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1 **Recruiting older men to walking football: A pilot feasibility study**

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5
6 **Abstract**

7 Context: Walking football (soccer) has recently emerged as a physical activity option targeted
8 at older males to enhance health and wellbeing.

9 Design: This pilot study aimed to examine the feasibility of recruiting and retaining males
10 aged 50 years and over to an 8-week walking football programme in a professional football
11 club.

12 Intervention: Participants were recruited via social media and assigned to an intervention
13 group or a wait-list control group. The intervention group engaged in 1 hour of walking
14 football a week led by a community coach from the professional football club, followed by an
15 optional social session in the club facility. Physiological and psychological outcome
16 measures were obtained onsite at the football club facility (aiding compliance and retention)
17 at baseline and following 8-weeks, from both groups. Semi-structured interviews were
18 conducted after the 8-week programme and 1 year later, to explore motivations for
19 engagement and the social impact.

20 Results: The opportunity to engage in football and the link to a professional football club
21 were key attractions. All participants recruited were overweight, sedentary, exhibited blood
22 pressures outside normal ranges, and all but two were hypertensive. Adherence to the
23 programme was 90% over 8 weeks, and of the participants who were contacted after one
24 year, all (n = 6) had maintained engagement in walking football. Walking football is therefore
25 a feasible, cost-effective method of recruiting and retaining males aged 50 years and over to a
26 physical activity programme, though attrition is to be expected.

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27 *Key Words:* healthy ageing, intervention, male, physical activity, soccer

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29 **Recruiting older men to walking football: A pilot feasibility study**

30 **Introduction**

31 With demographic data indicating the global population to be an ageing one, as
32 evidenced by the increasing share of persons aged 60 years or over (United Nations, 2015),
33 public health organisations now face an array of social and economic challenges.
34 Specifically, whilst conditions such as obesity, cardiovascular disease, and type-2-diabetes
35 constitute major causes of death globally (World Health Organization, 2015), it is those over
36 the age of 50 years that carry the greatest proportion of this chronic disease burden (Dhalwani
37 et al., 2016). Similarly, older individuals are vulnerable to mental health issues with
38 symptoms of loneliness and low self-esteem commonly arising in later life (Stessman,
39 Rottenberg, Shimshilashvili, Ein-Mor, & Jacobs, 2014; Shaw, Liang, & Krause, 2010).
40 Notwithstanding the significant personal consequences for those affected, the economic
41 burden placed on society by such disorders is vast (Wang, McPherson, Marsh, Gortmaker, &
42 Brown, 2011). Cost-effective strategies aimed at promoting healthy ageing and the
43 prevention of chronic conditions are therefore highly desirable. Walking football (soccer) has
44 recently emerged as a physical activity (PA) targeted at older adults, and particularly males
45 over 50 (Arnold, Bruce-Low, and Sammut, 2015; Reddy et al., 2017); however, further
46 research is required to examine the feasibility and attraction of this form of PA within such
47 cohorts.

48 Current PA guidelines propose that individuals who accumulate 150 minutes of
49 moderate-to-vigorous physical activity (MVPA) per week can benefit from substantial
50 improvements in health and wellbeing (World Health Organization, 2010). Yet, objectively
51 measured accelerometer findings from the US and UK show that only 10-15% of older adults

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52 meet these minimum recommended levels, and PA levels tend to decline dramatically with
53 age (Sparling, Howard, Dunstan & Owen, 2015). Older individuals also often suffer from a
54 lack of social engagement, resulting in loneliness and lower levels of psychological wellbeing
55 (Victor, Scambler, Bowling, & Bond, 2005). Regular PA has been associated with significant
56 improvements in psychological wellbeing in older adults (Fox, Stathi, McKenna, & David,
57 2007), and walking at a moderate pace has been suggested to expend sufficient energy to
58 meet the definition of MVPA, and bring improvements in cardiorespiratory fitness (CRF),
59 diastolic and systolic blood pressure (BP), and body-mass index (BMI) (Ainsworth et al.,
60 2000; Anton, Duncan, Limacher, Martin, & Perri, 2011; Murtagh et al., 2015; Okura et al.,
61 2016). Suitable PA interventions should therefore be encouraged to aid healthy ageing and
62 psychological wellbeing, but evidence shows current interventions aimed at reducing social
63 isolation often come too late in life (Glymour & Osypuk, 2012). Despite the many benefits of
64 walking, advice to be more active has only resulted in short-term effects, leaving scope for
65 more attractive, structured PA initiatives (Hillsdon, Thorogood, White, & Foster, 2002).

66 Older men are less likely to engage with established forms of group PA such as
67 walking groups, as these fail to match their interests or sense of male identity (Baker, 2012).
68 Football can act as a draw for men to engage in weight-management schemes (Hunt et al.,
69 2014). Walking football is a variant of association football and has been targeted at those
70 over the age of 50 years (Reddy et al., 2017). Although based upon the principles of
71 association football, running and slide-tackles are not permitted in walking football
72 (Hampshire FA, 2015). Importantly, such restrictions are likely to decrease the risk of injury
73 and facilitate engagement by individuals who are less mobile. The potential of walking
74 football to engage less active populations is therefore promising. Walking has been shown to
75 bring about improvements in measures of psychological and physiological health (Martin,
76 Rothstein & Larish, 1992; Fox et al., 2007; Murtagh et al., 2015; Okura et al., 2016) and

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77 through the added attraction of a football element it is reasonable to assume older men may
78 maintain engagement in walking football into later life (Nielsen et al., 2014).

79 Although studies have been conducted on the impact of walking football on
80 physiological measures of wellbeing, little detail is provided regarding the demographic of
81 participants (Arnold, Bruce-Low, and Sammut, 2015; Reddy et al., 2017). Furthermore, these
82 studies either involved mixed gender participants or only attracted those aged over 60, thus
83 whether this form of intervention would be suitable and attractive to younger male
84 participants (aged 50) is still unclear. This is an important distinction as findings from
85 Scotland suggest that males in the most deprived areas can only expect to be in good health
86 up to the age of 43.9 years (Scottish Government, 2017). Whether interventions such as
87 walking football could offer a means of improving this however, requires further
88 investigation.

89 Given these issues, this pilot study aimed to examine the feasibility of recruiting
90 males aged 50 years and over to an 8-week walking football programme. We aimed to assess
91 recruitment and retention rates; participant characteristics; data collection engagement pre-
92 and post-programme; and participant experiences. A sample of participants were also
93 contacted one year after the initial 8-week programme to establish whether or not they had
94 continued to be involved in walking football.

Method

96 Male volunteers aged 50 years and over were recruited to a newly-formed walking
97 football group under the Community Trust wing of a Scottish Premiership football club: the
98 sessions were free of charge. Participants were recruited via advertisement on the club website and
99 official social media platforms (Facebook, Twitter) for supporters and followers of the club.
100 Interested individuals were provided with an information sheet detailing the purpose, risks,
101 and benefits associated with the study and were informed that they could withdraw at any

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102 time. To be eligible for participation, participants were required to: 1) be male and 50 years
103 of age or older; and 2) be willing to complete the study in its entirety. Eligible and willing
104 participants were required to complete a physical activity readiness questionnaire (PAR-Q)
105 prior to data collection and informed written consent was obtained from all participants. The
106 study received institutional ethical approval and all procedures conformed to the declaration
107 of Helsinki.

108 **Study Design**

109 This pilot study adopted a randomized-controlled design. Accordingly, participants
110 were either allocated to the intervention group and partook in an 8-week walking football
111 programme or were allocated to a control group and were placed on a waiting list to
112 commence walking football after an 8-week delay. All participants were provided with basic
113 PA and healthy-living guidance (2-page National Health Service leaflet) at baseline. A series
114 of physiological and psychological outcome measures were then obtained during
115 measurement sessions at baseline and again following 8-weeks (both groups).

116 **Walking Football Programme**

117 Walking football sessions were delivered once a week for 8 weeks by community
118 coaching staff employed by the club. Sessions were 60 minutes in duration and took place in
119 the evening on a synthetic pitch at the ground of the participating club. At the end of
120 sessions, participants were invited into the facility for refreshments and the opportunity to
121 socialise with other members.

122 **Baseline Measures**

123 **Demographic characteristics.** Self-reported items at baseline assessed age, ethnic
124 origin, employment status, education level, marital status, and smoking status.

125 **Activities of daily living.** Measures of habitual PA were collected in both groups
126 prior to and following the 8-week intervention or control period. In this regard, participants

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127 were provided with a hip-worn accelerometer (GT3X+, ActiGraph, USA) that was attached
128 to an elasticated waistband. Accelerometers were positioned on participants' right hip on the
129 mid-auxiliary line who were instructed to wear the devices, except during water activities, for
130 7 days. Prior to distribution, accelerometers were initialized using the device software
131 (Actilife v6.13.3, ActiGraph, USA), to collect data at a sampling frequency of 80Hz. Upon
132 the return of the devices, data were downloaded using propriety software into 60 s epoch
133 AGD files for subsequent analyses. Non-wear time was defined as a minimum of 60 minutes
134 of continuous zero counts and days with at least 600 minutes wear time considered valid
135 (Troiano et al., 2008). Participants required at least four valid days of measurement, one of
136 which had to be at the weekend, in order to be included within the analyses. Cut-points
137 previously published by Sasaki et al. (2011) for the vector magnitude were then used to
138 define moderate-vigorous (>2690 cpm) activity. Cut-points previously published by Kozey-
139 Keadle et al. (2011) for the vertical axis (≤ 150 cpm) employing the low frequency extension
140 were used to estimate sedentary time. Finally, only data captured between 06:00 am and
141 10:00 pm were included in the analysis.

142 Outcome Measures

143 All outcome measures were obtained at baseline in both the intervention and control
144 groups with repeat measurements being obtained following the 8-week intervention or
145 control period. Outcome measures collected included: Body mass index (BMI); Blood
146 Pressure (BP); Psychological wellbeing and quality of life, via validated paper-based self-
147 report questionnaires (Table 1); and Cardiorespiratory fitness (CRF). The CRF of
148 participants was assessed using the validated Step Test and Exercise Prescription (STEP)
149 tool, the protocol for which has been published elsewhere (Stuckey, Knight, & Petrella,
150 2012). Established cut-offs for BMI were used to classify participants as overweight (25.0 –
151 29.9 kg.m²) or obese (> 30 kg.m²) (Batsis et al. 2016). Measures of systolic/diastolic BP

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152 were used to categorise participants' BP as normal (80-120/60-80 mmHg); pre-hypertensive
 153 (120-139/80-90 mmHg); stage 1 hypertensive (140-159/90-99 mmHg); and stage 2
 154 hypertensive (>160/>100 mmHg) (Handler, Zhao, and Egan, 2012). Normative values for
 155 maximal oxygen uptake capacity ($\dot{V}O_2^{\max}$) were used to classify participants' CRF as poor
 156 (50-59 years: ≤ 34 ml·kg·min⁻¹; 60-69 years: ≤ 30 ml·kg·min⁻¹), fair (50-59 years: 35-37
 157 ml·kg·min⁻¹; 60-69 years: 31-34 ml·kg·min⁻¹), good (50-59 years: 38-42 ml·kg·min⁻¹; 60-69
 158 years: 35-38 ml·kg·min⁻¹), and excellent (50-59 years: 43-49 ml·kg·min⁻¹; 60-69 years: 39-45
 159 ml·kg·min⁻¹) (Knight, Stuckey, & Petrella, 2014). Crucially, all of these measures were
 160 collected together in one visit onsite at the football club facility, and did not require
 161 participants to travel to a research facility.

162

Table 1. Psychological outcome measures description and evidence of internal consistency using Cronbach α

Variable	Instrument	Scale Description	Cronbach α
Mental wellbeing	Warwick-Edinburgh Mental Wellbeing Scale (Tennant et al., 2007)	Scale assesses mental wellbeing and comprises of 14 positively worded statements with five response categories from “none of the time” to “all of the time”.	0.93
Self-esteem	Self-esteem scale (Rosenberg, 1965)	Measures self-esteem. The 10 items are rated on a 4-point scale ranging from “strongly disagree” to “strongly agree”.	0.84

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Social support via friendship	Social support via friendship subscale from the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988)	Short subscale measures social support obtained via friendship. The 4 items are rated on a 7-point scale from “very strongly disagree” to “very strongly agree”.	0.91
Loneliness	Three-Item Loneliness Scale (Hughes, Waite, Hawkey, & Cacioppo, 2004)	Short scale validated for the measurement of loneliness. The 3 items are rated on a 3-point scale from “hardly ever” to “often”.	0.84
Physical functioning	Physical functioning subscales from the RAND 36-Item Short Form Health Survey	Subscale measures perceptions of physical functioning. The 10 items are rated on a 3-point scale from “yes, limited a lot” to “no, not limited at all”.	0.82
Role limitations due to physical health	Role limitations due to physical health subscales from the RAND 36-Item Short Form Health Survey	Subscale measures perceptions of role limitations due to physical health. The 4 items are rated on a 2-point scale from “yes” to “no”.	0.95

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165 **Semi-structured Interviews**

166 A representative sample of participants from the intervention group were invited to
167 complete a semi-structured interview after the programme (n = 6). A schedule of open-ended
168 questions was used to guide the interview and explore participants' experiences of the
169 walking football programme, such as: reasons for first attending; reasons for continuing to
170 attend; and views on the programme itself. Interviews were conducted in-person (n = 3) or
171 over the phone (n = 3) with researchers experienced in the collection of qualitative data and
172 lasted for an average of 36 minutes (range: 17 – 71 minutes). With participants' permission,
173 interviews were audio recorded. The same participants were also contacted for a brief follow-
174 up interview 1 year after the programme had ended.

175 **Analyses**

176 As the focus of this pilot study was to examine the acceptability and feasibility of
177 recruitment and retention to the walking football programme, this study was not appropriately
178 powered to make statistical inferences regarding changes in outcome measures.
179 Nevertheless, this data has been reported for descriptive purposes, and is presented as mean \pm
180 standard deviation (SD).

181 Qualitative data obtained during semi-structured interviews were analysed using a
182 general inductive approach previously described by Thomas (2006). During the first stage of
183 this process, audio-recordings were transcribed verbatim and transcripts were subsequently
184 double-checked to ensure accuracy. General concepts were outlined through line-by-line
185 analysis of the transcripts, subsequently categories of emerging themes were developed, and
186 quotations were then assigned to relevant categories of higher generality. In order to assess
187 the validity of the aforementioned analyses, credibility checks of the data were undertaken
188 where researchers discussed and confirmed the allocation of raw data units to specific
189 categories through constructive debate.

190

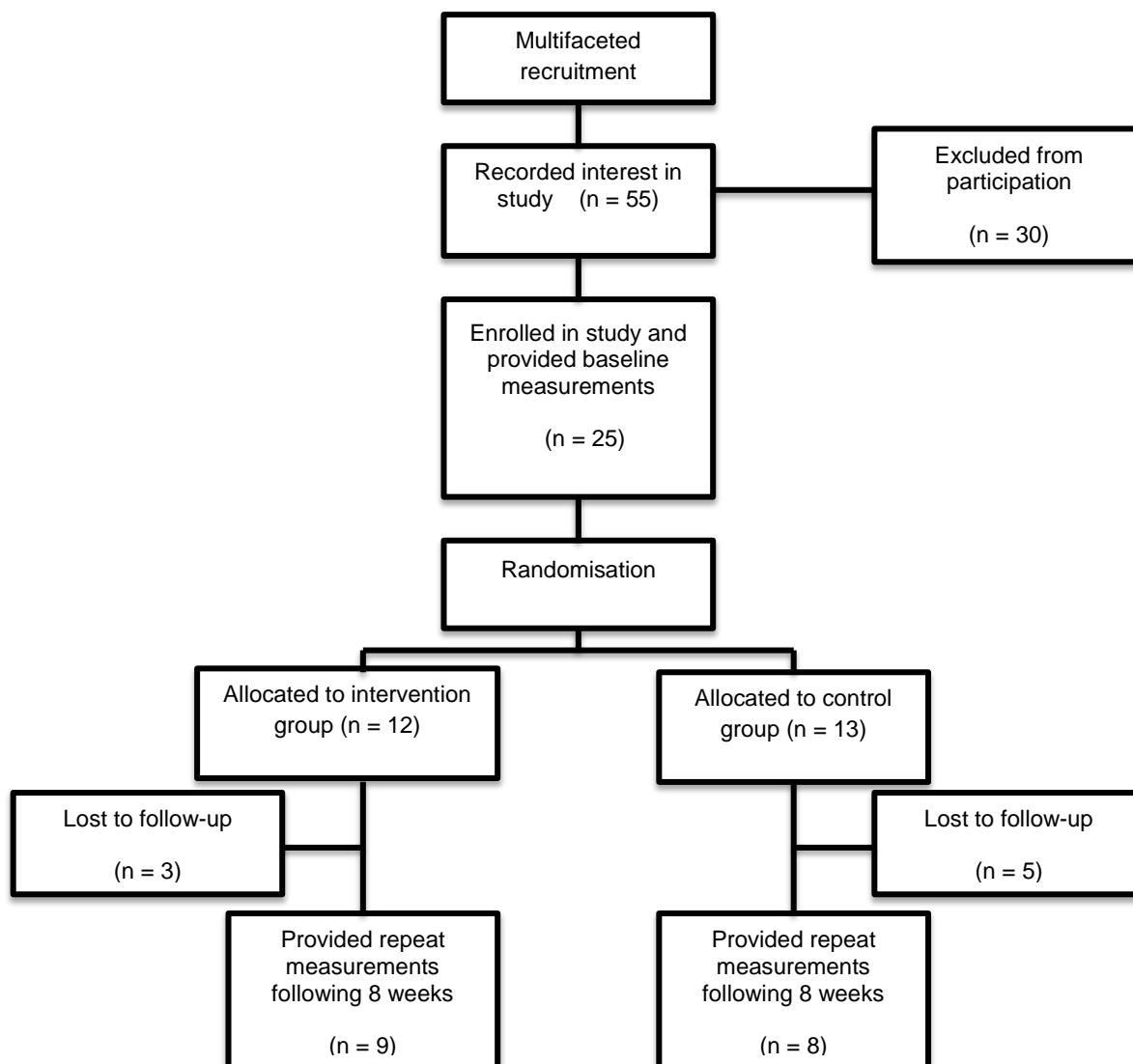
Results**191 Participant Recruitment and Retention**

Figure 1. CONSORT diagram of the flow of participants through the intervention.

192

In total, the recruitment strategy generated interest from 55 males of which 30 did not

193

participate due to various extenuating circumstances. Of the 25 individuals (intervention: n =

194

12; control: n = 13) who provided informed consent and completed baseline measurements,

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195 16 (intervention: n = 9; control: n = 7) completed measurements at the 8-week follow up.
 196 Reasons for drop out included family emergencies (n = 2), work commitments (n = 2), and
 197 personal health complications unrelated to the study (n = 2). No subsequent contact was
 198 made by the remaining participants (n = 2) as to explain their reasons for dropping out. A
 199 relatively high retention rate of 68% was therefore achieved in the present study.

200 Participants were asked to indicate their motivation to take part in walking football.
 201 Ninety per-cent of participants reported that they wanted to ‘improve fitness and health’
 202 whilst 50% stated that the key attraction was to ‘play football again’. A number of
 203 participants had not been involved in organised sport for decades and the opportunity to
 204 engage in some form of football was the main aspect that attracted them to walking football:
 205

206 *I can't have any physical contact on my left leg. I knew that I couldn't play either*
 207 *five-a-side football or 11-side-football because of the physical contact aspect of it. So*
 208 *walking football was an opportunity for me to still play the game that I really enjoy*
 209 *without the physical contact. (Participant 1)*

210 **Participant Characteristics**

Table 2. Baseline characteristics of participants allocated to the intervention and control groups

	Intervention group (n = 12)	Control group (n = 13)	Total sample (n = 25)
Age (years)	56 (4.0)	60 (6.0)	58 (6.0)
Ethnic origin			
White (British, Scottish, Irish, or other)	12 (100.0)	12 (92.0)	24 (96.0)
Other	0 (0)	1 (8.0)	1 (4.0)

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Scottish index of multiple deprivation (% living in quintiles)

1 (most deprived)	4 (33.3)	2 (15.4)	6 (24)
2	3 (25.0)	3 (23.1)	6 (24)
3	0 (0)	2 (15.4)	2 (8)
4	2 (16.6)	3 (23.1)	5 (20)
5	3 (25)	2 (15.4)	5 (20)
Missing	0 (0)	1 (7.7)	1 (4)

Employment status

Paid work	6 (50.0)	11 (84.6)	17 (68.0)
Not working *	2 (16.6)	0 (0)	2 (8.0)
Retired	4 (33.3)	2 (15.4)	6 (24.0)

Education

No qualifications	1 (8.3)	0 (0)	1 (4.0)
Standard grades or Scottish Highers	4 (33.3)	4 (30.8)	8 (32.0)
Vocational or HNC or HND	4 (33.3)	4 (30.8)	8 (32.0)
University education	1 (8.3)	3 (23.1)	4 (16.0)
Missing	2 (16.6)	2 (15.4)	4 (16.0)

Marital status

Married	10 (83.3)	9 (69.2)	19 (76.0)
Living with partner	1 (8.3)	2 (15.4)	3 (12.0)
Other (single, divorced, or widowed)	1 (8.3)	2 (15.4)	3 (12.0)

Smoking status

Smoker	2 (16.6)	1 (7.7)	3 (12.0)
Non-smoker	6 (50.0)	7 (53.8)	13 (52.0)

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Missing	4 (33.3)	5 (38.5)	9 (36.0)
BMI			
Overweight	4 (33.3)	6 (46.2)	10 (40.0)
Obese	8 (66.7)	7 (53.8)	15 (60.0)
BP			
Pre-hypertensive	2 (16.7)	0 (0.0)	2 (8.0)
Stage 1 hypertension	2 (16.7)	6 (46.2)	9 (36.0)
Stage 2 hypertension	8 (66.7)	7 (53.8)	14 (56.0)
CRF			
Poor	2 (16.7)	5 (38.5)	7 (28.0)
Fair	5 (41.7)	4 (30.8)	9 (36.0)
Good	3 (25.0)	4 (30.8)	7 (28.0)
Excellent	2 (16.7)	0 (0.0)	2 (8.0)
Physical activity and sedentary behaviour			
Physically inactive (< 150 min MVPA/week)	3 (25.0)	1 (9.1)	4 (17.4)
Physically active (\geq 150 min MVPA/week)	9 (75.0)	10 (90.9)	19 (82.6)
Mean daily sedentary time (hours)	9.8 (1.9)	9.0 (1.0)	9.4 (1.5)
Self-reported psychological wellbeing and quality of life			
Self-esteem	21 (3)	25 (3)	23 (4)
Social support via friendship	5 (1)	6 (1)	5 (1)
Loneliness	4 (2)	3 (1)	4 (2)
Mental wellbeing	48 (7)	55 (6)	52 (8)
Physical functioning	88 (18)	92 (10)	90 (14)
Role limitations due to physical health	85 (34)	94 (21)	89 (28)

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Data are presented as mean (SD) or number (%). HNC = Higher National Certificate. HND = Higher National Diploma. BMI = body-mass index. BP = blood pressure. CRF = cardiorespiratory fitness. MVPA = moderate to vigorous physical activity. * Due to long-term sickness or disability.

211

212 For baseline measures of habitual PA, instances of device malfunction (n = 2)
213 accounted for slight data attrition. As all participants satisfied the specified wear time
214 criteria, accelerometer data were available for 12 and 11 participants in the intervention and
215 control groups, respectively. When viewing the entire sample, our data suggest that whilst
216 the majority of participants (82.6 %) exceeded current PA guidelines, participants also
217 demonstrated high levels of sedentary behaviour before they engaged with this programme.
218 Based upon BMI, all participants in the present study were classified as being either
219 overweight (n = 10) or obese (n = 15). Additionally, baseline measurements highlighted all
220 participants to exhibit a BP outside normal ranges. Specifically, participants were
221 categorized as pre-hypertensive (n = 2), stage 1 hypertensive (n = 8), and stage 2
222 hypertensive (n = 15). Finally, levels of CRF were found to be varied amongst participants at
223 baseline with participants falling under the categories of *poor* (n = 7), *fair* (n = 9), *good* (n =
224 7), and *excellent* (n = 2).

225 Intervention Feasibility and Acceptability

226 Of the nine participants in the intervention group who provided post-measurements,
227 four had attended every walking football session, three had only missed one session, and two
228 participants had missed two sessions. Adherence to the walking football programme was
229 therefore found to be excellent with a mean attendance of 90% (range: 75 – 100%). No
230 adverse events were encountered by participants during the course of the walking football
231 programme. Of the seven participants in the control group who provided post-measurements,

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232 all commenced the walking football programme at the end of the 8-week control period,
 233 further highlighting walking football to be an attractive form of PA for the studied cohort.

234 **Changes in outcome measures**

235 Outcome measures obtained from participants at baseline and following the 8-week
 236 intervention or control period are presented in Table 3.

Table 3. Changes from baseline in outcome measures

	Intervention group (n = 9)		Control group (n = 7)	
	Baseline	Post-measure	Baseline	Post-measure
Body mass (kg)	100.6 (14.0)	101.1 (14.6)	98.0 (17.4)	97.3 (16.9)
BMI (kg·m ²)	33.4 (6.3)	33.7 (6.5)	32.1 (6.2)	32.0 (6.3)
Systolic BP (mmHg)	158 (20)	147 (17)	160 (14)	151 (11)
Diastolic BP (mmHg)	89 (13)	84 (11)	93 (6)	88 (6)
p $\dot{V}O_{2max}$ (ml·kg·min ⁻¹)	35.52 (5.56)	36.79 (4.31)	33.51 (4.36)	35.47 (4.60)
Mean daily MVPA (min)	50 (32)	52 (29)	47 (20)	47 (20)
Self-esteem	21.11 (3.37)	19.89 (4.48)	25.38 (3.46)	25.88 (3.98)
Social support via friendship	5.11 (1.02)	5.33 (1.38)	5.25 (1.66)	5.88 (0.60)

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Loneliness	4.56 (1.94)	4.78 (1.92)	3.50 (1.41)	3.38 (1.06)
Mental wellbeing	46.22 (7.46)	46.89 (8.37)	54.50 (6.72)	56.63 (7.96)
Physical functioning	85.00 (19.69)	82.22 (17.52)	90.63 (11.48)	91.88 (8.94)
Role limitations due to physical health	88.89 (33.33)	77.78 (44.10)	100.00 (0.00)	100.00 (0.00)

Data presented as mean (SD). BMI = body mass index. BP = blood pressure. $\dot{V}O_{2max}$ = predicted maximal oxygen uptake. MVPA = moderate-vigorous physical activity.

237

238 **Qualitative data**

239 Qualitative data aimed to investigate the experiences of those within the walking
 240 football programme; their personal perspective of the impact of this programme on their
 241 health and wellbeing; and why they remained involved. A number of thematic concepts were
 242 identified during qualitative analyses and these were reduced to 3 themes which can be
 243 viewed in Table 4.

Table 4. Qualitative Research Results

Theme	Example quotations
	<p>(Participant 1) <i>It's good to meet some people that you don't know socially because one of the things you miss when you're not working anymore is you miss the social aspect of speaking to people, that's an important thing, and it can't be underestimated as you're getting older. The fact that you meet up with people regularly for a common purpose is really good.</i></p>

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1. Social Interaction (Participant 2) *Going back to the stadium for a cup of tea or a cup of coffee and having a chat. And it's people my own age, which is great. [But walking football is] an awful lot of fun. The group of guys, I mean, not become friends for life, but we're getting close to it, I mean, we bonded.*

(Participant 3) *But I think that is the biggest bonus of it, when you meet people. You wouldn't imagine at my age, and everybody else's age you would meet new friends and I have already got two people that I have went and met outside of football for just a bite to eat, I keep in regular contact, so I would say the bonuses of walking football are social.*

2. Group motivation to improve health (Participant 6) *Personal health issues, we've always talked about what was wrong with us and what we're doing to get ourselves fitter. I always felt that these things come and go, you play for your team, you win, that's it. But what I'm finding here is people have a common goal to get well.*

(Participant 3) *I have actually cut my cigarettes by 50 percent in less than 5 weeks. I'm not saying that you go there and a new way to stop smoking is play Walking Football, but I tend to find when you are doing things you have not got the time to smoke, and then when you come out you're not bothered about having a cigarette.*

(Participant 2) *Yes, I admit that I'm overweight and I'm probably a tad lazy once I come home, but the chance of doing this on a Thursday has*

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given me a spark to the week.

(Participant 6) *It felt like I was back 16 again, playing. I felt that kind of feeling when everything's going right.*

3. New lease

of life (Participant 2) *It's something to look forward to, it's not a chore, it's something that I really look forward to.*

(Participant 3) *I started this, my own wife said she actually saw me get a little 'lift', I looked different. But I found that it gave me something to look forward to.*

244

245

Discussion

246

The walking football programme attracted men from all socioeconomic groups.

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Participants emanated from varying backgrounds regarding employment status, education,

248

and marital status; however, only one participant originated from an ethnic minority group.

249

Such findings highlight the potential of walking football to become a feasible option by

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which mid to older aged individuals, irrespective of their demographic characteristics, can

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participate in structured PA aimed at enhancing health and wellbeing.

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Given that those over the age of 50 represent the most sedentary segment of the adult

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population and are consequently amongst those most heavily affected by chronic disease, our

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findings are promising in that walking football appears to be a feasible means by which older

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individuals, who were previously sedentary (Tremblay et al, 2017) can regularly participate

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in structured PA. In addition to proving effective at attracting older males who were

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257 sedentary and presented with an array of comorbidities, adherence to the walking football
258 programme was high with attendance rates of 90%. Interestingly, attendance rates in the
259 current investigation are higher than the 58 – 77% typically observed during exercise
260 interventions for older people and are likely reflective of the intervention content (Picorelli,
261 Pereira, Pereira, Felício, & Sherrington, 2014). In line with Neilsen et al. (2014) who
262 highlighted the enjoyment of the game and the social interactions it created to promote
263 continued participation in football-related interventions, all interviewed participants in the
264 present study stated their enjoyment at playing football again, with the social aspects of the
265 walking football sessions emerging as a key theme. Whilst walking groups are popular with
266 older adults, standard walking groups tend not to be gender-specific, or are targeted to
267 women only, and this is reflected in the low numbers of older men who engage with standard
268 walking interventions (Kassavou, Turner & French, 2013). For example, Paths for All,
269 Scotland's Walking Charity, noted that between 2016 and 2017 vastly more females (77%)
270 attended their standard health walks than males (23%) (Paths for All, 2017). In this pilot
271 study 50% of participants noted their main motivation to take part in walking football was to
272 'play football again', and 100% of interviewees noted affiliation to a professional football
273 club as a key attraction. Crucially, standard walking groups had not attracted these
274 individuals, but they were drawn to this walking programme with a football link, and
275 particularly a link to a professional football club. Nevertheless, whilst the pull of walking
276 football appears to be supportive of high attendance rates, future research is needed to truly
277 examine the adherence to walking football over longer periods with a larger sample.

278 All but two of the participants were hypertensive, and whilst the majority of
279 participants may have met current PA guidelines, participants appeared sedentary as
280 evidenced by a mean daily sedentary time of ~9.4 hours. Regular PA has been shown to be
281 beneficial for reducing mortality in hypertensive individuals (Rossi, Dikareva, Bacon, &

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282 Daskalopoulou, 2012). The high levels of sedentary time reported from the sample are
283 notable given the growing body of evidence showing sedentary behaviour to be a risk factor
284 for chronic disease and the development of cardiometabolic syndrome (Thorp, Owen,
285 Neuhaus & Dunstan, 2011). All participants were classed as overweight or obese based on
286 their BMI. Ryan (2010) has argued that a physically active lifestyle should be encouraged in
287 overweight and obese individuals to reduce the risk of cardiovascular events as they age.
288 Thus, a notable result is that this programme was able to attract hypertensive, sedentary,
289 overweight and obese men over 50 to a regular PA programme, with 90% adherence over 8
290 weeks, and this was maintained beyond 8 weeks in some cases as noted below.

291 In addition to the high attendance rates observed, participants allocated to the
292 intervention group were able to safely complete the programme without experiencing any
293 adverse events, thus highlighting the appropriateness of walking football for older
294 populations. Furthermore, the measures adopted in the current investigation were well
295 tolerated by participants as evidenced by the number of individuals providing repeat
296 measurements at both baseline and following the 8-week intervention or control period. The
297 absence of negative feedback concerning outcome measurements may also support the
298 acceptability of the measurements used within such populations. This is an important finding
299 which substantiates the choice of measures used within this study, providing confidence that
300 in future studies, participants are likely to adhere to the study protocol.

301 Qualitative findings indicated that a major attraction to this PA programme, and a
302 reason for sustained engagement, was the opportunity for social interaction with similar
303 people. Theme 1 shows that participants appreciated the optional social event (refreshments
304 in the facility) after every session with men of a similar age. The participants suggested that
305 this was something missing from their lives prior to engagement in walking football, and it
306 was a reason why they maintained their involvement. These findings also show that though

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307 this group of older males would traditionally be categorised as a hard-to-reach group for
308 healthy activity engagement, it is worth aligning this with the argument of Baker (2012) who
309 suggests these hard-to-reach groups of older males are better categorised as ‘unreached’, in
310 that if they are provided with the right environment they will become motivated to improve
311 their health. Themes 2 and 3 showed that there was a distinct group motivation and
312 enthusiasm to improve health throughout, and beyond, this programme. All participants
313 continued with walking football after the initial 8-week research period.

314 The 6 interviewees were contacted one year after the programme to investigate their
315 exercise habits beyond this intervention. After the initial 8-week programme, walking
316 football was still offered at the same time and place in the professional football club for 1
317 year. When the interviewed participants were contacted 1 year later it was noted that all (n =
318 6) were still engaged in walking football. Some participants therefore showed a willingness to
319 engage in this activity long-term, and they reported similar reasons for their maintained
320 engagement 1 year later as were originally noted in Table 3. This suggests that walking
321 football could be a particularly cost-effective intervention. Initial costs are needed to establish
322 the programme in the community and recruit individuals, but beyond this the social links and
323 opportunity to be part of a ‘football team’ means that many men will maintain engagement
324 even after the intervention has been removed. This shows that walking football may well be a
325 way to attract and retain a traditionally hard-to-reach group of overweight, sedentary,
326 hypertensive over 50s males in long-term PA.

327 As this was a pilot feasibility study, the primary limitations of the current
328 investigation reside in our small sample size and short duration of the intervention. Though
329 pre and post measures were collected from all participants to ascertain feasibility of the
330 chosen design, our small sample size meant that statistical tests lacked adequate power to
331 detect differences in outcome measurements. A descriptive assessment may suggest that BMI

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332 remained unchanged in both groups whilst showing trends regarding small improvements in
333 MVPA and blood pressure as a result of participating in walking football. Nevertheless, the
334 qualitative data suggested a positive shift in participants' outlook and wellbeing, and the
335 recruitment and retention data demonstrates the potential for walking football to attract and
336 retain this target group in PA long term, with at least half of participants maintaining
337 engagement for at least one year. This suggests further research is needed. To gain a
338 comprehensive understanding of the impact of walking football on the health of individuals
339 over the age of 50 years, future interventions should incorporate larger sample sizes whilst
340 heeding the attrition rates reported here. Suitably powered evidence on the efficacy of
341 walking football is highly warranted, given the potentially wide-reaching attraction and cost-
342 effectiveness of this form of PA.

343 **Conclusion**

344 This pilot study aimed to examine the feasibility of recruiting and retaining males
345 aged 50 years and over to an 8-week walking football programme and retaining them for
346 data-collection purposes. The programme recruited participants from a variety of
347 demographics, representing all areas of deprivation, including those identified as the two
348 most deprived areas. All participants were classified as being either overweight or obese, all
349 had BPs outside normal ranges, all but 2 were classed as hypertensive, and when mean daily
350 sedentary time was measured participants were classified as sedentary. Based on this, the
351 mass appeal of walking football is evident as it attracted a wide range of demographics, but
352 crucially was able to attract and retain those at risk of developing chronic disease because of
353 being overweight or obese, sedentary, and/or hypertensive and physically inactive. A
354 relatively high retention rate of 68% was achieved for post-measures in the present study.
355 Participants noted that the data collection process was made easier by measures being
356 collected onsite at the football club rather than in a distant research facility. Adherence to the

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357 walking football programme was 90%: higher than the 58 – 77% typically observed during
358 exercise interventions for older people, and each of the participants interviewed from the
359 intervention group (n = 6) maintained engagement with walking football for at least one year
360 after the intervention was removed. Walking football therefore presents itself as a feasible
361 method of recruiting and retaining males aged 50 years and over to a PA programme, and for
362 the collection of the suggested pre and post outcome measures, though a level of attrition is to
363 be expected. Future research should incorporate larger sample sizes to accommodate for
364 expected attrition levels and to produce suitably powered data to better understand the
365 efficacy of walking football for improving the health of males over the age of 50 years.

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