation. Some participants felt that physically active older
291 adults were more likely to be habituated to PA engagement over many years.

292

293 *Well if you've kept healthy, kept fit all your life, you can keep doing it. (F1: P4)*

294

295 Conversely, it was felt that inactive older adults were reluctant to start exercising.

296

297 *You see the ones who haven't been doing it [PA] are not going to be able to start and do it
298 now. (F2: P1)*

299

300 Previous research has also reported prior PA behaviours (e.g., being sedentary or active) to be
301 key correlates affecting older adults' current PA participation levels (Franco *et al.*, 2015).

302 Additionally, ageing is associated with a decrease in the size of social networks and hence,

303 older adults are at increased risks of isolation (Devereux-Fitzgerald *et al.*, 2016; Greaney *et*
304 *al.*, 2016). Corroborating with prior research (Greaney *et al.*, 2016), participants throughout
305 perceived isolation (n=15) to be a key barrier (n=14) to PA participation.

306

307 *It's so easy to get trapped inside and not go out. People sit in front of the television from the*
308 *moment they wake up to when they go to bed. (F6: P5)*

309

310 Isolation is associated with decreased social and psychological wellbeing (Owen *et al.*, 2010;
311 Milligan *et al.*, 2015) and increased SB among older adults (Nicholson, 2012). Certain
312 targeted intervention strategies can reduce isolation by providing an opportunity for older
313 adults from differing socio-economic areas to take part in PA within local community spaces
314 (e.g., parks, leisure centres and churches), that promote social networking by encouraging
315 camaraderie, adaptability, and productive engagement, without the pressure to perform
316 (Milligan *et al.*, 2015; Gardiner, Geldenhuys and Gott, 2016). Given that SB is an
317 independent and modifiable behavioural target for interventions (Lewis *et al.*, 2017),
318 opportunities to replace SB with health-enhancing behaviours such as moderate-to-vigorous
319 PA (Prince *et al.*, 2014), light PA (McMahon *et al.*, 2017; Phoenix and Tulle, 2017) and
320 standing (Healy *et al.*, 2015) should be promoted. However, none of the participants in the
321 current study noted negative health effects of prolonged sitting, or the importance of breaks
322 in sedentary time. Previous research has noted that older adults are not yet familiar with the
323 concept of SB and hence, are not motivated to reduce such behaviours (Van Dyck *et al.*,
324 2017). Hence, it is first crucial to increase knowledge about the negative health consequences
325 of SB independent from PA among both older adults and other populations (Van Dyck *et al.*,
326 2017).

327

328 Participants also emphasised the importance of having a wide range of choice and
329 opportunities for PA (n=22), and in general their perceptions of community provision were
330 positive (n=16).

331

332 *Yes it's quite a good place [the local authority where the study took place]. There are a lot of*
333 *different physical activity sessions to try. (F2: P1)*

334

335 However, in line with recent research (Baert *et al.*, 2016; Träff, Cedersund and Nord, 2017),
336 key barriers noted by the participants within the assisted living group included a lack of
337 advertisement regarding PA opportunities, and few opportunities to take part in PA within the
338 assisted living facility itself.

339

340 *It's hard to know what is on if you don't read the noticeboards and to be honest most of us*
341 *have even stopped looking at that [noticeboard] because there is never anything on it. (F3:*
342 *P3)*

343

344 Further research into the most effective advertisement strategies to engage older adults in
345 assisted living facilities is warranted (Hildebrand and Neufeld, 2009). Regardless of living
346 status, participants noted a strong preference not to engage with online and/or social media
347 channels for advertising and awareness-raising.

348

349 *A lot of people our age don't like that technology stuff at all. I would not know where to start.*
350 *(F5: P2)*

351

352 These results suggest educational strategies outlining the potential benefits of technology in
353 aiding PA participation are needed (Bird *et al.*, 2015). This is especially salient given that
354 recent research has shown technology-based interventions to have good adherence and
355 provide a sustainable means of reducing SB and promoting PA participation among older
356 adults (Garcia *et al.*, 2016; Skjæret *et al.*, 2016).

357

358 < Insert Figure 1 about here >

359

360 *Enabling Correlates*

361 Figure 2 displays the enabling correlates of PA participation. Consistent with previous
362 research findings (Franco *et al.*, 2015; Borodulin *et al.*, 2016), cost (n=21) was perceived to
363 be a key barrier (n=12) to PA participation exclusively among the community dwelling
364 participants who were either unable, or unwilling to pay the perceived high costs associated
365 with both attending and travelling to such programmes.

366

367 *Money is the big bug bear [barrier to PA participation] isn't it. (F2: P5)*

368

369 Examples of competing programmes were also noted, with free and lower cost programmes
370 taking precedence over the more expensive.

371

372 *We like it [a local chair-based PA programme] because it's free. (F4: P3)*

373

374 Thus, to effectively increase PA participation within this population, health-promotion
375 strategies should go further than merely educating and raising awareness about potential

376 health benefits, and should also advocate for the provision of low-cost, and easy reachable
377 PA opportunities regardless of financial status (Petrescu-Prahova *et al.*, 2015; Borodulin *et*
378 *al.*, 2016). It is worth noting that for the participants recruited from the assisted living
379 retirement home, any PA sessions delivered were included within the cost of the overall
380 living fee, and hence lack of financial resources was rejected as a potential barrier for PA
381 participation (Baert *et al.*, 2016).

382

383 Participants' views on the theme of location (n=11) centered on neighbourhood safety.

384 Declining health and physical impairments associated with ageing increase the time spent in
385 ones' neighbourhood and thus, neighbourhood environmental factors such as, PA provision,
386 proximity, traffic volume, and overall neighbourhood safety are considered to be important
387 correlates affecting older adults' PA participation (Greaney *et al.*, 2016). Perceived
388 neighbourhood safety was identified as a barrier (n=7) to PA participation exclusively among
389 the community dwelling older adults.

390

391 *You wouldn't go out on your own at night around here. (F1: P5)*

392

393 Participants from the assisted living retirement home did not view neighbourhood safety to be
394 either a barrier to or facilitator of PA. This neighbourhood environment was perhaps viewed
395 as the norm and therefore they did not associate safety concerns so acutely (Moran *et al.*,
396 2015). This association could have also affected results obtained for the theme time/day of
397 the week as such participants did not recognise this to be a barrier to PA participation either.

398

399 *Time of day wouldn't make much difference [to PA participation]. To be fair you aren't*
400 *doing much at the weekend so day of the week isn't going to make much difference [to PA*
401 *participation] either. (F3: P1)*

402

403 Conversely, community dwelling participants reported time/day of the week to be a barrier
404 (n=15), with early morning or early evening sessions identified as reducing PA participation,
405 especially during the winter months when daylight hours are more limited. These findings
406 could have been further amplified by the neighbourhood safety concerns also identified by
407 this group (Hoppmann *et al.*, 2015; Prins and van Lenthe, 2015).

408

409 The theme of transportation (n=14) has been extensively reported to be both a barrier and
410 facilitator to PA participation among older adults (Bouma, van Wilgen and Dijkstra, 2015;
411 Haselwandter *et al.*, 2015; Kosteli *et al.*, 2016; Van Dyck *et al.*, 2017). Within the current
412 study transportation was identified as a barrier (n=10) restricting access to PA sessions
413 regardless of living status.

414

415 *I would like to go to the baths [swimming pool] but it's difficult to get there and back so I just*
416 *don't bother. (F4: P5)*

417

418 Transport is especially important for those lacking the ability to be more independently
419 mobile as it allows individuals to bridge larger distances than they could by walking alone
420 (Van Cauwenberg *et al.*, 2016). Thus, lack of access to a car and inadequate availability,
421 frequency and reliability of affordable public transport are all associated with decreased PA
422 participation (Newitt, Barnett and Crowe, 2016). Additionally, being dependent upon others
423 (e.g., family, friends and peers) for transportation has been identified as a barrier to PA

424 participation within this population (Baert *et al.*, 2015). This was also noted in the current
425 study.

426

427 *I think the worst thing is having to rely on somebody else to take you [to a PA session] as*
428 *anything can happen in your own life let alone somebody else's.* (F5: P2)

429

430 Prior research suggests the promotion of walking for transportation to PA sessions among
431 physically independent older adults (Chudyk *et al.*, 2017). However, given the
432 neighbourhood safety concerns noted by participants, and the varying levels of functional
433 ability among this population, further research examining access to PA sessions including
434 walking facilities (e.g., path and crossing quality), traffic safety, and safety from crime is
435 warranted (Van Cauwenberg *et al.*, 2016).

436

437 < Insert Figure 2 about here >

438

439 *Reinforcing Correlates*

440 Figure 3 displays the reinforcing correlates of PA participation. Peer support is associated
441 with PA adherence in older adults (Brown *et al.*, 2015), and was identified as a key theme
442 (n=18) and subsequent facilitator (n=13) to PA participation in the current study.

443

444 *I've got to know everybody now and I'm used to you all. I feel more comfortable and I don't*
445 *feel anxious or anything.* (F3: P6)

446

447 Unsurprisingly, in light of the above several participants reported peers to be a barrier to PA
448 participation (n=5) because of an unwillingness to attend other PA sessions due to anxieties
449 about meeting new people.

450

451 *I wouldn't like to go somewhere else as I wouldn't like to walk in on a crowd of new people.*

452 (F3: P6)

453

454 Although group-based activities offer older adults the chance to gain a sense of belonging,
455 enjoyment and establish friendships, designing sustainable exit routes in order to retain the
456 provision of group activities which continue to facilitate, build and retain social bonds post-
457 intervention should be considered by PA programmers and policymakers (Wu *et al.*, 2015).

458

459 In line with recent research (Devereux-Fitzgerald *et al.*, 2016; Smith *et al.*, 2017), family
460 members were identified as being both barriers (n=2) and facilitators (n=4) to PA
461 participation. Specifically, a barrier often reported is overprotectiveness, in which family
462 members may not allow older adults to participate in PA out of concern for their safety or
463 health (Greaney *et al.*, 2016). Participants among the community dwelling groups also noted
464 this.

465

466 *My sons in for a shock that we're coming to this as he's like, 'no long walks, no boat rides',*
467 *he goes 'you're past it.'* (F6: P2)

468

469 Such results suggest a need to educate family members on the importance and benefits of PA
470 among older adults. Educational resources such as the older adults PA guidelines
471 infographics for the, UK (Reid and Foster, 2016), Canada (Canadian Society for Exercise

472 Physiology, 2016), Australia (Australian Government Department of Health and Ageing,
473 2013), New Zealand (Ministry of Health, 2013), and the United States (CDC, 2008) are
474 appropriate tools advocating for older adults to be active safely, and can be understood by
475 family members plus health care providers. Furthermore, the adoption of local/national mass
476 media messages may be a cost effective educational solution at a time when there is a
477 growing ageing population (United Nations, 2015; UK Office for National Statistics, 2017).
478 However, given the resistance to technology-based PA noted in the current study, further
479 educational strategies promoting enjoyable, easy-to-use technology within a family
480 environment are needed for community dwelling older adults (Bird *et al.*, 2015). Participants
481 within the assisted living group did not perceive family members to be either barriers or
482 facilitators to PA participation and thus, further research is needed to identify approaches to
483 involve family members as additional facilitators of PA participation within this group.

484

485 Participants viewed the theme of perceived health benefits (n=23) to be both a facilitator
486 (n=14) and barrier (n=9) to PA participation regardless of living status. Participants were
487 knowledgeable regarding the potential benefits of PA for their physical health.

488

489 *It [PA] loosens all your limbs up.* (F2: P2)

490

491 Participants also noted the potential benefits of PA for their psychological health.

492

493 *The wellbeing [from PA participation] makes you feel better.* (F1: P3)

494

495 Despite the irrefutable evidence demonstrating the benefits of PA among older adults (CDC,
496 2015; Reid and Foster, 2017; WHO, 2017), participants also noted health to be a potential

497 barrier (n=14) to PA participation due to doubts about their capabilities, or fear of causing
498 themselves harm, particularly if they were unfamiliar with it.

499

500 *People have to be sure they can come to PA sessions because my sister had a heart attack...*
501 *and she can't do a lot of these exercises. (F1: P5)*

502

503 To overcome such perceptions, educational strategies at a population level should focus on
504 communicating the role of PA in gaining health benefits for all as well as how well-designed
505 PA programmes can aid in the management of common comorbidities specific to this age
506 group (Gillespie *et al.*, 2012; Hamer, Lavoie and Bacon, 2013).

507

508 < Insert Figure 3 about here >

509

510 Taken together with the findings of recent qualitative studies examining correlates of PA
511 participation among older adults living in both assisted living (Baert *et al.*, 2016; Träff *et al.*,
512 2017) and community dwelling older adults (Fisher *et al.*, 2017; Phoenix and Tulle, 2017),
513 results from this formative research study have been used to inform the design, delivery and
514 recruitment strategies of an ongoing community PA intervention project. Specifically,
515 changes implemented to programme design have included the introduction of, increased
516 intervention duration from six to 12-weeks, maintenance sessions post-initial 12-week
517 intervention, tea and coffee after each session to promote social interaction, and a reduction
518 of early morning and late afternoon sessions. Changes to programme delivery have included
519 the introduction of, participant choice in session activities, videoing participants at week 1
520 and week twelve to show participants their progression, and signposting participants to other
521 local PA programmes. Finally, changes implemented to recruitment strategies have included,

522 improved relationships with general practitioners to enable them to refer participants onto the
523 programme, leafleting in church halls and charity shops, and deliverers attending and
524 subsequently advertising the programme at several Older Peoples' Forums. Such methods
525 could also be adopted throughout similar community PA programmes elsewhere in order to
526 increase programme fidelity, representativeness and effectiveness.

527

528 **Strengths and Limitations**

529 Methodological strengths include the exploration of consensus and associated discussion
530 through the focus groups and subsequent analysis process which allowed insight into the
531 predisposing, enabling and reinforcing correlates of PA participation among older adults.
532 Consistency of themes, data credibility, transferability, and dependability were achieved
533 through the triangulation consensus of data between authors and methods. While this study
534 reiterates important insights into the perceived barriers, facilitators and opportunities for PA
535 participation among both community dwelling and assisted living older adults, value outside
536 of this to the wider research community may be limited due to programme funding which
537 only allowed for formative research strategies to recruit participants who had agreed to take
538 part in an ongoing PA programme. Consequently, sampling bias is a potential issue as it
539 could be assumed that a high proportion of the participants were already inclined to be and/or
540 currently physically active given the positive predisposing comments with regard to
541 motivation towards PA and current lifestyle choices (Costello *et al.*, 2011). This is especially
542 important given that motivators and barriers toward regular PA vary among currently active
543 and inactive adults across the age range (Costello *et al.*, 2011; Hoare *et al.*, 2017).
544 Considering that less than 10% of older adults (≥ 65 years of age) meet the recommended PA
545 guidelines (Jefferis *et al.*, 2014), future research should seek to identify barriers and

546 facilitators among larger sample sizes of currently inactive older adults living within both the
547 community and assisted living facilities.

548

549 Additionally, a small convenience pragmatic sub-sample of participants from one assisted
550 living facility were recruited and hence results cannot be considered representative.

551 Furthermore, men tend to decrease participation in leisure-time PA as they get older; whereas
552 this dose-response is not seen among women (Amagasa *et al.*, 2017). Consequently, there is
553 the possibility of gender bias given the higher number of female participants recruited.

554 However, the sample size, participants' ages and gender distribution are comparable to those
555 reported in two recent studies examining barriers and facilitators to PA participation among
556 older adults (Baert *et al.*, 2015; Moran *et al.*, 2015). Within these two studies the total
557 number of participants was 15 (five male) and 40 (13 male) and the mean age of the
558 respondents was 74 years, and 84 years, respectively. This compares to a total number of
559 thirty-four participants (eight male) with a mean age of 78 years in the current study.

560 Nevertheless, as well as exploring correlates of PA participation in relation to gender,
561 functional status and age differences between the young-old (60-69 years), old-old (70-79
562 years), and oldest-old (80+ years) (Heo *et al.*, 2017), future research should obtain additional
563 participant characteristic data prior to the intervention including, participants' current
564 sedentary time and PA levels, history of PA, family history of PA, ethnicity, employment
565 status, and educational achievements as such have been shown to potentially affect the
566 perceived barriers and facilitators to PA participation among older adults (Greaney *et al.*,
567 2016; Keadle *et al.*, 2016).

568

569 Conclusions

570 Older adults acknowledged the benefits of PA, not only for health but also those relating to
571 socialising, enjoyment, relaxation, and physical and psychological wellbeing. The themes of
572 opportunities and awareness for PA participation, cost, transport, location and season/weather
573 varied dependent upon living status. These findings suggest current living status to be a
574 separate correlate of PA participation among older adults. This data can be used to further
575 strengthen the design, delivery and recruitment strategies of both the target GHGA PA
576 intervention programme and international PA intervention programmes among older adults.
577 Future interventions should consider educational strategies to communicate the role of PA in
578 gaining health benefits for all, reducing SB, and countering the negative implicit attitudes that
579 may undermine PA within this population. Given the small sample of participants in the
580 current study, further comparative research exploring the barriers and facilitators between
581 assisted living and community dwelling, and active and inactive older adults on both national
582 and international levels is warranted.

583

584 Disclosure statement

585 No potential conflict of interest was reported by the authors.

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