MANUSCRIPT

Running title: Differences in walking football initiation and maintenance influences across respondent characteristics: a cross-sectional survey in 50-75 year -old adults

Abstract

Despite health benefits gained from physical activity and sport participation, older adults are less likely to be active. This study investigates what influences 50–75-year-olds (N=439) to initiate and maintain walking football, across gender, socioeconomic status, number of health conditions and physical activity level. It also considers relationships between participant characteristics and influences, and intentions to play after a forced break (COVID-19). Results of a UK online cross-sectional survey found those with two or more health conditions rated social influences significantly higher in initiation and maintenance, than participants with no health conditions. Multiple regression analysis found a positive walking football culture and perceived use of maintenance resources contributed significantly to intentions to return to play after COVID-19 restrictions eased. Practitioners should consider providing opportunities for social connection, foster a positive walking football culture, and encourage players to utilise maintenance resources (e.g., scheduling sessions) in older adult walking football sessions.

Keywords: behaviour change, soccer, physical activity, survey research, older adults

Introduction

Research has shown that physical activity (PA) improves physiological and psychological health markers in older adults (Chapman et al., 2013; Rezende et al., 2014), however reports have suggested that older adults in the UK are more likely to lead inactive lives compared with the general population (Sport England, 2018). Furthermore, research has found that older adults are less likely to maintain PA in the long-term (Kendrick et al., 2018). Sport participation, as a particular form of PA, offers additional psychological and physical benefits in older age. These benefits include less total sedentary behaviour, quicker reaction times, and better self-reported health related quality of life than those who do not play sport(Gayman et al., 2017; Pesce & Audiffren, 2011). Despite this, research has reported a number of barriers to sport participation in older age, including a lack of accessible sport programmes (including inappropriate facilities or lack of senior competitions) (Jenkin et al., 2018). Furthermore, a low socio-economic status (SES), identifying as a woman, and poor health have been reported widely as barriers to PA and sport participation (Dhalwani et al., 2016; Fox et al., 2011; Hirvensalo & Lintunen, 2011; Jenkin et al., 2018) . In order to increase numbers of older adults who benefit from sport participation, it is important to identify determinants and factors which promote long-term participation. As a result, sport programmes can be tailored and optimised to promote and encourage physical activity behaviour among a diverse range of older adult populations.

Walking football (soccer) is a form of adapted sport becoming popular in the UK, where football rules are adapted for players to play the game at a walking pace (Lloyd, 2019). Researchers have suggested adapted sport as a form of sport participation which may mitigate some barriers expressed by older adults, for example health status (Jenkin et al., 2018). Studies investigating the effectiveness of walking football on older adult health have shown

promising findings relating to improving physiological health, and the sport being a sustainable form of activity for older adults (McEwan et al., 2019; Reddy et al., 2017). Qualitative methods that have been used to explore the experiences of older adults who participated in a walking football intervention found that perceived benefits included the enjoyment of social interactions and walking football (Reddy et al., 2017). However, these studies tended to investigate the overall impact of walking football and the benefits associated with playing the sport. Research within the field of behaviour change has suggested that differences to physiological and mental health are seen after sustaining PA longer than six months (Almeida et al., 2014; Laitakari et al., 1996; Liu-Ambrose, 2010) and further differences are seen between those who are starting (initiating) and maintaining a behaviour long term (Rothman, 2000; van Stralen et al., 2009, 2010). It is therefore important to investigate the influences involved in different phases of behaviour change, so relevant approaches to helping older adults sustain walking football play long term can be employed.

Recent qualitative research into walking football has furthered understanding of psychosocial and behavioural aspects of initiating and maintaining participation among older adults (Cholerton et al., 2020, 2021). This research found multiple individual, social and environmental influences present across initiation and maintenance (e.g., values relating to health and sport, team connections). Further evidence suggests that some influences also differ across phases, for example walking football culture (e.g. the values a club and sporting body holds) being influential at maintenance of walking football, but not initiation. There is also research evidence that influences differ across varying participant characteristics, such as SES and gender (e.g., different forms of walking football awareness across varying SES). Previous research has also found differing levels of PA and sport participation among older adults with varying characteristics, for example across gender and SES (Kamphuis et al.,

2009; Murtagh et al., 2015) as well as varying experiences of PA and sport participation among participants with different numbers of health conditions and weekly PA levels (Dhalwani et al., 2016; Jenkin et al., 2017; Stenner et al., 2020). As it is evident that varying PA and sport experiences are seen across a number of participant characteristics, it is important to understand whether there are any differences in influences relating to walking football initiation and maintenance, across these characteristics. This knowledge would allow clubs and sporting bodies to make informed and tailored recommendations relating to the promotion of the game and session delivery, with the aim of aiding sustained participation in the sport for varying audiences.

Despite the known benefits of long-term PA and sport participation, research has suggested that older people have reduced chances of maintaining PA. Kendrick and colleagues (2018) found only 48% of participants achieved the stated PA target (150 minutes) in the most successful exercise programme group assessed, 24-months after the exercise programme had ended. The Coronavirus (COVID-19) pandemic also had a direct effect on walking football clubs, due to strict health and safety restrictions imposed (The FA, 2020). As breaks in play due to illness, injury and holidays are discussed throughout previous walking football qualitative research (Cholerton et al., 2020, 2021) and relapse prevention becoming a key aspect of PA maintenance strategies (Sherwood et al., 2008), understanding key influences which are more likely to aid players to return to playing walking football (following enforced cessation) is important to investigate.

The aims of the present study were to: (a) to investigate differences in influences of walking football initiation across SES, gender, health conditions and weekly PA, b) to investigate differences in influences of walking football maintenance across SES, gender, health

conditions and weekly PA, and c) to examine which characteristics, initiation and maintenance influences contribute most to the intention to continue playing walking football after COVID-19 restrictions ease.

Methods

Respondents and recruitment

The reporting of the study methods adheres to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines (Eysenbach, 2004). Respondents were 439 older adults (392 male, 47 female) aged between 50-75 years. They were recruited from UK walking football clubs and purposive sampling was applied as part of the process. Recruitment was conducted solely online due to the COVID-19 pandemic, using social media, and contacting clubs via email, to advertise the survey to their players. Further snowball sampling was used, with players being asked at the end of the survey to advertise to other players. To complete the survey, respondents were required to have at least six months' experience playing walking football, to ensure respondents satisfied the minimum term of maintenance according to previous literature (Lally et al., 2010; van Stralen et al., 2009). Due to COVID-19 restrictions coming into effect on 23rd March 2020 in the UK, respondents were therefore recruited if they had started playing walking football on or before the 23rd of September 2019. The respondents were also required to be of UK residence, so postcodes for SES data could be recorded. Respondents were also asked to provide information around their lifetime sport experience (types of sport played, years played and days per week played) and how they became aware of walking football to gather further information regarding their awareness of walking football.

Sample size

G*Power 3 was used to calculate a sample size for the cross-sectional survey (Faul et al., 2007), based on a medium effect size ($f^2 = 0.15$), estimated power of 0.90 and alpha level of 0.05. Sufficient sample sizes calculated were N=116 for study aims one and two (Hotelling's T2 and MANOVA analyses), and N=89 for aim three (multiple regression analysis), however the research team aimed to recruit at least 300 participants, similar to papers with similar purposes (Ashford et al., 1993; Ashton et al., 2017; Ryu et al., 2018), who used sample sizes of 339, 282, and 153 participants, respectively. A sample size target of 300 was chosen in order to account for dropout and to produce scalable findings.

Survey development

An empirically grounded survey was designed to achieve the study aims. The findings from the previous qualitative studies conducted by the research team (Cholerton et al., 2020, 2021) directly informed the themes and content of the survey. Due to the lack of existing instruments to assess walking football participation, this approach was employed so the new survey was context-specific to walking football, and key concepts from the qualitative phase could be suitably measured within a larger sample. This approach is consistent with similar research in the field of sport and exercise, and health psychology (Gould et al., 2002; Walker et al., 2021; Wallace et al., 2012).

The survey development involved three rounds. The first round of development involved forming survey subscales, using the lower order themes contained in each higher order theme from the research team's previous studies (Cholerton et al., 2020, 2021). The second stage of survey development involved adapting previous questions from suitable existing surveys within the PA literature, or developing new questions, observing similar language used in previous questionnaires and surveys. This follows similar research which has used

combinations of previously published surveys and developed questions to answer the research aims (Ashford et al., 1993; Crowther et al., 2017; Hwang et al., 2020; Rice et al., 2019). The third round of survey development involved formatting questions within the online survey software Qualtrics (Provo, UT, 2020). Eighteen pages or web screens of items were shown to participants. The survey was developed so respondents were able to review or change their answers, via a back button on the survey.

Measures

Independent variables

Sixty-six items in total were used in the survey. Two items relating to the respondent's age and length of walking football play were used to ensure respondents were screened correctly. Four items measured respondent characteristics. Gender (male, female, prefer not to say) was collected, and SES was measured via Indices of Multiple Deprivation (Ministry of Housing Communities and Local Government, 2019; Northern Ireland Statistical Research Agency, 2017; Scottish Government, 2016; StatsWales, 2019). Information on number of health conditions was reported using Potter and colleagues' (2017) long term conditions questionnaire. Weekly PA level measured by a single item questionnaire, developed by Milton and colleagues (Milton et al., 2011). A further three items measured respondents' change in PA since COVID-19 restrictions were implemented, lifelong sport experience, and how respondents became aware of walking football, measured by defined categorical options, as well as an open-ended response for 'Other'.

Dependent variables

Eighteen items measured influences on walking football initiation and 35 items were used to measure influences on walking football maintenance. The items were adapted from a range of

surveys, or developed by the researcher based on quotes from the research team's previous qualitative research (Anderson, 2004; Anderson et al., 2016; Barrett-Lennard, 1962; Cholerton et al., 2020; 2021; Devereaux Melillo et al., 1997; Estabrooks & Carron, 2000; Jowett & Ntoumanis, 2004; Markland & Tobin, 2004; Myers et al., 2006; Newton et al., 2007; Pelletier et al., 2013). For each statement, respondents were expected to answer each of the items on a 5-point Likert scale, ranging from 'not true of me at all' to 'extremely true of me'. Examples of statements include 'The location of the walking football club was suitable for me' and 'I have good friends in this walking football group'. Six items formed the intention to continue section of the survey. Two items were developed by the researcher to ascertain whether clubs had resumed at the time of answering the survey, and if the respondent had returned to walking football. A further two items then measured the intention to play once walking football clubs had reopened, and wording was adapted from a previous survey administered to older adults (Li et al., 2019).

Procedure

Following university ethics approval for the study (Ethics ID: ER25811320), a pilot survey was administered to walking football players in August 2020. The pilot survey was conducted with 12 respondents (10 male, 2 female). A further survey section containing questions related to the survey process were asked at the piloting stage. The median completion time for the pilot was 17 minutes. Minor changes were made to the survey after piloting, such as formatting some questions for clarification. This included emboldening text to clarify questions, for example "**In the past week**, on how many days have you done a total of 30 minutes or more of physical activity, which was enough to raise your breathing rate?". When asked if the time to complete the survey was acceptable, all respondent selected 'yes'.

The main survey data collection took place online between September and November 2020. The web link to the survey contained a welcome page with a participation information sheet and consent form for participants to provide informed consent, and the survey was in an open format, meaning that it was not password protected. After completing the survey, respondents were shown a debrief form. Upon completion of the study, respondents were offered the choice to enter a raffle to win one of two gift vouchers, with research suggesting that incentives can aid response rates (Singer & Ye, 2013). The process adhered to university guidelines (Sheffield Hallam University, 2015).

Data analysis

Before data analysis took place, data files were cleaned to identify missing, invalid or insufficient data (Fritchoff Davis, 2012). Duplicated survey responses, identified through IP address and postcode, were removed before analysis. A criterion for including partially completed surveys was devised by the research team prior to analysing the data, to ensure sufficient completion for each section was included, as composite scores were needed for coding and data analysis. Any survey response which did not meet 67% completion (participants not completing the initiation questionnaire) was discounted, due to data insufficiency in relation to answering the study aims. Out of 514 returned surveys, 75 survey responses were excluded from analysis due to insufficient response completion, duplication of respondents, or not meeting the inclusion criteria. Four hundred and thirty nine responses were used to analyse descriptive statistics and initiation analysis. Two responses were discounted from the maintenance analysis and a further four responses were discounted from the intention to return to play analysis due to insufficient completion. Gender was assigned (male or female), and SES was determined via converting postcodes into IMD (Index of Multiple Deprivation) rankings, which are used in the UK to measure relative deprivation in

small areas (Department for Communities and Local Government, 2015; Northern Ireland Statistical Research Agency, 2017; Scottish Government, 2020; StatsWales, 2019). These ranks range from one to 32844, one being the most deprived rank and 32844 being the least deprived rank. These ranks were then divided into two groups, 'high' and 'low' SES. Number of health conditions were calculated and split into three groups, representing those with no health conditions, those with one health condition, and those with two or more health conditions, the latter group defined as 'multimorbidity'(Barnett et al., 2012; Dhalwani et al., 2016). Weekly PA was split into three groups, representing those who did PA on 0-1 days, those who did PA on 2-4 days, and those who did PA on 5+ days (Sport England, 2020a). For the intention to return to play analysis, the responses for perceived change in PA over COVID-19 restrictions were split into three groups, 'more', 'same' or 'less', in line with the Sport England report on COVID-19 behaviours (Sport England, 2020b).

Cronbach's alpha tests were run for each factor, in order to assess how much the items on the scales devised were measuring the same underlying construct (Field, 2013). Any scales with a reliability score (Cronbach's alpha) over 0.6 was considered acceptable, as when measuring psychological constructs in exploratory studies, scores below 0.7 can be expected due to the diversity of the constructs measured (Field, 2013).

For the first and second research aims (differences in initation and maintenance influences between participant characteristics), differences according to gender and SES were examined using Hotelling's T^2 test, and Bonferroni-adjusted alpha levels were used to correct for the increase in Type I errors from the multiple individual tests (Field, 2013). Differences according to health conditions and weekly PA levels were investigated using a one-way multivariate analysis of variance. Where significant results occurred, post hoc tests

(univariate ANOVAs and Tukey's Honest Significant Difference) were run. For the third research aim (i.e., which variables contributed most to the intention to continue play), multiple regression analysis was performed and 13 independent variables relating to the characteristics and influences were examined, with the mean for the two intention to play items as the dependent variable (Field, 2013). Effect sizes for significant results were interpreted according to Cohen (1988), using Cohen's d for Hotelling's T and adjusted R^2 values for multiple regression.

Results

Table 1 displays the characteristics of the respondents. The sample consisted of 439 older adults who had played walking football for over six months where the majority of respondents (89.3%) were male compared to female respondents (10.7%). The majority of respondents were categorised as being from high SES areas (67.7%) and a third of respondents were from low SES areas (32.3%). Most respondents were from England (91.3%). The number of health conditions varied; a third of respondents respondents reported one health condition (34.4%) and 22.6 percent of respondents reported two or more health conditions, with 43.1 percent of respondents reporting no health conditions. Weekly PA levels also varied, with 46 respondents (10.5%) reporting low active levels (30+ minutes on 0-1 days per week), 235 participants (53.5%) reporting 2-4 days per week of PA, and 158 participants (36%) reporting five or more days a week of activity. Regarding perceived change following the COVID-19 UK restrictions, the majority of respondents recorded they had taken part in 'Less' PA (41.5%), 28 percent of respondents recorded the 'same', and 30.4 percent of respondents recorded 'more' PA. Regarding lifetime sport experience, the respondents' mean days per week playing sport tended to decrease over the lifespan. When

respondents were asked about how they became aware of walking football, being made aware via a friend was the most common amongst the overall sample of respondents (33.7%).

[Insert Table 1 here]

Survey internal consistency

For both initiation and maintenance sections of the survey, subscales were deemed acceptable for the purposes of this study (Field, 2013). Table two displays individual Cronbach's Alpha scores for each subscale.

[Insert Table 2 here]

Main effects of gender, SES, number of health conditions and weekly PA level on walking football initiation influences

Descriptive statistics for differences in initiation influences on walking football play for gender, SES, health conditions and weekly PA are shown below (Table 3 and 4). Means, standard deviations and F scores are shown for each dependent variable. Male players rated social influences higher than female players, whereas female players rated psychological influences and walking football environment higher. The differences between gender on the combined dependent variables for initiation (psychological influences, social interactions, and walking football environment) was not statistically significant ($F(3, 435) = 1.94$, $p = .12$, Wilks' $\Lambda = .99$; partial $\eta 2 = .01$). When assessing SES, low SES respondents reported psychological influences, social interactions and walking football environment as being more influential on walking football initiation than high SES counterparts. The differences between high and low SES respondents on the combined dependent variables was not statistically significant ($F(3, 435) = 1.10$, $p = .35$, Wilks' $\Lambda = .99$; partial $\eta 2 = .01$).

[Insert Table 3 here]

[Insert Table 4 here]

Regarding weekly PA, those who participated in weekly PA for 5 or more days per week rated the highest on psychological influences and walking football environment, and those engaging in PA for 2-4 days per week rated highest on social interactions. The differences between the level of weekly PA on the combined dependent variables was not statistically significant ($F(6, 868) = 1.09$, $p = .37$, Wilks' $\Lambda = .99$; partial $\eta 2 = .01$). When assessing the number of health conditions, those with no health conditions rated all initiation influences lower than those with one health condition, or two or more health conditions. The differences between the number of health conditions on the combined dependent variables was statistically significant ($F(6, 868) = 2.56$, $p = .018$; Wilks' $\Lambda = .97$; partial $\eta 2 = .02$; $d = .21$). Follow-up univariate ANOVAs showed that social interactions were statistically significantly different between respondents with different numbers of health conditions ($F= 4.882$, $p = .008$), using a Bonferroni adjusted α level of .017. Tukey post-hoc tests found that for the influence of social interactions, respondents with two or more health conditions had statistically significantly higher mean scores than respondents with no health conditions ($p = .005$). No significant differences were observed for either psychological influences or walking football environment.

[insert Figure 1 here]

Main effects of gender, SES, number of health conditions and weekly PA level on walking football maintenance influences

Descriptive statistics for differences in maintenance influences on walking football play for gender, SES, health conditions and weekly PA are shown below. Means, standard deviations and F scores are shown for each dependent variable (see tables 5 and 6).

Male players rated psychological influences higher than female players, where female players rated social influences, walking football culture, session specific factors and maintenance resources higher. The differences between male and female players on the combined dependent variables in maintenance (psychological influences, social-level influences, walking football culture, walking football session specific factors, and availability of maintenance resources) was not statistically significant ($F(5, 431) = 1.70$, $p = .13$, Wilks' $\Lambda = .98$; partial $\eta 2 = .02$). When assessing SES, low SES respondents reported psychological influences, social influences, walking football culture and session specific factors as being more influential on walking football maintenance than high SES counterparts, but those from high SES areas rated maintenance resources (e.g., scheduling session, sticking with the decision to attend) as being more of an influence in maintenance than low SES counterparts. The differences between high and low SES respondents on the combined dependent variables was not statistically significant ($F(5, 431) = 0.64$, $p = .67$, Wilks' $\Lambda = .99$; partial $\eta 2 = .01$).

[insert table 5 and 6]

Regarding weekly PA, those who participated in weekly PA for 5 or more days per week rated the highest on psychological influences, walking football culture, walking football session specific factors and maintenance resources. Those who engaged in weekly PA for 2-4 days per week rated the highest on social influences. The differences between the level of weekly PA on the combined dependent variables was not statistically significant ($F(10, 860)$

= 1.04, p = .41, Wilks' Λ = .98; partial η2 = .012). When assessing the number of health conditions, those with two or more health conditions rated the highest on social influences, walking football culture and maintenance resources, where those with one health condition rated the highest on psychological influences and session specific factors. The differences between the number of health conditions on the combined dependent variables was statistically significant (F(10, 860) = 2.58, p = .004; Wilks' Λ = .94; partial η2 = .029; d=0.21). Follow-up univariate ANOVAs showed that social interactions were statistically significantly different between respondents with different numbers of health conditions (F = 6.014, p = .003), using a Bonferroni adjusted α level of .01. Tukey post-hoc tests showed that for social influences, respondents with two or more health conditions had statistically significantly higher mean scores than respondents with no health conditions (p = .003). No significant differences were observed for either psychological influences or walking football environment.

[insert Figure 2]

Contributors to intention to return to play

For the regression analysis conducted, bivariate correlations and regression coefficients are presented below (see table 7 and 8). The intention to play (variable 1) was significantly and positively associated with one initiation variable, Psychological Influences (3), and all maintenance variables, including Psychological Influences (6), Social Influences (7), Walking Football Culture (8), Walking Football Session Structure (9), and Maintenance Resources (10). The multiple regression model statistically significantly predicted intention (F(13, 419) = 10.94, p < 0.001, adj. R^2 = .23). The model accounted for 23% of the variance, which is considered a medium effect size (Cohen, 1988). Two variables from maintenance,

walking football culture (8), and availability of maintenance resources (10), added statistically significantly to the regression ($p < .01$). The regression coefficient for walking football culture indicates that a point increase in the walking football culture mean score was associated with an increase of 0.100 in intention to play walking football after COVID-19 restrictions had eased. The regression coefficient relating to maintenance resources indicates that a point increase in availability of maintenance resources mean score was associated with an increase of .399, in intention to return to play walking football.

[Insert table 7 here]

[Insert table 8 here]

Discussion

This is the first study of its kind to assess influences for initiating and maintaining walking football play in older adults. Furthermore, this study builds on previous literature by assessing influences by group characteristics, including SES, gender, number of health conditions and weekly PA, and which influences contribute most to the intention to play walking football after COVID-19 restrictions eased. This study adds to the behaviour change literature, providing evidence for the presence of different influences at different stages of walking football participation, especially in specific group characteristics.

The respondent sample was mostly male players from high SES areas, which represents a similar ratio of male and female players participating in walking football in the general population (Walking Football Association, 2020). This supports previous research highlighting gender differences seen in sport participation, with players more likely to be male (Breuer et al., 2011). Further reports concerning SES also highlights that those from

higher SES areas tended to take part in more PA per week (Sport England, 2020a). Percentages of those reporting none, one, and two or more health conditions was in line with previous research, which have examined numbers of health conditions in older adults (Martinez-Gomez et al., 2017). Whilst weekly PA levels within the sample varied, it is important to note that over 40% of respondents perceived a decrease in PA over the COVID-19 pandemic, consistent with recent reports from (Sport England, 2021). Lastly, perception of sport participation levels from adolescence to middle age is consistent with previous reports and literature, which have stated a similar decline in both PA and sport participation (McPhee et al., 2016).

Differences in walking football initiation and maintenance influences across gender, SES, number of health conditions and weekly PA level

The significant results surrounding number of health conditions and social influences suggest that those with a higher number of health conditions rate social interactions as being more influential on the initiation of walking football (see figure 1). Regarding SES, gender and weekly PA results, this contradicts previous research into sport participation in older adults, specifically concerning gender differences and SES differences which have previously been seen amongst those participating in older adulthood (Faß & Schlesinger, 2019). Possible explanations for the inconsistency between previous research and this study may lie in the group characteristics, the sport context assessed, and the imbalance between male and female respondents. Firstly, within this population, influences of walking football initiation may not be affected by gender or SES level, as it may be in a wider sport participation context (Faß & Schlesinger, 2019). Secondly, walking football is a recently developed adapted sport, and it is possible that sport type and intensity may provide less variation in the influences assessed among these groups. This may be especially prominent when assessing influences by the

level of weekly PA performed, and due to the walking nature of the sport, walking football may be more accessible to those of varying PA levels, compared to other sporting contexts (Jenkin et al., 2017, 2018).

Post-hoc tests found that those with two or more reported health conditions rated social interactions higher than those with no health conditions, suggesting that those with more health conditions find social interactions a more important influence upon initiation of the sport. The findings support previous literature, which suggests that social support from both significant others and group members have been considered important in initiation of PA, and sport is important in fostering social connections (Jenkin et al., 2017; van Stralen et al., 2009). Furthermore, recent intervention research into walking football with older adults highlights the importance of social interactions amongst other players (Lamont et al., 2017; McEwan et al., 2019; Reddy et al., 2017). This study's results also support qualitative research where participants highlighted the importance of social connections in initiation when managing a health condition, feeling less isolated due to being surrounded with people who have similar health conditions (Cholerton et al., 2020). The current study's findings, coupled with previous research, highlights the importance of social interactions during initiation for those with a larger number of health conditions, and further research may consider investigating the use of walking football in improving social connections within those with health conditions. Despite these significant results, however, it is important to consider the small effect size, and in practice, social interactions may be one of many influences involved in initiation for those with a larger number of health conditions.

When investigating the second aim of the study - assessing differences in maintenance influences - no significant results were found between SES, gender and weekly PA levels

when investigating maintenance influences. During analysis of the number of health conditions, however, significant differences were found for social influences, and those with two or more reported health conditions rated social influences higher than those with no health conditions. This, as with initiation, suggests that those with more health conditions find social influences more important during maintenance of walking football. This also supports previous walking football research which found social connections were important for those managing mental health conditions (Lamont et al., 2017). In a PA context, social support from group members has been found to have a positive effect on maintenance in older adults (van Stralen et al., 2009). As the findings suggest that those with more health conditions tend to find social interactions as more important than those without, considerations should be made as to how peer support can be utilised for those who are managing health conditions whilst playing walking football.

For the third aim of the study, multiple regression results indicate that there are two contributors to the intention to return to play once COVID-19 restrictions had eased; positive walking football culture (e.g., players respecting each other's abilities), and higher use of maintenance resources (e.g., behaviours, such as scheduling in sessions on a weekly basis). The results suggest that the more positive the perceived walking football culture, the more likely players intend to return to walking football. Results also suggest that the more maintenance resources a player perceives themselves to use, the more likely they are to intend to play after COVID-19 restrictions ease. Little research has directly assessed the importance of a caring climate in older adults, within a sport context, however, results regarding a positive walking football culture and 'caring climate' have been found in youth sport participation, with caring climates having an effect on motivational outcomes and enjoyment of the sport (Gerabinis et al., 2018). Furthermore, previous research has

highlighted the importance of maintenance resources (e.g., action planning, coping planning) in long-term behaviour change in a general population (Kwasnicka et al., 2016; Peels et al., 2020). Whilst direct parallels cannot be drawn to other breaks in play such as injury or holidays, the ceasing of walking football sessions due to COVID-19 restrictions provides a similar context where there was a forced break in play for all walking football players in the UK. It is important to note that whilst no differences in gender, SES, number of health conditions and weekly PA were seen as influencing intention to play in these data, characteristics may need to be controlled for in future research. This may provide further understanding into factors that predict intention to play after a forced break.

Implications for future research

This study can help inform future research within the walking football context and help to examine the mechanisms involved in long-term behaviour change within this population. The research highlights the importance of social connections on those with health conditions in both initiation and maintenance phases, as well as a positive walking football culture and use of maintenance resources (e.g., scheduling sessions, redefining PA expectations) on the intention to continue after a forced break. Future research may consider generating hypotheses relating to the differences in influences between characteristics, and investigating the types of social influences which are most likely to aid initiation and maintenance in walking football players. Furthermore, assessing whether type of health condition (e.g. either mental or physical health conditions) affects influences at initiation or maintenance may be considered, to further support for specific health conditions.

Refining the survey questions used in this survey and running psychometric analysis (e.g., factor analysis) would assess the reliability of the constructs further. Research focusing on

the effects of a positive walking football culture on older adult sport maintenance may be considered, to further research based on the multiple regression results. The same applies to the use of maintenance resources, and further research including investigation of the types of maintenance resources used with older adult populations may be useful in understanding the mechanisms of maintenance in more detail, so older adults can be adequately supported in positive PA behaviour change. Research exploring the use of maintenance resources, and assessing fit with theories such as Self Determination Theory (Ryan & Deci, 2000), and frameworks such as COM-B and the behaviour change wheel (Michie et al., 2011) may be warranted, so robust intervention methodology can be developed to investigate the use of maintenance resources and the effect on initiation and maintenance of walking football. Techniques effective in positively changing behaviour can then be isolated, tested and encouraged among players.

Implications for policy and practice

The findings can inform future policy surrounding walking football, and initiatives to support older players in maintaining the sport. Policies around peer support systems, for example buddy schemes (pairing a new player with an experienced player), could be implemented, as highlighted in previous research as having an effect on PA levels in older adults (Lindsay Smith et al., 2017) and also may be particularly beneficial to those living with health conditions. In some cases, providing funding to set up clubs for those who manage certain health conditions may allow players to benefit from appropriate levels of play, and enhanced peer support. It is also important to consider the effects of a caring climate and a positive culture in the intention to continue playing walking football, which seems to be evident in older adults playing the sport. Previous research within organisational psychology has highlighted that positive perceptions of an organisation's culture has been linked with

employee retention (Anitha & Begum, 2016). This may be similar when assessing commitment and success in sporting contexts (Wagstaff & Burton-Wylie, 2018). Local Authorities, National Governing Bodies and coaches may consider encouraging a caring culture through marketing campaigns conveying messaging around understanding players' ability levels, and introducing a code fostering an inclusive playing environment, to encourage positive club culture.

Practice implications include considerations for the coach and individual clubs to consider. Within engagement and maintenance, this study highlights the need to understand the social requirements of those with health conditions. As other studies have highlighted the positive effects of social connections on PA participation in older adults (Maula et al., 2019), encouraging social events and sessions with those who have similar health conditions may promote longer-term engagement in the sport for this population. Furthermore, the COVID-19 pandemic has provided a unique environment to analyse PA patterns of older adults when going through a forced break from structured PA sessions. Overall, this study found that self-reported PA levels did not rise (70.5% reporting the 'same' or 'less' PA) during COVID-19 restrictions being implemented. This is in line with previous research stating a negligible rise in self-reported PA levels (Richardson et al., 2021). In light of previous research stating importance of understanding the lapse and relapse in maintenance of PA (Kahn et al., 2002), this research highlights the need for a positive sporting culture, and supporting players to increase maintenance resources. Regarding club practice, tailoring club environments (e.g. appropriate warm ups and sessions with reduced intensity) and actively fostering a positive culture (e.g. through fair refereeing and accepting all abilities into the club), may provide opportunities for long-term continuation in walking football. Regarding coach practice, training courses focusing on the key principles of creating a caring and positive culture,

alongside working with players to use maintenance resources, is important to consider. Previous research highlights the importance of coping strategies on a positive exercise outcome in long-term exercisers (Stetson et al., 2005), therefore providing tangible maintenance support to players may aid long-term continuation, for example by encouraging players to schedule sessions in advance and encouraging players to attend, despite adverse weather. Extra training for coaches in understanding behaviour change and how to encourage players to continue walking football may be beneficial, to support players in maintaining the sport.

Strengths and limitations

This is the first known survey assessing influences of walking football initiation and maintenance in older adults. This work strengthens the current literature by providing a context-specific analysis of influences on behaviour change in a specific age group. The online survey was developed using the qualitative data from the research team's previous qualitative research (Cholerton et al., 2020, 2021), assessing multiple influences that were discussed by participants directly. The qualitative work provided direct participant experiences that were a base for designing this study, and as limited research has explored experiences in this group and sport, provides a unique survey to assess behaviour change influences in walking football. Another strength of the study includes responses from a large sample (n=439) of walking football players between 50-75 years old, and sample size calculations suggest that the sample is adequately powered. Nevertheless, the sample of female players was low. Despite the sample being, to the researcher's knowledge, representative of the known population of walking football players in the UK (Walking Football Association, 2020), further research may look to increase the sample of female players in analyses, which may yield different findings. Furthermore, the respondents were

overwhelmingly based in England, compared with Wales, Northern Ireland and Scotland, despite researchers contacting organisations from all countries. Further representation of 50-75-year-old players in different countries within the UK could be achieved by working closely with national walking football organisations to promote research, and increasing accessibility to the survey, (e.g., providing bothonline and paper surveys) to improve response rates in this age group across the UK. It is also important to note the cross-sectional nature of the survey, assessing those who are actively maintaining, and also dichotomised SES scores may affect the detail of the SES data collected. Therefore, longitudinal or intervention research would be useful to conduct, as well as performing analysis with a wider range of SES levels to determine any smaller differences seen in this characteristic. Self-reporting and retrospective recall were also expected of the respondents, especially due to walking football clubs not playing due to the COVID-19 pandemic during survey distribution. Future research should attempt to survey those that are currently initiating the sport, in order to capture live initiation data.

Conclusion

This cross-sectional survey is the first to assess initiation and maintenance influences, across respondent characteristics, in 50-75 year old adults playing walking football. The survey results revealed that those with two or more health conditions rated social interactions as being more important to both initiation and maintenance, than those with no health conditions. Furthermore, walking football culture and the availability of maintenance resources were found to be significant contributors related to the intention to continue playing. Walking football clubs and bodies should consider the importance of delivering a positive and inclusive walking football culture. Further consideration should be taken concerning the encouragement of players using maintenance strategies to continue play, as

well as facilitating social connections in those with health conditions. Further research is needed to examine which factors in the walking football environment contribute to a higher motivation to maintain the sport, and test these within an intervention setting.

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Tables

Table 1

Respondent characteristics.

Participant Characteristic	Classification	Frequency	Percent
Gender	**Male**	392	89.3
	Female	47	10.7
Age Range	**50-54**	21	4.8
	55-59	72	16.4
	60-64	133	30.3
	65-69	131	29.8
	70-75	82	18.7
SES	**High**	297	67.7
	Low	142	32.3
UK country of residence	**England**	401	91.3
	Scotland	35	8.0
	Wales	1	0.2
	NI	2	0.5
Health Conditions	**0 HCs**	189	43.1
	1 HC	151	34.4
	2+ HCs	99	22.6
Weekly PA (days)	**0-1 day**	46	10.5
	2-4 days	235	53.5
	5+ days	158	36.0
Perceived change in PA COVID-19	**Less**	182	41.5
	Same	123	28.0
	More	134	30.5
Awareness of walking football	**Local flyer/poster**	57	13.0
	Local/national newspaper	50	11.4
	Half time during a game	4	0.9
	Social media	56	12.8
	Radio	2	0.5
	Friend told me about the sessions	148	33.7
	Other	122	27.8
		Mean	**SD**
Mean years playing sport between ages 12-18		5.58	1.18
Mean days per week playing sport between ages 12-18		3.68	1.58
Mean years playing sport between ages 19-34		12.44	3.92
Mean days per week playing sport between ages 19-34		2.86	1.32
Mean years playing sport between ages 35-54		13.97	6.01
Mean days per week playing sport between ages 35-54		2.47	1.30

Table 2

Cronbach's Alpha scores for survey subscales.

Subscale	Cronbach's Alpha (α) score
Initiation Variables	
Psychological Influences	0.84
Social interactions	0.69
Walking football environment	0.65
Maintenance Variables	
Psychological influences	0.81
Social-level influences	0.88
Walking football culture	0.81
Walking football session specific factors	0.70
Availability of maintenance resources	0.71
Intention to play	0.81

Table 3

Descriptive statistics on initiation influences across gender and SES.

Initiation Influences	Gender					SES				
	Male		Female			High		Low		
	Mean	SD	Mean	SD	*F*	Mean	SD	Mean	SD	*F*
Psychological Influences	3.69	0.74	3.74	0.87	0.18	3.67	0.78	3.75	0.70	1.26
Social Interactions	3.23	0.85	3.17	0.82	0.20	3.17	0.86	3.32	0.79	2.97
Walking football environment	3.97	0.70	4.16	0.68	3.28	3.98	0.71	4.02	0.70	0.37

*p<0.05

Table 4

Descriptive statistics on initiation influences across number of health conditions and weekly PA level.

Initiation Influences	Health conditions							Weekly PA						
	0 HCs		1 HC		2+ HCs			0-1 Days		2-4 Days		5+ Days		
	Mean	SD	Mean	SD	Mean	SD	*F*	Mean	SD	Mean	SD	Mean	SD	*F*
Psychological Influences	3.64	0.86	3.77	0.66	3.70	0.67	1.25	3.53	0.70	3.67	0.72	3.78	0.81	2.11
Social Interactions	3.11	0.84	3.23	0.84	3.43	0.82	4.88*	3.21	0.80	3.23	0.83	3.21	0.89	0.42
Walking football environment	3.95	0.71	4.05	0.73	3.98	0.65	0.84	3.86	0.75	4.00	0.70	4.02	0.70	0.86

*p<0.05

Table 5

Descriptive statistics on maintenance influences across gender and SES.

Maintenance Influences	Gender					SES				
	Male		Female			High		Low		
	Mean	SD	Mean	SD	*F*	Mean	SD	Mean	SD	*F*
Psychological Influences	4.24	0.59	4.18	0.75	0.41	4.21	0.63	4.27	0.57	0.73
Social Influences	3.09	0.86	3.19	0.82	0.55	3.07	0.87	3.16	0.83	0.87
Walking football culture	4.20	0.83	4.46	0.79	3.89	4.24	0.85	4.21	0.77	0.09
Walking football session specific factors	3.89	0.75	3.97	0.76	0.45	3.88	0.75	3.94	0.74	0.70
Maintenance resources	4.44	0.52	4.53	0.56	0.27	4.45	0.53	4.45	0.51	0.25

*p<0.05

Table 6

Descriptive statistics on maintenance influences across number of health conditions and weekly PA level.

Maintenance Influences	Health conditions							Weekly PA						
	0 HCs		1 HC		2+ HCs			0-1 Days		2-4 Days		5+ Days		
	Mean	SD	Mean	SD	Mean	SD	*F*	Mean	SD	Mean	SD	Mean	SD	*F*
Psychological Influences	4.20	0.66	4.29	0.53	4.20	0.62	1.24	4.11	0.64	4.21	0.60	4.29	0.61	1.80
Social Influences	2.95	0.82	3.15	0.88	3.30	0.83	6.01*	3.04	0.82	3.11	0.83	3.10	0.90	0.13
Walking football culture	4.24	0.83	4.19	0.87	4.26	0.76	0.26	4.03	0.83	4.24	0.79	4.26	0.87	1.45
Walking football session specific factors	3.87	0.79	3.96	0.71	3.87	0.73	0.72	3.69	0.84	3.90	0.73	3.96	0.75	2.31
Maintenance resources	4.43	0.54	4.45	0.50	4.49	0.53	0.37	4.44	0.52	4.44	0.51	4.47	0.56	0.10

*p<0.05

Table 7

Multiple regression coefficients and standard errors for intention to play.

Intention to play		99.0% Confidence Interval for B			Standardized Coefficients	R^2	ΔR^2
	B	Lower Bound	Upper Bound	Std. Error	β		
Model						0.25	0.23
(Constant)	3.28	2.77	3.80	0.20			
Gender	-0.06	-0.22	0.09	0.06	-0.05		
SES	-0.04	-0.14	0.06	0.04	-0.04		
Number of health conditions	-0.01	-0.08	0.05	0.02	-0.03		
Weekly PA	0.00	-0.07	0.08	0.03	0.00		
Perceived change in PA over COVID	0.04	-0.02	0.10	0.02	0.08		
Initiation: Psychological Influences	-0.07	-0.17	0.02	0.04	-0.13		
Initiation: Social Interactions	-0.05	-0.13	0.03	0.03	-0.10		
Initiation: Walking Football environment	-0.06	-0.15	0.04	0.04	-0.09		
Maintenance: Psychological influences	0.02	-0.10	0.14	0.05	0.03		
Maintenance: Social influences	0.02	-0.06	0.10	0.03	0.03		
Maintenance: Walking football culture	0.10***	0.03	0.17	0.03	0.20***		
Maintenance: Walking football session specific factors	-0.01	-0.10	0.08	0.03	-0.02		
Maintenance: Maintenance resources	0.40***	0.29	0.51	0.04	0.50***		

Note: Model = 'Enter' method in SPSS statistics; B = unstandardized regression coefficient; CI = confidence interval; R^2 = coefficient of determination; ΔR^2 = adjusted R^2. ***p<0.001.

Table 8

Descriptive statistics and bivariate correlations among study variables.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Intention to Play	4.86	0.42	1													
2. Gender	1.11	0.31	-0.01	1												
3. SES	1.32	0.47	-0.07	-0.01	1											
4. Number of health conditions	1.80	0.79	-0.04	-0.04	0.137**	1										
5. Weekly PA	2.26	0.63	0.04	-0.05	-0.04	-0.09	1									
6. Perceived change in PA over COVID-19	1.89	0.84	0.09	0.05	-0.04	-0.10	0.25	1								
7. Initiation - Psychological influences	3.70	0.76	0.13**	0.02	0.06	0.04	0.11	0.02	1							
8. Initiation - Social interactions	3.22	0.84	0.05	-0.02	0.09	0.143**	0.01	-0.10	0.47**	1						
9. Initiation -Walking football environment	3.99	0.71	0.09	0.09	0.04	0.02	0.06	-0.01	0.46**	0.51**	1					
10. Maintenance - Psychological influences	4.23	0.61	0.216**	-0.03	0.04	0.02	0.09	-0.03	0.71**	0.43**	0.45**	1				
11. Maintenance - Social influences	3.10	0.86	0.129**	0.04	0.05	0.17	0.02	-0.01	0.45**	0.63**	0.50**	0.43**	1			
12. Maintenance - Walking football culture	4.23	0.83	0.233**	0.10	-0.01	0.00	0.06	0.00	0.34**	0.40**	0.56**	0.37**	0.50**	1		
13. Maintenance - WF session specific factors	3.90	0.75	0.14**	0.03	0.04	0.01	0.09	0.06	0.47**	0.44**	0.64**	0.46**	0.56**	0.48**	1	
14. Maintenance - Maintenance Resources	4.46	0.52	0.439**	0.05	-0.01	0.04	0.03	-0.01	0.53**	0.34**	0.36**	0.59**	0.35**	0.32**	0.40**	1

**p<0.01