

Physical Activity in Retirement Transitions Study

Insight Report



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Introduction

The Physical Activity and Retirement Transitions study (PARTs) is an exploratory mixed-methods study funded by Sport England to help understand whether retirement transitions present a key opportunity to engage people in more physical activity (PA), and to explore personal experiences, barriers and facilitators to being and keeping physically active at a time of transition into retirement. It incorporates a literature review, secondary data analysis, survey methods and in-depth qualitative interviews, and was undertaken by Active Norfolk and the University of East Anglia.

The study's aim is to inform an appropriate approach to supporting and encouraging physical activity among adults during retirement transitions.

PARTs investigated the following research questions:

1. Does physical activity decrease as people transition into retirement?
2. What are people's individual experiences of whether physical activity increases or declines during the transition to retirement?
3. What are the barriers and facilitators to physical activity experienced by those approaching and transitioning into retirement and those recently retired?
4. What is involved in transitioning from employment to retirement, and where could an intervention be embedded in the process?
5. What sorts of physical activity intervention(s) might be appropriate for engaging people at the retirement transition stage?

In defining "retirement transitions" PARTs is guided by the findings of the English Longitudinal Study of Ageing (ELSA) study and therefore defines "retirement transition" as the period from age 55 and above. ELSA (2017) data show that most people in England transition to retirement during the ten-year periods either side of age 65 (approximate statutory pension age in recent years).

We consider age 55+ to be a pragmatic choice for defining our target participants, who are likely to be conscious of approaching retirement transition. We acknowledge that some people retire earlier or will not fully retire until much older (e.g., age 75).

Equally, some people do not necessarily know when they are in transition or when retirement will happen; retirement can even happen suddenly and unexpectedly.

Methods

PARTs employed the following methods to investigate the research questions: A review of existing literature was carried out to help understand existing evidence surrounding physical activity and transitioning to retirement.

Analysis of Active Lives Survey data was used to look at the significance and size of relationships between levels of physical activity and working status whilst controlling for other variables known to influence physical activity such as age group and level of disability.

Consultations with employers, older workers and retirees were undertaken using three separate approaches:

1. An online survey by Active Norfolk was developed and promoted to gather insight on the expectations and experiences of retirement of those aged 55+, as well as barriers, facilitators and preferences linked to physical activity.
2. Focus groups and interviews with older workers and retirees were held to obtain the views of older workers and recent retirees on their experiences of being and staying physically active during the transition to and at retirement.
3. Interviews with employers were designed to explore the role of employers in supporting retirement and physical activity, and the possibility of embedding an intervention.



Does physical activity decrease as people transition into retirement?

Literature review findings and discussion

Evidence on the impact of employment and retirement status on PA is mixed and should be treated carefully. Many longitudinal studies have found that retirees reported significantly greater PA, particularly in walking and moderate-intensity activities, compared with pre-retirement. However, Ding et al. (2016)¹ observed that the “activity-promoting effect” of retirement is likely to benefit those who retired at a younger age, possibly because of better physical function, and those who worked full-time prior to retirement.

They also caution against assuming retirees became more active overall. This coincides with findings from the EPIC-Norfolk cohort study which provided evidence that whilst retirement was associated with an increase in recreational and household pursuits, activity declined in retirement for transport and occupational pursuits so much so that there was an overall decline in physical activity². Further evidence also suggests that while leisure-time PA increases among those transitioning to retirement, overall PA does not necessarily increase³ and in fact decreases post-retirement⁴. Stenholm et al. (2016)⁵ observed a tendency for vigorous physical activity to decline with age among older adults, that was unaffected by retirement.

Baxter et al. (2016)⁶ were unable to find evidence about whether the retirement transition was a significant point for a PA intervention. They added that research “more generally indicated that a range of interventions might be effective for people around retirement age.” The suggestion to consider a range of interventions leads to an important point: the need to tailor interventions to ensure take-up or sustainability of engagement in PA.

Further to this, Godfrey et al. (2014)⁷ concluded that interventions are needed to increase PA in older adults as they approach retirement and in their post-retirement years. They quantified the association between retirement, ageing and interactions on sedentary and ambulatory outcomes in a group of retired and non-retired community-dwelling adults (average age 69.1 years). They found that the volume of sedentary behaviour increased with age, but ambulatory activity reduced with age. Furthermore, no difference existed between retired and employed adults in terms of recommended amounts of PA (only 21% achieved the recommended 150 min/week).

¹ Ding, D., Grunseit, A., Chau, J., Vo, K., Byles, J. and Bauman, A. 2016. Retirement - A Transition to a Healthier Lifestyle? Evidence from a large Australian study. *American Journal of Preventive Medicine*. 51(2): 170-178.

² Barnett, I., van Sluijs, E., Ogilvie, D. and Wareham, N. 2014. Changes in household, transport and recreational physical activity and television viewing time across the transition to retirement: longitudinal evidence from the EPIC-Norfolk cohort. *Journal of Epidemiology and Community Health*. 68: 747-753.

³ Barnett, I., van Sluijs, E.M. and Ogilvie, D., 2012. Physical activity and transitioning to retirement: a systematic review. *American journal of preventive medicine*, 43(3), pp.329-336.

⁴ Holstila, A., Mänty M., Rahkonen, O., Lahti, E. and Lahti, J. 2017. Statutory retirement and changes in self-reported leisure-time physical activity: a follow-up study with three time-points. *BMC Public Health*. 17:528 DOI: 10.1186/s12889-017-4455-9

⁵ Stenholm, S., Pulakka, A., Kawachi, I., Oksanen, T., Halonen, J.J., Aalto, V., Kivimäki, M. and Vahtera, J., 2016. Changes in physical activity during transition to retirement: a cohort study. *International Journal of Behavioral Nutrition and Physical Activity*, 13(1), p.51.

⁶ Baxter, S., Johnson, M., Payne, N., Buckley-Woods, H., Blank, L., Hock, E., Daley, A., Taylor, A., Pavey, T., Mountain, G. and Goyder, E. 2016. Promoting and maintaining physical activity in the transition to retirement: A systematic review of interventions for adults around retirement age. *International Journal of Behavioral Nutrition and Physical Activity*.

13:12 DOI: 10.1186/s12966-016-0336-3

⁷ Godfrey, A., Lord, S., Galna, B., Mathers, J.C., Burn, D. and Rochester, L. 2014. The association between retirement and age on physical activity in older adults. *Age and Ageing*, 43: 386-393.



Limitations

1. Lack of clarity about the specific nature and intensity of physical activities.
2. There is a lack of consistency in methods and measures used across studies.
3. Different types of cohorts are investigated making it difficult to aggregate findings reported across studies.
4. Many findings reflect self-reported data, which need to be treated with caution (as much for under-reporting as of over-reporting of PA).
5. More longitudinal studies that track PA post-retirement beyond a 12-month follow-up period are required to improve the evidence base.

Analysis of Active Lives Survey data findings and discussion

As demonstrated above, the evidence regarding the impact of retirement on domains of physical activity is mixed, and it is unclear whether changes in activity are at a suitable intensity to impact health (equivalent to at least moderate intensity).

Information collected on adults in England using the Active Lives Survey presented an opportunity to compare reported levels of physical activity (equivalent to at least moderate intensity) between those age 55+ working full-time, part-time or retired. We analysed data to see whether employment status is associated with a difference in physical activity levels.

The Active Lives Survey (ALS) 2016/17 for England was used to see how active people were depending on employment or retirement status. Activity levels were reported in the ALS using MIEMs (moderate intensity equivalent minutes; Milton et al. 2017). Types of physical activity considered were: leisure, gardening, active travel (walking or cycling) and their combined total activity.

Statistical analysis (using negative binomial regression models) was used to look for possible physical activity differences after adjusting for other sociodemographic variables: exact age, sex, BMI group, disability, rurality and deprivation, looking at all four types of PA. For variables used in regression

models see appendix. Table 1 shows the effects of work status alone (full-time, part-time or retired), stratified by age group (55-64 or 65-74).

Table 1: Effect of working status on four categories of physical activity, adults age 55-74

Adults age 55-64					Adults age 65-77			
Work Status	N	Median MIEMS	Difference from working FT	P value	N	Median MIEMS	Difference from working FT	P value
All physical activity								
Work FT	13,954	360	-	<0.001	1336	270	-	<0.001
Work PT	8087	405	45		3489	360	90	
Retired	9766	506	106		28,843	330	60	
Leisure only, which excludes gardening and active travel								
Work FT	13,120	280	-	<0.001	1350	150	-	<0.001
Work PT	8178	300	20		3533	240	90	
Retired	9943	375	95		29,228	217	67	
Gardening only								
Work FT	13,212	0	-	<0.001	1358	0	-	0.001
Work PT	8231	0	0		3549	0	0	
Retired	10,059	0	0		29,360	0	0	
Active travel only								
Work FT	13,221	0	-	<0.001	1360	0	-	0.002
Work PT	8237	0	0		3552	0	0	
Retired	10,070	0	0		29,409	0	0	

Note: MIEMs calculated as described in text (minutes of moderate intensity exercise, over 7 days). FT= full-time (working), PT= part-time.

Physical activity: Total and Leisure

Retired people aged 55-64 reported significantly greater total or leisure PA than people working part-time or full-time ($p < 0.001$). Furthermore, those who worked part-time reported significantly more physical activity than those working full-time ($p < 0.001$). Among persons aged 65-74, those who were working part-time reported similar levels of leisure and total PA as those who were retired. Retired and part-time workers' MIEMs were not significantly different from each other but were significantly different from reported MIEMs for full-time workers ($p < 0.001$).

Gardening

Among the under-65s, those who worked fewer hours tended to spend more time gardening, with full-time workers reporting 107 MIEMs, part-time workers reporting 115 MIEMs and retirees reporting 162 MIEMs of gardening on average.

Retired and part-time workers age 65-74 did similar amounts of gardening, which was significantly more than full-time workers. Nevertheless, most (67%) people aged 55-74 reported no gardening in the preceding four weeks. Among those who did any gardening PA, gardening comprised (on average) about 45% of reported MIEMs whether working or retired.

Active Travel

For both age groups, levels of active travel were significantly lower in those who were part-time and retired, compared to those working full-time ($p < 0.001$) with 34% of full- and part-time workers reporting some active travel compared with only 26% of retirees.

Those who worked fewer hours tended to report less active travel with active travel making up around 20% of full-time workers' PA and only 12% of retirees' PA. For those who did any active travel, active travel comprised approximately 37% of reported MIEMs, whether working or retired.

Discussion

Adults in England are spending more years of their life working than ever before, and with an ageing population there is also an ageing workforce who need support to age, work and retire actively. In England, participation in physical activity tends to decrease around the age of 55⁸, which for most older adults is whilst they are still employed. Transition to retirement takes on average 10 years and starts whilst individuals are still working and beginning to plan for retirement. This offers many opportunities for interventions to promote PA to prevent decline in activity, health and wellbeing.

Because the ALS (2016/17) data are cross-sectional, we cannot confirm change in activity after retirement or due to retirement. However, these results suggest that typically those who are retired report more overall PA, including leisure and gardening, but less active travel PA, than working persons of the same age. This highlights the potential loss of physical activity associated with retiring due to reduced active travel but also the potential increase in physical activity due to taking-up gardening or leisure activities when work hours are reduced.

These findings demonstrate the need for interventions that support individuals prior to leaving work, or reducing work hours, to lead active lifestyles in the lead-up to and during retirement.

Limitations

- The Active Lives Survey cannot describe change in activity among individuals, but rather participation rates at a single time-point (cross-sectional data).
- On average, participants in the ALS (2016/17) reported higher social class, occupational group, lower BMI and higher activity levels than the general English resident population. This lack of representativeness can reduce generalisability to the full population.
- Definitions of being employed, including if part-time or full-time in the Active Lives Survey, were self-defined and did not indicate the number of hours worked.
- The Active Lives Survey did not measure occupational physical activity and therefore differences due to loss of occupational physical activity are not captured in this report.

Key Findings: Does physical activity decrease as people transition into retirement?

Evidence in the literature around the direction and magnitude of changes in physical activity at retirement are mixed. There is some evidence to suggest that leisure-based physical activity typically increases in retirement, but that loss of other physical activity can mean that individuals are not more active overall.

Analysis of Active Lives Survey data found that for individuals aged 55-64, retirees reported the greatest levels of physical activity, followed by part-time workers, with full-time workers reporting the least. A similar trend was found for those aged 65-74 except that part-time workers had similar physical activity levels as retired individuals, both of which were significantly greater than those who were still working full-time.

These findings suggest that less time spent working is associated with greater overall physical activity levels, including gardening and leisure activities, and that those who work more do more active travel. Thus, transitioning away from employment can have a positive or negative impact on overall activity depending on individual's habits prior to retirement.

RQ2)

What are people's individual experiences of whether physical activity increases or declines during the transition to retirement?

Survey findings and discussion

The online survey was custom-written and widely promoted in Norfolk. Eligible respondents were aged 55+ and UK residents. Responses were collected between June and October 2018. 884 complete responses and 193 incomplete responses were received (1077 unique replies). Respondents were self-selected and likely to have an existing interest in physical activity thus reflecting the views of the core market better than those of individuals who have no interest or past engagement with physical activity. Table 2 compares expectations of physical activity (from respondents not yet retired) with experiences (statements made by those already retired).

Table 2: Expectations and experiences of physical activity after retirement

Statement	Somewhat or strongly agree	
	n=606	n=310
Since reducing my work hours I.../After I retire I expect to...	Experiences (retired)	Expectations (pre-retired)
Find it easier to find the time to exercise	71%	77%
Am more motivated to get and stay fit	66%	63%
Have more opportunities such as groups and organised activities I can access during the day	55%	65%
Do more activity with family and friends	52%	52%
Have more energy	40%	45%
Have taken up a new sport or activity	40%	41%
Have made new friends or networks to exercise with	38%	42%
Spend a lot of time caring for others so have less time to do physical activity	25%	21%
Find it harder to afford to pay for physical activities or equipment	24%	43%*
Don't have as many people to be active with	24%	11%*
Find it harder to motivate myself to be active	20%	18%
Miss out on walking or cycling as part of my commute to Work	18%	19%
Miss out on physical activity I used to do with colleagues or through work-place initiatives	13%	7%
Do less physical activity because my job was so physically demanding	10%	11%

In general, experiences were similar to expectations. Noticeable differences (indicated by * in Table 2) presented for expectations about participating in group and organised activities (experience was less than expected), expectations about cost barriers (experiences were that these were less than expected) and finding someone to be active with (experience was that this was more of a challenge than expected) suggesting the risk of poor social support post-retirement for doing physical activity may not be fully appreciated by those still in work.

We wanted to explore whether experiences and expectations differed between groups of individuals, so we separated these experiences and expectations into four subgroup types derived from data collected by the survey:

- Physical activity levels: inactive (≤ 30 MIEMs/week), insufficiently active (30-149 MIEMs/week) and active (150+ MIEMs/week)⁹
- Deprivation: Index of Multiple Deprivation (2015¹⁰) deciles 1-8 (lowest) and deciles 9-10 (highest)
- Socioeconomic status: Higher (NS-SEC1-2), middle (NS-SEC3-4), lower (NS-SEC5-9)¹¹
- Occupational PA: Low (>70% of work time spent sitting), high (<40% of work time spent sitting), medium (40%-70% of work time spent sitting) categorised using survey respondents predominant occupation.

Experiences and expectations tended to be very similar when responses were separated into subgroups. Some differences in subgroups were found for expectations relating to occupational PA and socioeconomic status. These were that respondents from lower socioeconomic groups (NS-SEC 5-9), or who did more active occupations, were less optimistic about becoming more active at retirement reporting consistently lower expectations of motivation, opportunities and the impact of retirement on their physical activity (Table 3). These may be due in part to existing levels of PA which was not controlled for in this analysis. Retirees from lower socioeconomic groups or more active occupations did not share these differences when it came to their experiences of retirement.

Table 3 Differences in subgroups, expectations in retirement

Question	Occupational PA			National socio-economic class		
	High n=76	Medium n=65	Low n=140	NS- SEC1-2 n=162	NS- SEC3-4 n=78	NS- SEC5-9 n=49
After I retire, I expect to...						
Be more motivated to get and stay fit	59%	68%	68%	73%	54%	53%
Have more opportunities such as groups and organised physical activities I can access during the day	57%	65%	74%	72%	62%	53%
Do less physical activity because my job was so physically demanding	21%	12%	8%	10%	6%	27%

⁹Chief Medical Officers. *Start Active Stay Active: A report on physical activity from the four home countries*. London: Department of Health and Social Care, 2011.

¹⁰English indices of deprivation 2015 <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>

¹¹The National Statistics Socio-economic Classification (NS-SEC) – Office for National Statistics <https://www.ons.gov.uk/methodology/classificationsandstandards/otherclassifications/thenationalstatisticsocioeconomicclassificationnssecrebasedonsoc2010>

Limitations

- PARTs survey respondents were self-selected. They over-represented NSSEC classes 1-2 and low deprivation areas.
- Respondents reported higher levels of PA than the English resident population is believed to have on average (for this age group).

Consultation findings and discussion

As part of the survey, participants were asked whether they would like to take part in an interview or focus group to talk about their experiences of physical activity at retirement. 489 respondents opted in and the information they provided as part of the survey was used to purposively sample participants with a range of experiences and backgrounds to take part in focus groups across 5 areas in Norfolk, in both urban and rural areas.

Individuals took part in an interview (n=10) or in one of 5 focus groups (n=29) and their comments were transcribed and analysed to identify common themes. To examine peoples' different experiences of whether physical activity increases or declines during the transition to retirement, the participants' comments were grouped into those who increased and those who decreased their activity during or following retirement.

Of those who reported an increase in their PA (n=18) during (or immediately after) their transition to retirement, a number attributed this to their increased awareness of the impacts of growing older and how this triggered a desire to start healthier habits.

One participant recalled her own transition ten years previously when she was in her 50s: she became aware of a physical difference in herself, which triggered her decision to engage in more physical activity: "I decided I needed to do something because there might be a kind of stage where if I don't do something now, I'm going to struggle."

Also, working less was felt by several interviewees to afford them greater opportunity to be active, including taking part in structured activities.

A participant who is now working part-time reported doing more walks and being part of walking groups because of being part-time (she also aims to join classes during the day, such as Pilates, and do bicycling, when she is fully retired).

Of those who reported a decrease in their PA during (or immediately after) their transition to retirement some felt that this was largely due to retiring from a physically-demanding job.

A few participants are / were employed in off-shore work. While off-shore, the work was physically demanding. On-shore, they tended not to do much in the way of PA. Deteriorating health and energy levels associated with growing older were also felt to result in less activity both whilst working and in retirement.

Several participants described becoming "knackered" or "very tired" in their 50s, because of which they either decreased their PA or stopped altogether.

Some participants reported having knee or back problems or having to face the impact of other conditions (e.g., one participant now lives with a stoma; another is unable to exercise as much as he would like owing to prostate cancer).

In general, we found that levels of physical activity fluctuated across the transition to retirement for individuals, with the majority reporting periods of much lower physical activity as they approached retirement but then increasing activity once retired.

Limitations

- The views reflected here are of a self-selected group and whilst offering depth of experience are not representative.

Key Findings: What are peoples' individual experiences of whether physical activity increases or declines during the transition to retirement?

Retirement is seen by many as an opportunity to increase physical activity with a large proportion (65-77%) of people aged 55+ expecting to have more time, motivation and opportunities to take part in physical activity when they retire. This is also experienced by the majority (55-70%) of retired persons over 55. However, there are still 30-45% of people aged 55+ who don't experience these benefits when retiring with 1 in 4 people facing barriers linked to caring responsibilities, affordability and availability of peer support. Whilst 40% experience having more energy and taking up a new sport or activity when they retire, this is not the case for around 60% of adults over 55.

Experiences and expectations linked to retirement and PA were typically similar for individuals regardless of activity levels, deprivation, socioeconomic status, and physical activity undertaken as part of their occupation. There was some variation in expectations in lower socioeconomic groups, and those who did more active occupations. However, these differences were not reflected in the experiences of those who had already retired. Overall, this suggests that the experiences of retirement and PA are generally consistent regardless of activity levels, deprivation, socioeconomic status and occupational PA.

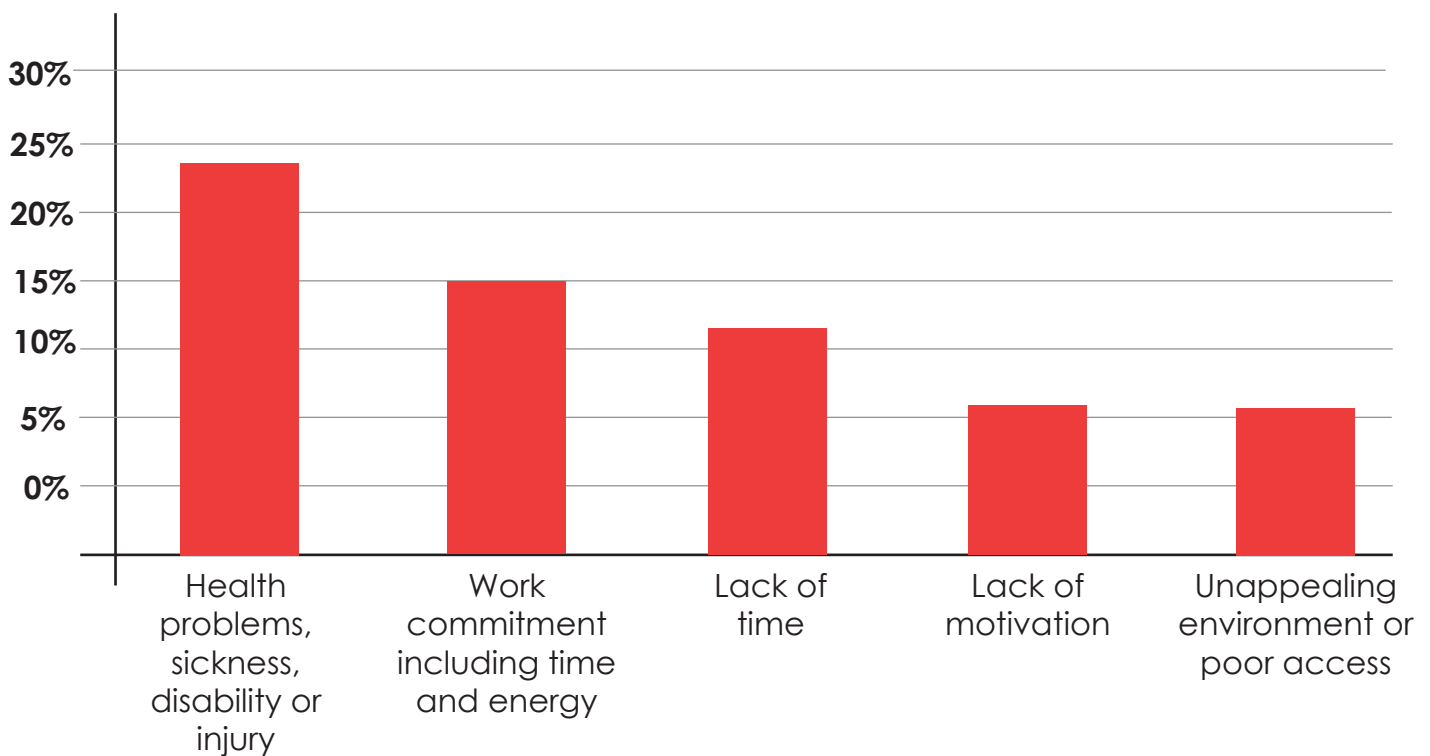
RQ3)

What are the barriers and facilitators to physical activity experienced by those approaching and transitioning into retirement?

Barriers to Physical Activity: Survey and Consultation findings

The survey found that there is a clear demand by those over 55, whether still working or retired, to be more physically active with 72% saying they would like to be more active than they are now. When asked as part of the survey "Is there anything in particular that currently gets in the way of you being physically active?", 32% of respondents gave no answer or said that nothing got in the way, while 68% described in their own words barriers that they face. These barriers were then grouped into key themes and the prevalence of the most commonly reported barriers are reported in the graph below. These barriers and facilitators have also been found to reflect perspectives of older people reported in the literature.¹²

Most commonly reported barriers



Health

The survey found that the most common barrier to engaging in PA for those between the ages of 55 and 75 was health (24%) and that the prevalence of health as a barrier was greater amongst older age groups (18% 55-59 years; 24% 60-64 years; 30% 65-69; 29% 70-79 years; 35% 80+ years). This was echoed in the views and experiences of those interviewed with all reporting a negative impact of health issues on physical activity. For some, health presented a greater barrier than for others and this tended to reflect the severity of the health concern. Musculoskeletal pain and decreasing energy levels were the main health problems.

¹² Franco, M.R., Tong, A., Howard, K., Sherrington, C., Ferreira, P.H., Pinto, R.Z. and Ferreira, M.L., 2015. Older people's perspectives on participation in physical activity: a systematic review and thematic synthesis of qualitative literature. *Br J Sports Med*, 49(19), pp.1268-1276.

However, participants were generally accepting of their limitations and willing to work around them, saying they were “adjusting... how they used to do things”, “watching what they were doing” or “customising what things you do relating to your health and your body”. This highlights a willingness amongst this group to adapt and overcome health barriers to being physically active and thus presents an opportunity to support more people to be active around retirement by offering suitable advice and opportunities.

Mental health issues or depression were also mentioned as a key barrier to PA, even if on a short-term basis. “Peaks and troughs” were reported by two participants in the same focus group: one spoke about going through “a low patch” after experiencing a succession of health problems. Other participants in the group affirmed that they had “moments of up and down”, one adding that it is “life getting in the way ... life has a habit of doing that”.

Work:

For those still working, either part- or full-time, work was frequently reported (55%) as a barrier to being physically active either due to the amount of time it took up or the physical or mental energy it required.

There was a general sense that those approaching retirement looked forward to retirement as an opportunity to be less tired and busy and therefore feel more capable of being active.

I am already thinking of ways that I can become active when I do retire. For example, I intend to buy a new cycle which is something that I used to enjoy when I was younger but find work currently gets in the way.

Raising the retirement age means most people are at work and unavailable. You need to stick to the lower retirement age to establish new ways and friends before you are elderly.

There was also a sense that activities targeted at this age group did not cater for those still at work, which presented further barriers to being more active.

I would like to do a class to help me stay flexible, something like yoga or dance, but all the classes for over-55s are during the day when I am at work.

Lack of time/convenience

Lack of time or convenience, often linked to work or other responsibilities, such as caring for someone, was frequently reported as a barrier to being more physically active.

There's literally no hour in the day left to do anything for yourself.

I am a full-time carer, my husband has dementia and physical disabilities therefore I find it very hard to get time for myself.

With regards to convenience, emphasis was placed on activities being suitable, nearby, accessible via public transport, flexible to attend ("pay as you go"), and affordable with a reasonable amount of choice.

Despite thinking I'd have much more time to run in the mornings and go to classes I find it even harder to fit things in.

There are not enough 'classes' for relatively fit people of my age! They're all directed at youngsters or sitting on a chair lifting your arms!

I would like more activities that are fun but taking into consideration people's abilities, we are kids at heart!

The sports centre is too far away, there's no public transport, so I have to rely on lifts from friends.

If I want to do a specific activity the times can be limited by public transport. For example, I have to have a cab home from my tai chi class.

I'm more likely to attend a group exercise class if it's within a mile of where I live - to reduce cost, travelling time and not have to rely on public transport.

Improved provision, promotion and communication of suitable local activities could help address some of the convenience barriers previously mentioned.

I'm still searching for the time, location and group.

Other lesser-reported barriers (<10%)

Insufficient motivation was a barrier for a small proportion of respondents (6%). Some participants suggested that guidance and group support could help improve their motivation.

Motivation and guidance seem very important to me.

I would like to do more, I need motivation and good company to enjoy it with.

As mentioned previously with regards to convenience, the suitability and appeal of facilities and environments to be active in can be a barrier for some. In focus groups, participants highlighted the need for instructors to understand the motivations, needs and limitations of older persons.

Instructors need to understand the fact that you're not there training for the Olympics and understand more about the older person's body, things like arthritis.

Some participants felt that gyms and classes were targeted at "young people" and cited the type and volume of music, competitive atmosphere, imagery and messaging used in marketing, which made them less welcoming for their age group.

Using pictures of super-fit, slim people... well, it's not for me.

We're not all the same and we're not all motivated by the same thing.

The local media never actually feature people like me who walk half of parkrun and then run the other half, so perhaps they've lost sight of what they're trying to achieve.

These comments suggest that more could be done to promote activities in an appealing way to older age groups and work with providers to improve how inclusive activities and facilities look and feel.

Consultation and survey findings for facilitators

When asked as part of the survey “Is there anything in particular that currently helps you to be physically active?”, 77% of respondents described in their own words things that support them to be active. These facilitators were then grouped into key themes and the prevalence of the most commonly reported facilitators is represented in the graph below.

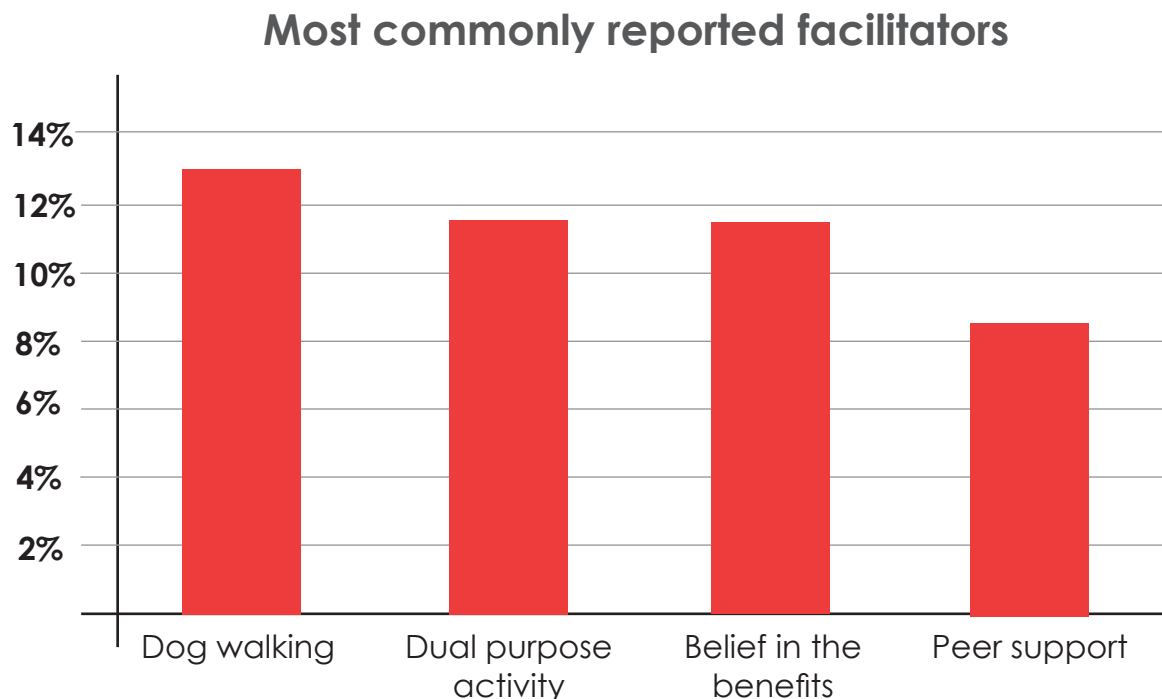


Figure 2. Graph showing frequency of facilitators reported in PARTs survey

Dog

The survey found that the most common facilitator for being physically active was owning or looking after a dog (13%).

Having a dog that needs walking whatever the weather.

Some of those interviewed reported they had got a dog when they retired because they would have more time to look after it and it would encourage them to go for regular walks.

Dual-purpose activity (excluding dog walking)

12% of respondents found that doing things in which physical activity was a by-product, such as gardening, volunteering, housework, and caring for grandchildren, helped them to be more active.

I find it easier to be active when there is a point to the activity. I don't do pointless exercise.

I do birding and general wildlife conservation type activities. Sunday afternoon outings - open gardens, walking etc, and gardening.

I volunteer as a warden at a reserve every week.

Benefits of physical activity

Findings also showed that knowing and valuing the benefits of PA was motivational and helped individuals to be active.

Any kind of exercise is good for your mind, body and soul really as well as keeping you fit.

I have health problems that are improved through exercise, this helps to motivate me.

Individuals who had experienced the benefits of physical activity felt this made it easier to prioritise.

Participant: I feel better when physically fit and active.

Interviewer: Is there anything in particular that currently gets in the way of you being physically active?

Participant: No, I don't let it.

Concern over deteriorating health, function and mobility was also a significant motivator for people to keep or get active.

I'm trying to stay as healthy and fit as possible.

We need to keep our health in order to get the best value of the time we've got and if we've not got our health then we can't make the best use of our time because we've both retired from quite stressful jobs we've actually seen lots of people who've become quite unwell once they've given up work so that's my motivation and I did have type 2 diabetes.



Peer support and social interaction

When physical activity was part of a social activity, this helped motivate some people to be active.

I think if you've got somebody to do something with you're more likely to do it, if I were on my own I'd just feel like I can't be bothered to do it.

Although I love walking, I'd rather sometimes do it with a group or a group of friends you know rather than on my own.

Similarly, feeling encouraged and supported by others motivated some to be active with others or alone.

My partner encourages me to do physical activity such as walks and dancing.

Concerns emerged about becoming socially isolated, with some using physical activity as a means of connecting with people and getting out.

I push myself to go out to meet other people and avoid becoming a bit of a recluse. Without friends you do go down-hill fast.

I wanted to go to different groups and classes so that I could ensure that I socialise with people, I think the social aspects of belonging in the community are as important as the physical activity.

Participants did not necessarily engage in PA only in a social context. Several reported that they enjoyed doing an activity by themselves as much as when they joined friends on a walk or others in a class.

Other lesser-reported facilitators (<9%)

Enjoying physical activity was a facilitator for a small proportion of respondents (7%).

I just enjoy line dancing and don't think of it as being physically active. I also know that it improves me mentally by remembering the dances.

Having sufficient free time, usually the result of reducing work hours, made it easier for some to prioritise physical activity.

Having to work less gives me a bit more time to spend on exercise.

For some traveling to places by foot or bicycle helps them to lead more active lives, particularly for those commuting to and from work actively.

I purposely cycle to work each day in order to maintain my current level of fitness.

I try to walk or cycle for short journeys.

Although not mentioned as frequently as the facilitators above, a small proportion of participants (<5%) did refer to good weather, goal-setting, routine, activity linked to work, a supportive environment, caring for relatives including grandchildren, having a good instructor, and being able to afford activities as facilitating physical activity.

Limitations

- PARTs participants were self-selected and the views are mostly that of those with some interest in physical activity already, which for the purposes of understanding the core market and their barriers and facilitators to physical activity at retirement is a strength. However these findings may not reflect the views of those with no interest or past engagement with physical activity.
- Barriers and facilitators given by participants were unprompted and therefore may differ from responses that may have been given if a list of options was provided.

Key Findings: What are the barriers and facilitators to physical activity experienced by those approaching and transitioning into retirement?

Being physically active plays a vital role in ageing well and confers a range of physical and mental health benefits for people of any age. Promoting the physical and mental health benefits of ageing actively could help over-55s prioritise PA more as they're motivated by the benefits and slowing decline. However, poor health can prevent some people from doing activity. This suggests that supportive and adaptable opportunities to be active, which take into consideration health limitations, are important to this group, as well as the flexibility to be able to drop-in and out of activities to respond to their health.

Work was one of the main barriers getting in the way of physical activity for those aged 55+, particularly as attractive opportunities, such as over-55s classes, are usually offered during conventional working hours. Ensuring that formal activity opportunities targeted at this age group are available outside of conventional working hours could see more over-55s being active whilst still in employment.

Activity that is a result of other purposeful actions such as looking after a dog, gardening, housework, childcare, volunteering, etc., emerged as a key facilitator. Physical activity by stealth strategies, such as community gardening groups, could be used as a means of engaging more over-55s in PA, particularly those who are not primarily motivated by exercise.

Socialising was found to be a priority for some members of this age group and was motivational when combined with PA. Offering social physical activities, for example walking groups, and placing emphasis on the social component of the activity could therefore attract people who otherwise struggle to be active to increase their activity and reduce or prevent social isolation.



RQ4)

What is involved in transitioning from employment to retirement, and where could an intervention be embedded in the process?

Employer consultation findings and discussion

Prior to this study little was understood about the processes and touch-points that exist in the approach to retirement that could be used to embed interventions to ensure ongoing or re-establishing physical activity habits. In response to this, we arranged to speak with five different employers in Norfolk, with numbers of employees ranging from 190 to over 7,000, to investigate ways in which employees retire and what could be done to support physical activity to play a role in retiring.

Through interviews and focus groups with PARTs participants and consultations with employers, we found that the transition into retirement was highly individual and that there was no common process across organisations to support people to retire to which physical activity could be added. However, three of the five employers consulted mentioned some form of retirement planning support, although this mainly focused on financial matters and tended to be offered by larger employers.

Retirement planning advice or activities present an approach that considers the personal nature of retirement to which PA nudges could be added. One of the PARTs (retiree) participants spoke very positively about a pre-retirement workshop she had attended which included a wide spectrum of information and support including physical activity. Nevertheless, they were the exception with most PARTs participants saying that their employers provided no pre-retirement planning support.

I went on the course thinking this is about helping how I live on less money, but actually that was only about an hour of the two days. Most of it was about reminding you, about thinking about yourself as a person, rather than you as your job, this was about the next bit of your life and you have to think of it seriously, more holistically, and that included your health, and that was one of the motivations for me losing weight and taking exercise. So I came for a course that was about life and lifestyle rather than what I thought I was going on, which was "how do you live on less money".

Participants themselves weren't sure where employers might embed support in the transition to retirement. Some suggested that workplaces could play more of a supporting role by providing specific information on the benefits of PA and the opportunities to be active as part of wider mental and physical health awareness raising for all employees, but particularly targeting those approaching retirement age. Several employers and participants felt that due to the personal circumstances of each person's retirement, support should be tailored to the individual. Providing support to plan for retirement which includes PA, as part of a holistic approach to retirement, with a focus on overall wellbeing, was suggested as a means of supporting employees to retire actively.

Employers were cautious about targeting employees nearing retirement age with retirement-related messaging due to concerns that employees might think they are implying that they should be considering retirement causing them to worry about job security. Equally, employees expressed concerns over talking openly about retirement before they had made the decision to retire due to worries this might have negative repercussions.

Some employers did offer various activities and incentives to their employees to be active including classes available on-site such as yoga and pilates, walking and running routes and groups, active travel incentives such as cycle-to-work schemes, discounted gym memberships, etc. However, these initiatives were not aimed specifically at older employees due to concerns about appearing to discriminate based on age. One employer remarked that the provision at his workplace was “suitable for all abilities”, rather than designated for particular age groups. The employers pointed out that their employees in the 55+ age group were less inclined to do competitive activities, particularly with a mixed age-group, and often liked the opportunity to combine activities, like walking, with socialising. They observed that having low-intensity activities on offer, such as walking and yoga, tended to encourage more older workers to take part compared with alternative activities.

A few participants in focus groups and interviews felt that organisations did not prioritise health and wellbeing initiatives as the latter's focus was on profitability. This reflects the most recent health and wellbeing at work survey for the UK (2018)¹³, which found that UK organisations still vary considerably in how proactive they are in promoting employee wellbeing. For example, while 40% have a standalone wellbeing strategy in support of their wider organisation strategy the remaining 60% do not, and nearly one in five reports that their organisation is not doing anything to improve employee health and wellbeing.¹³

The report concluded that budgetary constraints and value for money have a significant impact on the decision to purchase wellbeing benefits, more so than managing identified health issues, employee feedback or alignment with the organisation's health and wellbeing strategy. The report also stated that organisations with a standalone wellbeing strategy tend to take a fairly holistic approach, promoting all aspects of employee wellbeing (particularly physical health, mental health and good lifestyle choices). Whereas those who are more reactive are less likely to be promoting any aspect of wellbeing. Embedding physical activity as part of health and wellbeing in the organisation's policies and practices was highlighted in the consultation as a potential means of boosting activity before and during the transition to retirement.

More needs to be understood about any existing good practice employed by specific organisations, employers' responsibilities, interaction with the voluntary sector and communications from retirement groups. Understanding these processes becomes more difficult when considering the varied and transitional nature of retirement.

Limitations

- PARTs participants were self-selected and the views are mostly that of those with some interest in physical activity already, which for the purposes of understanding the core market and their barriers and facilitators to physical activity at retirement is a strength. However these findings may not reflect the views of those with no interest or past engagement with physical activity.

Key Findings: What is involved in transitioning from employment to retirement, and where could an intervention be embedded in the process?

The process or journey for people transitioning to retirement is varied making it challenging to identify a single mechanism across organisations to embed an intervention. Where pre-retirement support is offered, embedding physical activity nudges could help people to plan for an active retirement.

Some organisations are not proactive in promoting employee wellbeing whilst others offer a range of health and wellbeing initiatives. There are opportunities linked to both scenarios by encouraging and supporting organisations to implement policies and initiatives to promote physical and mental health, and healthy lifestyles including physical activity, and ensuring what is offered supports older employees.

Sensitivity around use of age- or retirement-related messaging can make it difficult to target those approaching retirement age with information and support. Whilst not wanting to discriminate or single employees out based on age, having a range of opportunities to be active at work (providing this can be reasonably provided by employers), including low intensity exercises, social, and non-competitive activities could help encourage older workers to be active before they retire and encourage them to remain active throughout their transition to retirement.





RQ5)

What sorts of physical activity interventions might be appropriate for engaging people at the retirement transition stage?

PARTs survey and consultation findings and discussion

Physical Activity Preferences

PARTs survey participants were also asked how important (not at all, a bit, or a lot) it was to them that physical activities are; outdoor, for all ages, etc. To investigate whether inactive respondents had different preferences to the sample as a whole, these were reported separately in Table 4.

Table 4 physical activity type and context preferences

How important is it to you that physical activities are:	A lot	
	Whole sample n=899	Inactive n=213
Activities I can do on my own	52%	46%
Outdoor activities	51%	41%
Activities for all ages and abilities	35%	32%
Activities I can do in my home	27%	33%
Activities specifically for people your age	21%	34%
Activities specifically for those with health conditions	16%	25%
Activities I can do that also help the community	16%	20%
Activities I can do with my family	16%	10%
Group activities	14%	13%

Activities that are outdoors appealed to the largest proportion of PARTs survey participants suggesting agreement with Active Lives Survey findings that the most popular activities amongst this age group are walking for leisure or travel, and gardening. Cycling for leisure and fitness classes are also popular activities among men and women aged 55+ respectively according to ALS. Interestingly, the survey found that over a third of respondents felt it was important that they could take part in activities for all ages and abilities with 21% and 16% of respondents stating that activities for their age group or health condition was important. However, it is notable that inactive participants placed greater importance on activities that are age- and health-specific.

Options to support over-55s to be active

As part of the PARTs survey, participants were asked to rate how useful they would find ten different support options for helping them to maintain or increase their physical activity as they transitioned to retirement based on their experience, if already retired, or on their expectations, if not yet retired, the results of which are presented in Table 5.

Table 5: The proportion of PARTs survey participants who would find the following physical activity support options 'very useful'

Physical Activity Support	Very useful	
	Retired	Pre-retired
The opportunity to try an activity for free	49%	61%
To receive advice about physical activity from a health professional as part of a health check	39%	38%
An online directory/search tool to allow you to find suitable physical activity options in your area	32%	34%
A supportive fitness instructor or mentor to guide you through physical activity	31%	31%
Some guidance on what you can do at home or by yourself	21%	23%
Personalised support to help find a suitable physical activity for you	21%	21%
Advice on how to get to places on foot or by bike	20%	21%
Somebody to accompany you	19%	15%
Support to find others to do physical activities with	19%	17%
Information on local green space where you can spend time outside	18%	19%

The results presented in Table 5 highlight that there is no one-size-fits-all approach to supporting over-55s to be active in the lead-up to and following retirement and working to improve key parts of the system has the potential to achieve the greatest impact for this audience and can be grouped into several themes.

Support to find and try suitable activities

Providing opportunities to try activities for free is a simple and low-cost intervention which could help support around half of retired and pre-retired adults over-55 to maintain or increase their PA and could easily form part of a workplace and leisure offer.

Having an easy-to-use online directory, or search tool, which enables the user to find suitable activity opportunities in their area also came out as a high priority intervention that could benefit around a third of over-55s by supporting those who are contemplating physical activity to try something that is at a suitable time, location and intensity for them, particularly if available to try for free.

An activity finder could be developed to signpost to resources which support individuals to do self-directed activities, including apps like Active10, couch to 5k, yoga studio etc, as well as signposting to local greenspace and trails which would support individuals who don't have suitable formal activity opportunities available in their area.

Workforce development

Health professionals have a key role to play in promoting the benefits of PA to this age group and advising them to be more active. Around 39% of individuals highlighted this as a very useful form of support that could be offered during a health check to help them maintain or increase their PA. Social prescribing presents a similar opportunity in Norfolk to provide the personalised support to find suitable activities that around a fifth of over-55s said they would find useful. This therefore presents an opportunity to develop the health and social prescribing workforce locally to train and support them to promote physical activity and signpost over-55s to local opportunities by linking in with a supportive activity search and instructive apps, mentioned previously, and other local initiatives such as parkrun and health walks.

The findings of this survey highlight the role that the PA workforce has to play in supporting and empowering this audience to be more physically active. The Reimagining Ageing report¹⁴ highlights that 88% of physical activity sector employers currently believe that exercise professionals could be better supported to work with older adults, and that a lack of communication and behavior change skills has been identified as one of the key skills gaps amongst activity professionals in the sector today. Given that the average age of those working in the sector is 38, and older adults are under-represented in the sector, it is not surprising that this customer group are seeking “supportive fitness instructors” to mentor and guide them through physical activity. Offering older adults the opportunity to train and become these instructors has the potential to make the sector more appealing and relatable to this age group, as well as upskilling the existing workforce in this area.

Peer and social support

A smaller proportion (15-20%) of over-55s felt that having somebody to be active with would encourage them to maintain or increase their PA. Free group taster activities could support this age-group to join activities they can then do with others or try them with somebody they know. Working to make activities provided by the PA sector more inclusive and attractive to this audience by encouraging social interaction and a welcoming atmosphere as part of workforce training could help support people to access peer support to be more active. Adding physical activity to existing social groups and networks could help people to feel more supported to be active .



Key Findings: What sorts of physical activity interventions might be appropriate for engaging people at the retirement transition stage?

There is no one-size-fits-all approach to supporting over-55s to be active in the lead-up to and following retirement. Working to improve key parts within the system has the potential to achieve the greatest impact for this audience.

This population feel that they would benefit from having easier access to information about opportunities to be active locally, including formal activity sessions, things they can do themselves, and nearby walking, cycling and greenspace opportunities. All of this could potentially be addressed using a purpose-built activity finder. In addition to this, the intervention they felt would help them the most was the opportunity to try an activity for free.

Workforce development, including training health professionals and social prescribers to promote physical activity and signpost over-55s to local opportunities, has a key role to play in helping more over-55s maintain and increase their PA during this significant transition period. By ensuring that the PA workforce has the right skills and experience to tailor activities and styles to meet the needs of over-55s, existing activity opportunities could be made more inviting, accessible and supportive for this group.



Summary

Adults in England are spending more years of their life working than ever before, and with an ageing population there is also an ageing workforce who need support to age, work and retire actively. The Physical Activity and Retirement Transitions Study (PARTS) investigated five research questions to gather insight about the relationship between retirement and physical activity. PARTS defines the “retirement transition” as the period from age 55 and above where older adults are likely to be conscious of approaching retirement and beginning to plan and take steps to move away from the labour market.

In England, participation in physical activity tends to decrease around the age of 55¹⁵, which for most older adults is whilst they are still employed. Frailty and pre-frailty (the decline in health, resilience and mobility, often associated with ageing) are conditions previously expected to be found in people at retirement age and over, but now these conditions affect a third of British adults aged 50-65¹⁶. Transitioning to retirement is a life-changing event which provides opportunities for behaviour change and coincides with declining physical activity, health and wellbeing associated with age. The approach to retirement therefore presents an opportune time to protect existing PA habits, combat decline and enable individuals to be active prior to and following retirement.

Does physical activity decrease as people transition into retirement?

Evidence in the literature around the direction and magnitude of changes in physical activity at retirement is mixed. There is some evidence to suggest that leisure physical activity typically increases in retirement, but that loss of other physical activity can mean that individuals are not more active overall.

Analysis of Active Lives Survey data suggests that over the age of 55, less time spent working is associated with greater overall physical activity levels, including gardening and leisure activities, although those who work more do more active travel. Transitioning away from employment can therefore have a positive or negative impact on overall activity depending on an individual's habits prior to retirement.

What are people's individual experiences of whether physical activity increases or declines during the transition to retirement?

The PARTS survey found that retirement is seen by most over-55s as an opportunity to increase PA and many find that once retired they have more time, motivation and opportunities to take part in PA. However, the survey found that there are still 30-45% of people aged 55+ who don't experience these benefits when retiring, and a quarter of people face barriers linked to caring responsibilities, affordability and availability of peer support which prevent them from being as active as they'd like.

¹⁵ Active Ageing - Sport England <https://www.sportengland.org/our-work/health-and-inactivity/active-ageing/>

¹⁶ Palmer, K.T., D'angelo, S., Harris, E.C., Linaker, C., Gale, C.R., Evandrou, M., Syddall, H., van Staa, T., Cooper, C., Sayer, A.A. and Coggon, D., 2017. Frailty, prefrailty and employment outcomes in Health and Employment After Fifty (HEAF) Study. *Occup Environ Med*, 74(7), pp.476-482.

What are the barriers and facilitators to physical activity experienced by those approaching and transitioning into retirement?

The main barriers to PA reported in PARTs were poor health, not having enough time or energy due to work, and a general lack of time or convenient PA opportunities. Other lesser reported barriers to PA included; lack of motivation, unsupportive or unrelatable instructors, and finding activity opportunities intimidating and unappealing.

Whilst retirement may remove some of the barriers previously preventing people from being active, deteriorating health and wellbeing that could be addressed by supporting people to be active in the lead up to retirement (55+) mean that the challenge of becoming active at retirement is greater. Supporting older adults to lead active lifestyles ahead of, and at retirement could ensure people are more mobile, capable and healthier once retired.

Activity that is combined with socialising or results from other purposeful actions such as looking after a dog, gardening, housework, childcare, volunteering, etc., emerged as key facilitators for this audience.

What sorts of physical activity interventions might be appropriate for engaging people at the retirement transition stage?

There is no one-size-fits-all approach to supporting over-55s to be active in the lead-up to and following retirement. Working to improve the key parts within the system has the potential to achieve the greatest impact for this audience.

Making information about local opportunities to be active more accessible could help this target audience to be more active. Providing opportunities to try activities for free could also enable more people to maintain or increase their PA in the lead up to and during retirement.

Recommendations for supporting physical activity during this retirement transition

Due to the complex and varied nature of retirement in England the research leads us to recommend a systems approach, identifying key parts of the system to influence, to support people aged 55+ to retire actively. This approach should be made up of strategies that target those who are working full-time, part-time and who are retired, influencing policy and provision across three key areas; provision and opportunities to be active, the workplace, and support services.

Provision and opportunities to be active

Opportunities to be physically active exist mainly within three contexts. These are;

- Activity provided or facilitated by the sport and physical activity (SPA) sector
- Activity led by or held in communities
- Activity directed and undertaken by individuals

The findings of PARTs highlight the value of improving access to opportunities in each of these contexts for over-55s in the lead up to, and during retirement.

Areas for improvement within the sport and physical activity sector:



Time:

Ensure suitable opportunities are available at times that support over-55s who are still working full- or part-time as well as those who are fully retired.



Type:

Provide a variety of opportunities including activities that are low-intensity or can be adapted to suit a range of abilities and are promoted as such.



Price:

Offer free taster sessions and affordable or discounted opportunities to encourage over-55s to take up activities.



Visibility:

Diversify marketing and communication to represent over-55s and develop strategies to market opportunities to be active specifically to this age group to encourage over-55s to take up activities.



Social:

Build in opportunities to socialise before, during or after activities to help with uptake and retention of this age group and provide peer support during this transition.



Supportive:

Offer a mix of general activities that are suitable for all ages and abilities and specific activities that provide additional support for over 55s or those with health conditions. Offer support to individuals to enable them to undertake activities on their own.



Workforce:

Up-skill the SPA workforce to better understand and cater for older adults and encourage over-55s to enter the SPA workforce and become role models and advocates.

Areas for improvement for community physical activity opportunities:

Empower individuals and communities to lead and take part in physical activities. Work with community groups and services to embed physical activity opportunities suitable for this age group so that SPA opportunities are available in a range of settings which may appeal to this audience and not just leisure centres. E.g. local parks, community centres, libraries etc.

Harness the potential of activity that is a result of other purposeful actions such as volunteering, community action and intergenerational activity and play.

Areas for improvement to support self-determined or unstructured activities

Provide clear and accessible information to support people to access unstructured, independent and self-motivated activity including access to green space and the outdoors.

Workplaces

PARTs findings highlight the important role that workplaces can play in supporting workers to be physically active as they approach retirement. The research leads us to three potential key areas for improvement, influencing employers to offer:

Wellbeing policies and strategies:



Have an employee health and wellbeing policy that promotes physical activity for all employees, including over 55s, to formalise organisational commitment to employee physical activity.

Workplace physical activity offer:



Encourage older workers to be active before they retire by promoting and providing a range of opportunities to be active at work, including low-intensity exercises, social, and non-competitive activities that appeal to older employees. E.g. walking groups. Include sport and physical activity offers and incentives in employee benefit packages to encourage uptake of external activity opportunities and initiatives. E.g. Cycle to work schemes.

Pre-retirement support:



Develop a pre-retirement support package to help employees prepare for retirement that includes nudges to encourage them to think about physical activity and make plans to be active in their retirement.



Support services

The research has outlined the importance of receiving information about physical activity and especially from trusted sources. This presents an opportunity to influence a range of services and front-line staff to support older adults to be active in the lead up to and during retirement. These include health professionals, social prescribers, and age or retirement-related support services e.g. Age UK.



Training:

Train professionals to promote a culture shift and encourage them to advocate keeping active as people age. Build professionals' confidence in providing physical activity advice and support, and raise awareness of available resources or opportunities to signpost over 55s to.



Promote:

Include physical activity in communication that is likely to reach this target audience. Make information about the benefits of remaining active whilst ageing visible and attractive to over 55s ●

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Appendix

Variables used in multivariate regression models (Active Lives Survey 2016/17)

Attribute	Description, with regard to data for all adults age 55+
Age	In whole years, no missing data
BMI Group	Reduced to 3 categories = Healthy weight (reference, 42% of useable data) Underweight or overweight (1.5% + 38% of useable data) Obese or morbidly obese (17% + 1.4% of useable data) Missing data so not useable = 9389 replies, 10% of all responses
Disability	2 categories = with limiting disability (25% of useable data) or not 5331 observations (5.7% of total) had missing data so were unuseable in adjusted models
Gender	2 categories= male or female (52.3%). Respondents with missing data for sex (n=37/93,509) or non-M/F status (n=2) were excluded from all comparisons due to very small numbers.
Index of multiple deprivation 2015	2 categories, deciles 1-7 as reference, variant= deciles 8-10 (24.6% of responses; proportionally should be 30% of total). Data missing for 2 responses
Rural/Urban classification of home address, from ONS RUC2011 data	6 categories available. 2 responses were unclassified so not useable. Categories = Urban major conurbation 24.2% Urban minor conurbation 3.4% Urban city and town 46.5% Rural town 12.0% Rural village 8.9% Rural Hamlets 5.0%
Working status	Models only consider 3 categories, which encompassed 88.6% of all respondents. Respondents defined for selves what (how many hours) FT or PT meant. Categories were: Working full time (reference), working part-time or retired

