

# **GOLF CLUBS AS HEALTH HUBS**

**INNOVATE UK**

**Small Business Research Initiative**

**Collaborative project between Golf in Society, Sport for Confidence  
and Sheffield Hallam University**

**Project Evaluation Report**

**Dr Rachel Young  
Dr Kerry Griffith  
Dr Francesca D'Andrea  
Dr Simon Goldsmith  
Dr Ben Heller  
Dr Tom Maden-Wilkinson  
Ryan Sylvester**

## **ABSTRACT**

### **Background**

Golf in Society is a social enterprise which enables older adults with age-related impairments and their caregivers to engage in physical activity and access support. This mixed method project evaluated the introduction of tailored physiotherapy and occupational therapy sessions during a 12-week programme.

### **Aim**

To evaluate the impact and reported experience of an inclusive golf intervention integrated with tailored Physiotherapy (PT) and Occupational Therapy (OT) amongst older adults with age-related impairments and their care-givers.

### **Method**

Measurement of physical impact: Golfing participants with age-related impairments attended up to 3 sessions at the Advanced Wellbeing Research Centre during their 12-week programme. The following measurements were recorded; Timed Up and Go, 30s Repeated Sit to Stand, Hand Grip Dynamometry, 10m Walk Test and stance on force platform. T-tests were calculated to detect statistically significant changes in physical performance.

Caregiver and service provider experience: Caregivers were invited to share their experiences of the project through semi-structured interviews and an on-line survey. Service providers were invited to share their perspectives through semi-structured interviews. Thematic analysis was conducted on the qualitative data. A descriptive analysis was conducted on the survey data.

### **Results**

Physical impact: Twenty one participants were recruited to the physical impact arm of the project, although two deceased prior to baseline measurement. The mean age was 80.7 (8.26) years with 13 males and six females. Seventeen participants completed the programme and 16 attended at least one follow-up measurement session. Two participants dropped out due to illness. Analysis of pre and post intervention physical performance indicated marginal improvements which were not statistically significant.

Caregiver and service provider experience: Seven caregivers, two golfing participants and 6 service providers participated in semi-structured interviews. Thematic analysis of data indicated that caregivers valued the opportunity for their family member to take part in a meaningful activity. Input from the PT and OT helped with engagement at the golf clubs with the added benefit of advice and activities which could be implemented at home. Service providers identified challenges associated with participant recruitment and the limited timescale of the project. However, the opportunity to work with participants in a non-traditional setting was deemed highly beneficial. Survey data indicated high levels of satisfaction with the intervention amongst caregivers.

## **Conclusion**

It was feasible to integrate PT and OT interventions within the Golf in Society programme and multiple benefits for caregivers and participants were reported. Due to the complex and heterogenous nature of the sample, the measurement of physical impact of the programme did not detect statistically significant changes. Recommendations for future research and implementation include development of existing connectivity with NHS and third sector providers to increase participant recruitment.

## **BACKGROUND**

This project explored an innovative model of healthcare delivery to address the challenges associated with cognitive decline and frailty amongst older adults through the reimagining/repurposing of golf clubs as Health Ageing/Research Hubs. Golf in Society is a social enterprise which was launched in 2016 and the team are now recognised as experts in inspiring older people with specific health conditions to enjoy golf. Support for caregivers is central to the ethos of Golf in Society as partners of participants have the opportunity to take some time for themselves or engage with other caregivers. Golf in Society has an established relationship with Sheffield Hallam University through the 2020 University Enterprise Zone Accelerator scheme which implemented qualitative methods to explore the users' experience of the programme.

In December 2022 the project team were successful in the application for £358,155 SBRI funding to support the co-design and evaluation of a programme of physiotherapy (PT) and Occupational Therapy (OT) into inclusive therapeutic golf sessions. The study was funded to deliver the "Golf-in-Society" intervention to older adults with early-mid stage cognitive decline and/or age-related physical impairment. The intervention comprised a 12-week programme located at one of two selected golf clubs in the Sheffield City Region. The intervention was delivered by employees of Golf in Society/Sport for Confidence and researchers from Sheffield Hallam University conducted a mixed method evaluation of the programme.

Physiological and biomechanical baseline and post-intervention measurements at the Advanced Wellbeing Research Centre (AWRC) examined the physical impact of the programme. Qualitative and self-report wellbeing data was collected from caregivers to explore the experience of the programme from their perspective and analysed by Senior Researchers in the Sport Industry Research Group (SIRG). Service providers and stakeholders were invited to share their experiences and perspectives during a one to one interview. The project aligned with Sheffield Hallam's mission to transform lives and the AWRC's commitment to develop innovations which enable movement, address health inequalities and promote physical activity for all members of society.

## **Project aims and objectives**

Overarching aim:

To evaluate the impact and reported experience of an inclusive golf intervention integrated with tailored PT and OT amongst older adults with age-related impairments and their care-givers.

Two distinct arms underpinned this evaluation project:

'Physical impact' measured physical impact of participation in the programme by people with age related cognitive and/or physical impairment (objectives 1&2).

'Care-giver/service provider experience' explored the caregivers' and service providers' experience of the programme (objectives 3&4)

### Objectives

1. Recruit and consent eligible participants to the evaluation strand of the project.
2. Conduct baseline, interim and post-intervention measurements of strength, balance and mobility to examine the physical impact of the programme upon older adults.
3. Explore the experience of programme participation with caregivers to gain insight into their perspective and impact upon self-reported wellbeing.
4. Explore the experience of programme delivery with deliverers, volunteers and wider stakeholders, to explore the process (what works, why, lessons learned).

## PHYSICAL IMPACT: METHODS

### Recruitment and consent

Potential participants and their caregivers attended a taster session at the Golf Club during which they had the opportunity to meet the team and decide whether they wished to volunteer to take part in the project. The eligibility criteria are listed below:

Inclusion criteria:

- Able to walk 10 metres (can use walking aid if required)
- Able to grip and manipulate items with hands
- Able to cope with new situations and people

Exclusion criteria:

- Unstable hypertension
- Unstable diabetes
- Unstable angina
- Uncontrolled cardiac arrhythmias
- Unable to transfer from sitting to standing independently
- Patterns of aggressive or distressed behaviour triggered by new situations or people
- Severe disorientation in new surroundings which may trigger anxiety

Participants recruited to the quantitative arm of the project evaluation were required to visit the motion analysis laboratory at the AWRC three times. Participants attended a baseline session at the AWRC during which consent was confirmed and the initial physical measurements were recorded. Participants with complex physical and/or cognitive impairments attended the baseline session with their caregiver. A detailed medical history was also recorded. This included a conversation about how they had been made aware of Golf in Society and their expectations of the project. During follow-up visits the research team enquired about any changes in their health and their experiences of the golfing intervention.

The first visit was scheduled before the start of the golf sessions, the second visit was an interim assessment after 6 weeks, and the final visit was planned at the end of the 12 weekly golf sessions for the post-intervention assessment.

During each visit, we asked the participants to complete the following tests:

- *Repeated sit to stand*: Participants were asked to complete 30 s of repeated transitions from sitting to standing from a 45 cm high chair with arms. Participants were encouraged to perform the test with arms folded. Participants who could not complete the movement with their arms folded were advised to push down through their upper limbs from the chair and this was noted. The number of complete repetitions was recorded. Before performing the test, the researchers demonstrated the test and the participant to familiarised with the exercise during 2-3 practise repetitions.

- *Timed up and go (TUG)*: For this test, a 45 cm high chair with arms was used and a distance of 3m. was measured from the base of the front legs of the chair and marked positioning a brightly coloured cone on the floor. The participants were asked to stand from the chair, walk around the cone, return to the chair, and sit down. Two timing gates were positioned next to the chair in order to record the time from standing to sitting down. The researchers demonstrated the test and allowed the participant to familiarise with the exercise.
- *10 m walk test (10MWT)*: Two timing gates were positioned at 10 m distance to record the time for participants to walk between them. Participants were instructed to start behind the first timing gate and walk in a straight line towards a researcher waiting for them beyond the final timing gate where they were instructed to stop. The time to complete the 10 m walk measured by the timing gates was recorded.
- *Hand grip strength*: This test was performed using a hand grip dynamometer (Fig. 1). While the participants were sat on a chair, they were asked to hold the dynamometer with one hand, four fingers on one side of the handle and the thumb in the opposite side of the handle. They were instructed to keep their elbow at 90° and squeeze for 3 s as hard as possible the handle of the dynamometer, which returned the maximum force value recorded. The test was performed three times for each hand and the highest measurement per side recorded as the best effort.



Figure 1: hand grip dynamometer.

- *Static balance*: Participants were instructed to position one foot on each of two adjacent force platforms and to adopt a comfortable standing position with their arms by their sides and looking straight ahead. A single trial of 30 s was performed and the centre of pressure (COP) from each force platform recorded. The root mean square (RMS) sway in both antero-posterior (AP) and medio-lateral (ML) directions was calculated combining the measurements from the feet.

T-tests were performed for each test to determine if statistical differences were present between the baseline and the final assessment data. Alpha value was set at 0.05.

## Participants

Twenty-one participants were recruited to the physical impact strand of the project. A summary of medical history, age and social circumstances is presented in Table 1.

**Table 1: Participant information**

Participant code	Sex (M/F)	Age	Medical history	Social circumstances
GP001	M	83	Heart failure Pacemaker for bradycardia Dementia Parkinson's disease (7 years) Low back pain Knee osteoarthritis	Lives with wife who is main caregiver. Always enjoyed golf.
GP002	M	89	Partially sighted Alzheimer's diagnosed 2020 Anaemia	Lives with wife who is main care-giver in sheltered accommodation
GP003	M	71	Parkinson's disease diagnosed 2020 Dementia Hypertension Postural hypotension	Lives with wife but was admitted to Nursing Home during project due to increased care needs. Previously very active lifestyle.
GP004			Deceased	
GP005	F	93	Pacemaker (5 years) Atrial fibrillation Vertebral wedge fracture (2 years ago) Osteoporosis Early dementia, attends memory clinic	Widowed and lives alone with daughters helping. Enjoyed very active life, hill walking and visits to Scotland plus gardening.
GP006			Deceased	
GP007	M	79	X2 stents fitted 1999 Occasional mild angina symptoms (uses GTN)	Lives with wife and to some extent is a care-giver
GP008	F	82	Alzheimer's	Lives in nursing home
GP009	M	82	Pituitary adenoma (30 years) Vestibular migraines Bilateral knee replacements Pulmonary fibrosis Mild memory impairment	Lives with wife who is care-giver
GP010	M	85	Atrial fibrillation (medicated) COVID in Spring 2023: caused seizures and hospital admission, triggered memory changes Abdominal Aortic Aneurysm (small/recent)	Lives with wife and they have recently moved into sheltered accommodation.
GP011	F	84	Type 1 diabetes (aged 32) Asthma Recent hospital admission for 8/52 with gastric symptoms ? allergy? Some joint pain	Recently moved into sheltered accommodation with her husband.
GP012	F	73	Asthma OA and RA: widespread joint pain X2 meningitis (2015/17) Hypertension	Plays tennis. Helps her husband and also cooks for her daughter's family.
GP013	M	74	Pacemaker (11 years) Heart failure in 2020 (frusemide) High cholesterol Alzheimer's (2020)	Lives with wife. Walks every day. Believes cognitive changes due to ion imbalance.
GP014	M	89	Cardiac symptoms being monitored Dementia (5 years)	Lives alone as wife admitted to a nursing home. Granddaughter helps.
GP015	F	90	Low grade breast Ca Pulmonary embolism (5 years) Hypertension Parkinson's disease (3 years)	Recently widowed and moved to Sheffield to be near daughter. Lives in sheltered accommodation.
GP016	M	62	Stent fitted for angina in 2015 High BMI Vascular dementia diagnosed 2019	Had to take early retirement due to dementia symptoms, worked for the bus service. Lives with wife who is main care-giver.
GP017	F	81	Long term anxiety, recent severe episode Pacemaker fitted for tachycardia Asthmatic Back and hip pain	Lives alone with sister nearby. Was a foster carer throughout adult life.

GP018	M	86	Dementia Generalised pain (joints) X2 episodes of chest pain, ECG normal	Lives with wife who is main care-giver. Was very sporty and competitive as a younger adult.
GP019	M	82	Stroke 6 months ago Early dementia	Recently bereaved as wife passed away. Lives alone with grown up children nearby.
GP020	M	84	X4 strokes over past 20 years Occasional falls Recent low back pain Type 2 diabetes	Recently bereaved as wife passed away. Lives alone with daughter nearby.
GP021	M	68	MI and triple bypass (15 years) Parkinson's disease (2019) ?Lewy body dementia	Was a senior engineer. Lives with wife with grown up children nearby.

## PHYSICAL IMPACT: RESULTS

In the following table a summary of the number of weeks between the assessments for each participant is reported. Due to several reasons, such as illness and transport issues, the 6 and 12 weeks markers for the assessment were adjusted. For the analysis of the results, when a participant attended only two sessions, an 8-week period was considered as the threshold to classify the second and final assessment as the interim or post-intervention one. Participants GiS004 and GiS006 were scheduled to attend, but withdraw (deceased) before the baseline assessment. Participants GiS012 and GiS013 attended the baseline assessment before withdrawing.

**Table 2: Summary of measurement time-points**

PaID	week number baseline assessment	week number interim assessment	week number post-intervention assessment
GiS001	0	8	16
GiS002	0	8	17
GiS003	0	7	
GiS004			
GiS005	0	9	14
GiS006			
GiS007	0	7	12
GiS008	0	7	12
GiS009	0	6	12
GiS010	0		9
GiS011	0		9
GiS012	0		
GiS013	0		
GiS014	0	6	
GiS015	0	5	11
GiS016	0		10
GiS017	0	7	
GiS018	0	7	
GiS019	0	5	
GiS020	0		
GiS021	0	4	

The mean age of recruited participants was 80.7 (8.26) years, ranging from 62 years to 90 years. Thirteen males and six females were recruited and attended the baseline session.

The mean values calculated for the baseline and final measurements for each participant who attended at least two sessions at the AWRC are summarised in Table 3.

**Table 3: Mean values**

30s Sit to Stand (reps)		Timed Up and Go (s)		10MWT (s)		Right Hand Grip		Left Hand Grip	
Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final	Baseline	Final
7.93 (1.94)	8.46 (2.72)	15.85 (6.26)	15.72 (5.52)	13.03 (5.69)	12.00 (3.03)	21.4 (8.88)	22.65 (9.35)	21.41 (8.82)	20.52 (8.63)

Marginal improvements in repeated sit to stand, TUG, 10MWT and right hand grip were detected.

In table 4, the results of the t-test are reported. No statistical differences were present in any of the tests performed.

**Table 4: T-Test results**

Test	p-value
Sit to stand	0.784
Time up and go	0.963
10 m walk	0.675
Right hand grip	0.988
Left hand grip	0.851
RMS AP COP	0.558
RMS ML COP	0.943

Data for each individual participants is represented in Figures 2-8 below:

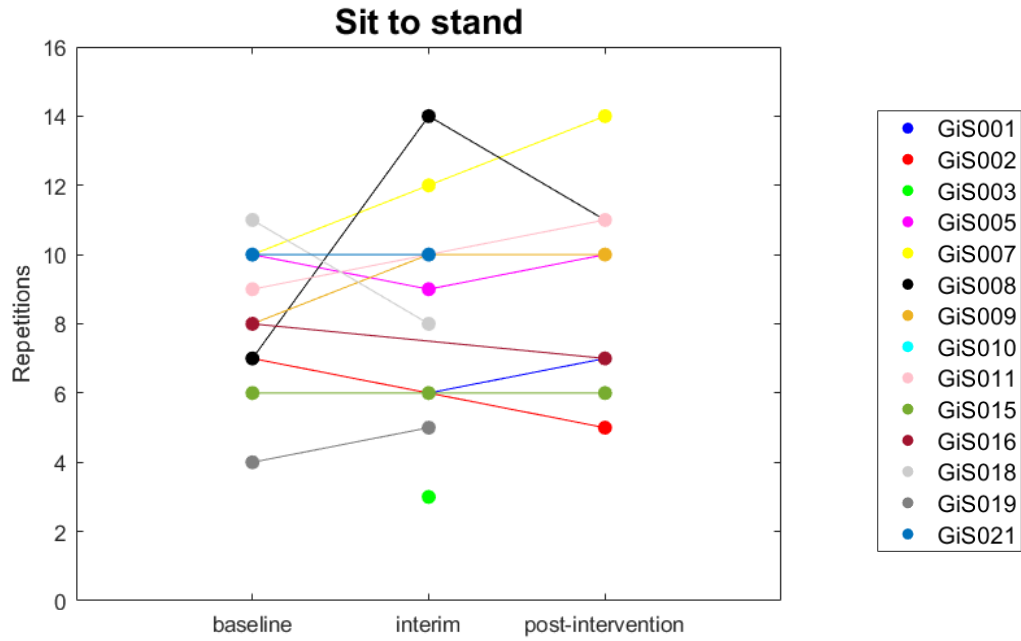


Figure 2: the number of repeated sit to stand movements performed in 30 s is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

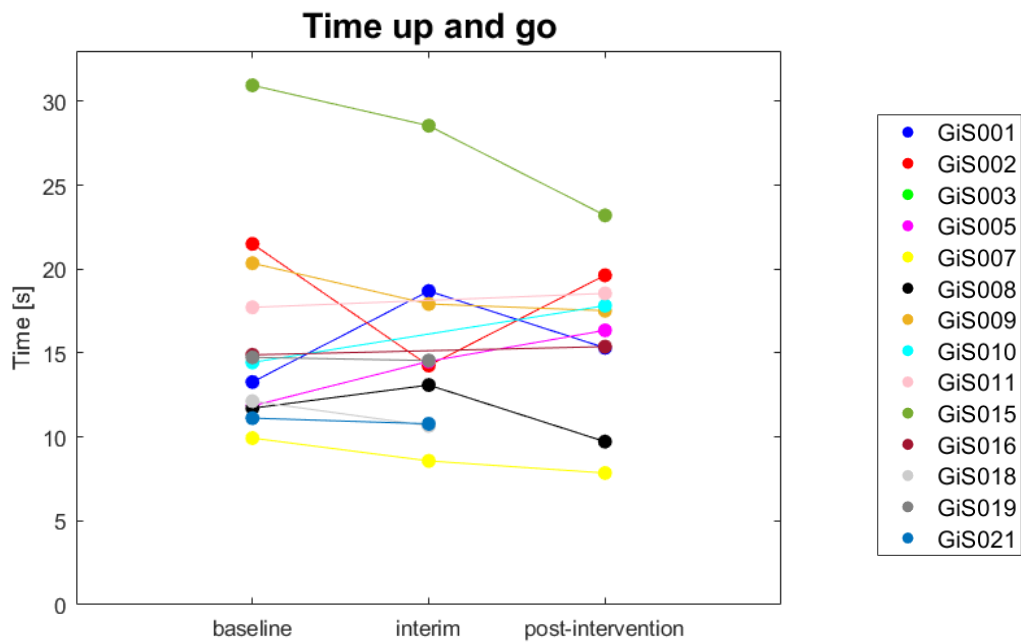


Figure 3: The time necessary to complete the time up and go test is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

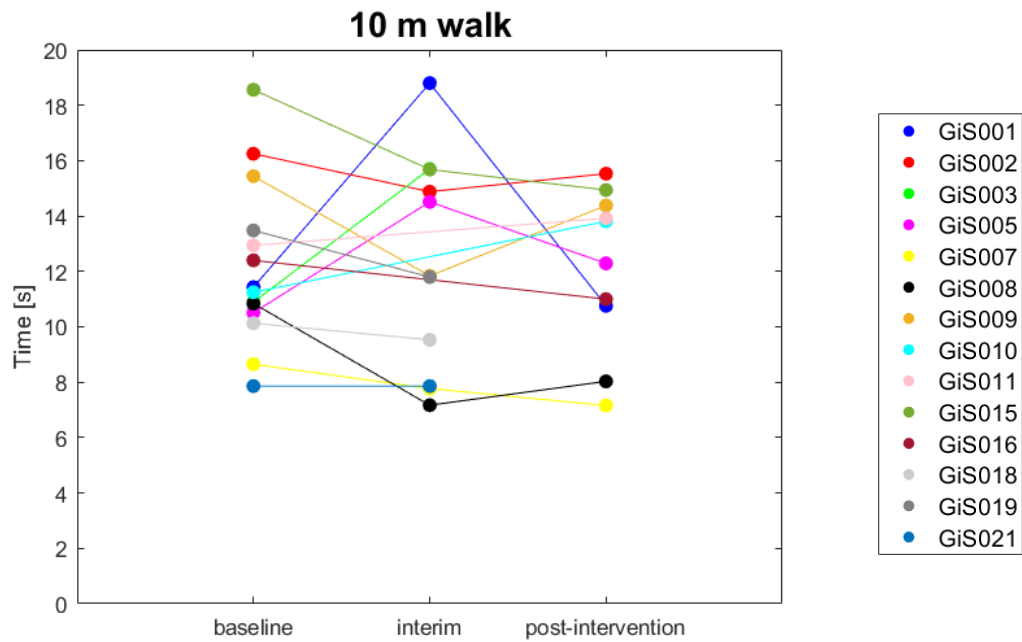


Figure 4: The time necessary to complete 10 m of straight walk is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

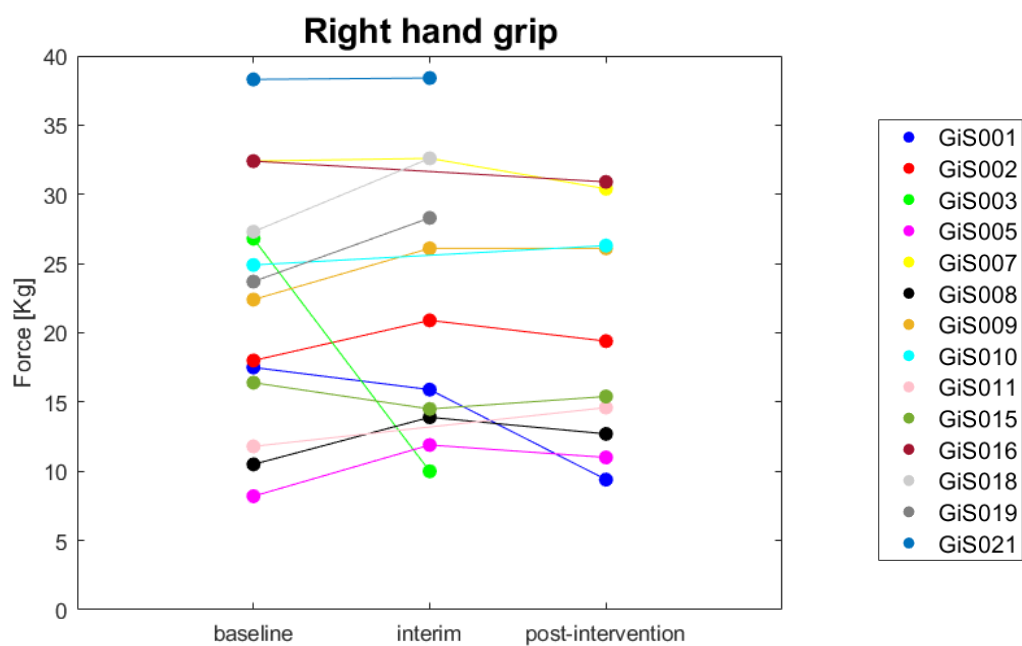


Figure 5: The maximum force recorded for the right hand grip test is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

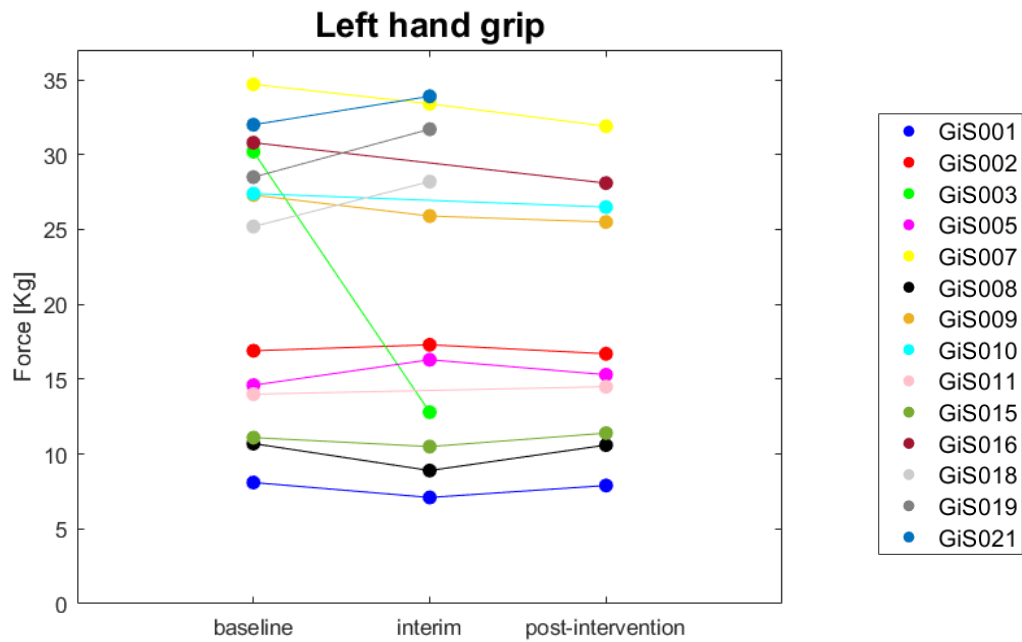


Figure 6: The maximum force recorded for the left hand grip test is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

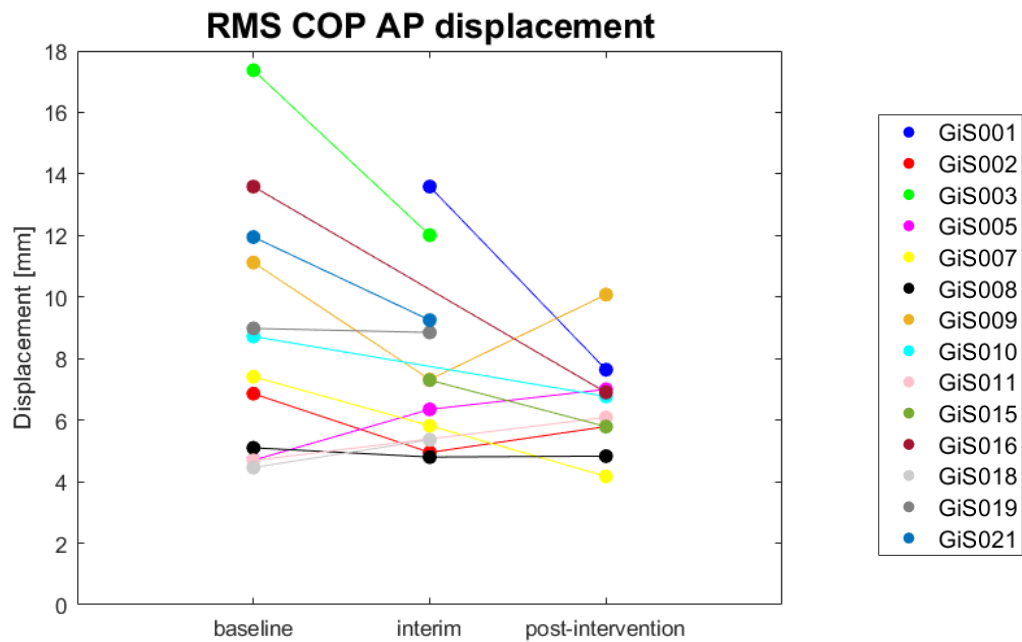


Figure 7: The RMS calculated for the sway in the antero-posterior direction is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

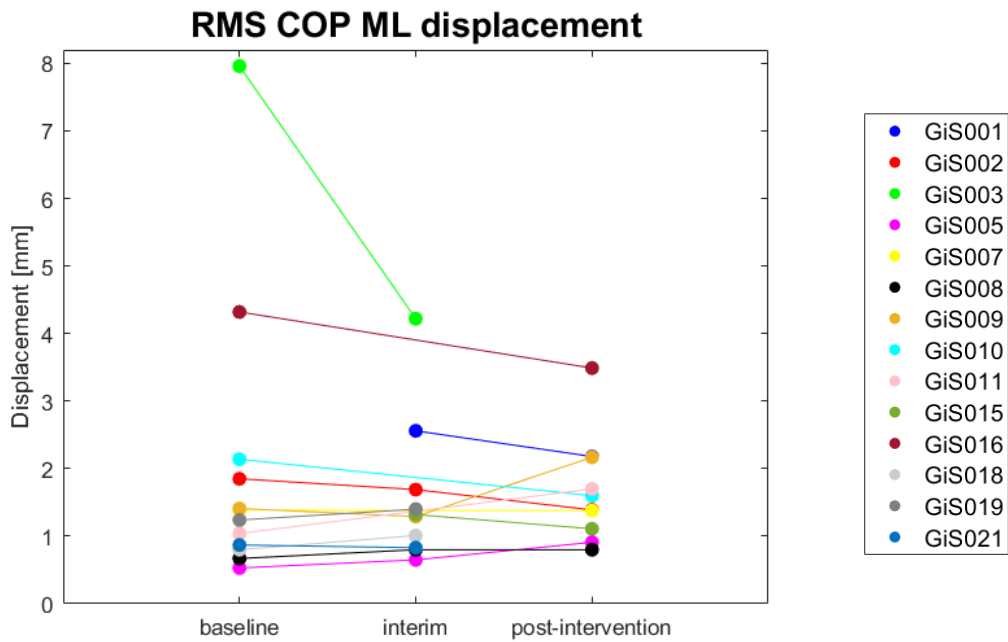


Figure 8: The RMS calculated for the sway in the medio-lateral direction is reported for each participant and each assessment attended. Each participant is represented with a different colour and the line connecting the results for following assessments highlights the increase or decrease in performance.

A clear trend of improvement for all participants related to the intervention was not detected as shown by the t-test and the results shown from figure 2 to 8. A wide range of participants took part to the study, with large variation in age, level of fitness, and cognitive impairment. In addition, factors such as illness during the 12-week period with hospital admission or additional physical activity undertaken outside of the golf sessions, influenced the results.

Although the physical impact strand of the study did not directly aim to explore the lived experience of the intervention, the brief health interviews conducted during each visit to the AWRC did capture an insight into expectations of and experiences associated with the intervention. These are summarised in Table 5.

**Table 5: Participant reported experience**

Participant code	Sex (M/F)	Age	Reported experience of intervention
GP001	M	83	This participant's verbal communication was limited, however, when prompted, his facial expressions indicated that he enjoyed the golf sessions and his care-giver shared the value of him being able to engage in a purposeful activity which reflected his lifelong interest.
GP002	M	89	This participant reported that he really looked forward to the golfing sessions. He shared that he had always 'been sporty' and enjoyed the competitive element. He and his wife had encouraged two of their friends (GP10/GP11) to join the project.
GP003	M	71	This participant's verbal communication was very limited. However, we observed that his confidence during his second visit to the AWRC increased and he was able to complete the physical tests more easily.
GP004			Deceased
GP005	F	93	This participant lived alone with an early diagnosis of dementia, her daughter attended the AWRC visits with her. She reported that she had always enjoyed an active lifestyle including hill walking and gardening. She had never played golf but was willing to 'give it a go.' During repeated visits she shared that she enjoyed the sessions, most of all when the weather was good and they could play outside.
GP006			Deceased
GP007	M	79	This participant shared that he had always loved sport and had been a semi-professional footballer as a young adult. However, since the COVID pandemic he had lost his confidence with physical activity and taken on caring responsibilities for his wife. Over the 12-week period of the project he recovered his physical confidence and started attending circuit training and joined a football team for older adults.
GP008	F	82	This participant resided in a nursing home and attended the AWRC with a paid care-giver. The participant had very limited short term memory and could not directly share her experience of attending the golf sessions. However, she enjoyed her visits to the AWRC and the care-giver reported that she loved 'keeping busy' and that the golf sessions plus visits to the AWRC satiated a need to be active for this participant.
GP009	M	82	This participant attended the AWRC with his wife. During his initial visit to the AWRC he expressed doubts about the golf programme and indicated that he was 'going along with it to keep everyone happy.' During subsequent visits he expressed great enjoyment of the sessions. He thought that the coaches, PT and OT were 'excellent' and that the sessions were a 'good laugh.'
GP010	M	85	GP010 and GP011 had been married for nearly 60-years and were both experiencing age-related health changes. There was not a distinct care-giver within the partnership, rather they reported that they helped each other depending on who was having the 'better day.' They had played golf in their younger years and valued the opportunity to resume the activity in an inclusive setting. They lived in sheltered accommodation and were neighbours with GP002 and his wife. The four people travelled together by taxi to the AWRC and the golfing sessions.
GP011	F	84	
GP012	F	73	GP012 and GP013 had been married for over 50-years. GP012 was experiencing physical health changes which caused her pain and reduced her mobility. GP013 was diagnosed with Alzheimer's Disease, although he reported that this diagnosis was incorrect and that any memory changes were due to an ion imbalance. They were keen to take up the golfing intervention together. Unfortunately they discontinued due to acute health problems at the start of the project, but reported they planned to return to Golf in Society at a later date.
GP013	M	74	
GP014	M	89	This participant had been a care-giver to his wife who had recently been admitted to a nursing home. He had a diagnosis of dementia but was able to live alone with support from his granddaughter who lived nearby. He attended the AWRC alone and reported that he enjoyed the golf and felt safe there.
GP015	F	90	This participant had recently moved to Sheffield to be close to her daughter following the death of her husband in 2022. During the first visit she was tearful and shared that she was taking part in the project to try to build a new life and help with medical research. During her subsequent visits she reported that she really looked forward to the golfing sessions and that the exercise had inspired her to start walking lengths of the corridor in her sheltered accommodation.
GP016	M	62	This participants lived with early onset dementia which had forced early retirement. He attended the AWRC with his wife. He was quiet during the sessions but shared that he enjoyed the golf.

GP017	F	81	This participant lived alone and was recovering from a recent episode of severe anxiety. She had been signposted to Golf in Society by a nurse. The participant shared that she had never been sporty and thought that golf was 'for posh folk.' However, she trusted that her nurse would have only recommend helpful ideas and was willing to 'give it a go.' During follow up visits she reported that she enjoyed the sessions and especially valued the advice from the PT and OT.
GP018	M	86	This participant lived with cognitive impairment and attended the AWRC with his wife. He appeared to enjoy performing the physical tests and his wife shared that he had always enjoyed competitive sport. She expressed gratitude for the Golf in Society offer as her husband enjoyed the sessions and she found peer support plus guidance from the OT helpful.
GP019	M	82	This participant was recently bereaved following the loss of his wife. He had had a stroke six-months earlier and felt that he had received very limited support from the NHS. He reported changes with movement on his right hand side and had self-initiated a daily schedule of walking and hand exercises. The Stroke Association had signposted him to the Golf in Society project. He reported that he enjoyed the sessions and had set new targets for his walking distance following advice from the PT at the golf project.
GP020	M	84	This participant was only able to attend the baseline assessment at the AWRC. His follow-up session was cancelled due to transport difficulties. He shared that his daughter had encouraged him to take part in the project.
GP021	M	68	This participant attended the AWRC on his own, although he reported that he was becoming increasingly dependent on his wife due to physical and cognitive changes associated with his Parkinson's Disease. His daughter was a physiotherapist and had recommended the project to him. During his follow up visit he shared that he had enjoyed the sessions more than he had expected to and planned to look into options for continuing with golf beyond the timescale of the project.

## Individual case analyses

Due to the heterogeneous nature of the study sample and individualised intervention, it was not anticipated that group analyses would detect clear trends or statistically significant results.

Four diverse participants have been selected to generate a narrative report of the physical measures recorded during the timescale of their engagement with the golfing intervention. Their incentives for participation and reported associated behaviours are summarised.

### Case 1:

GP007 was a 79-year-old male. He reported a history of cardiac symptoms which improved following x2 stents in 1999. He had completed cardiac rehabilitation and remained active in the years following this procedure. However, since the COVID-19 pandemic he reported a decline in his physical activity and has recently adopted a care-giving role for his wife who had become less independent. He had enjoyed golf as a younger adult and hoped that the project would help him to regain confidence to exercise. He attended the sessions alone and had no cognitive impairment.

**Table 6: Case 1 results**

Measure	Baseline	Interim	Post-intervention
30s sit to stand (reps)	10	12	14
Timed up and go (s)	9.93	8.57	7.85
10m walk test (s)	8.65	7.77	7.16
Hand grip R (kg)	32.4	32.6	30.4
Hand grip L (kg)	34.7	33.4	31.9
Medial-lateral sway (mm)	1.3	1.3	1.2
Anterio-post sway (mm)	7.5	6.0	4.2

The improved repeated sit to stand indicated an increase in leg strength, although grip strength declined over the 12-weeks. The decrease in sway and quicker TUG score suggests that his balance improved, and his gait speed also increased according to the 10MWT. He reported that he had enjoyed the sessions and that the advice from the PT and OT reassured him that exercise was safe and beneficial. He had taken up a weekly circuit training session at his sheltered accommodation and started walking to the local shops. It is therefore possible that the improved physical performance was partially attributable to engagement in additional activities. However, it was the golfing intervention combined with PT/OT which had given him the confidence to start circuit training and walking.

**Case 2:**

GP016 was a 62-year-old male with a history of cardiovascular disease and onset of vascular dementia in his mid-late 50's. This had caused him to take early retirement, and he was dependent on his wife who was his main care-giver. He had a high Body Mass Index and reported that he was an ex-smoker. His wife had encouraged him to take up the golfing intervention and he reported that he enjoyed the sessions.

**Table 7: Case 2 results**

Measure	Baseline	Interim	Post-intervention
30s sit to stand (reps)	8 (used hands)	No interim due to limited availability of care-giver	7 (no hands)
Timed up and go (s)	14.89		15.38
10m walk test (s)	12.40		11.0
Hand grip R (kg)	32.4		30.9
Hand grip L (kg)	30.8		28.1
Medial-lateral sway (mm)	4.5		3.6
Anterio-post sway (mm)	14.1		7.5

The reduced postural sway combined with the ability to perform sit to stand without using his arms during the second visit may have indicated improved balance. However, the TUG test is validated as a measure of balance and there was a marginal decline in performance. Overall, the repeated measurements indicated a stable physical status. The results for the TUG, 10MWT and sit to stand tests were much lower than average for his age and reflect the impact of early onset vascular dementia on physical wellbeing.

### Case 3:

GP015 was a 90-year-old female who had recently moved to Sheffield following the death of her husband during the previous year. She lived in sheltered accommodation with her daughter nearby. She reported a 3-year history of Parkinson's Disease. Her incentives for joining the project were to meet people and help with research for older adults. She was tearful during her baseline visit and explained that she was still grieving the loss of her husband.

**Table 8: Case 3 results**

Measure	Baseline	Interim	Post-intervention
30s sit to stand (reps)	6 (used hands)	6 (used hands)	6 (used hands)
Timed up and go (s)	30.95	28.54	23.2
10m walk test (s)	13.56	15.68	14.94
Hand grip R (kg)	16.4	14.5	15.4
Hand grip L (kg)	11.1	10.5	11.4
Medial-lateral sway (mm)	1.2	1.3	1.2
Anterio-post sway (mm)	11.2	7.5	6.3

The results indicate a clinically important improvement in TUG performance and the reduced postural sway suggests improved balance associated with the intervention. Interestingly the 10MWT did not show a consistent trend. GP015 reported that she enjoyed taking part in the project and that following the advice of the PT, she was walking lengths of the corridor in her sheltered accommodation as part of a daily routine to maintain physical wellbeing. We observed that her physical confidence appeared to improve over the course of the visits.

### Case 4:

GP008 was an 82-year-old female with a diagnosis of Alzheimer's Disease. She lived in a Nursing Home following the death of her husband who had been her main care-giver. She attended the sessions with a health care assistant. She had difficulty processing the verbal and visual prompts to complete the tests during her visits to the AWRC. However, she reported that she enjoyed the visits and the golf sessions.

**Table 9: Case 4 results**

Measure	Baseline	Interim	Post-intervention
30s sit to stand (reps)	7	14	11
Timed up and go (s)	11.71	13.09	9.72
10m walk test (s)	10.84	7.17	8.03
Hand grip R (kg)	10.5	13.9	17.2
Hand grip L (kg)	10.7	8.9	10.6
Medial-lateral sway (mm)	0.6	0.7	0.7
Anterio-post sway (mm)	5.4	4.2	4.3

The results indicate improved mobility and strength potentially associated with the intervention.

## **CARE-GIVER/SERVICE PROVIDER EXPERIENCE: METHODS**

### **QUALITATIVE**

Qualitative research was conducted with caregivers, participants and service providers, to explore perspectives around both the process (what works, why, lessons learned), and impact of the programme (for the participants and carers). This included:

- Seven interviews with caregivers and participants (covering seven care-givers, two participants)
- Six interviews with delivery staff

These interviews were conducted towards the end of the programme, so that people could reflect on their experiences of the intervention.

#### **Caregiver and participant interviews**

Interviews with caregivers and participants were conducted in person at visits to two Golf in Society sessions during week 10 of the intervention. The format of the Golf in Society sessions is that whilst the participants are involved in the golf intervention, the care-givers have some free time and usually sit and wait in the clubhouse / café area. We organised short interviews during this time whilst the care-givers did not have their caring responsibility and had time to participate in an interview. For two of these interviews, the participants also joined in the interview alongside their caregiver. Each interview lasted on average 30 minutes, and covered experiences of the Golf in Society programme, including what works and feedback from care-givers on the programme and what the impacts have been for the person they care for, and for themselves. It should be noted that, whilst these interviews were designed to be conducted towards the end of the programme, as people had joined at slightly different timepoints, for some this was week 10 of delivery, but a few others had not been attending the sessions for quite as long.

#### **Service provider interviews**

Interviews with a range of service providers included the two Occupational Therapists that were regularly involved in the programme, three student Occupational Therapists who were undertaking an eight-week placement with Golf in Society, and one staff member who was previously a volunteer Golf Activator but had transitioned to a paid role with responsibility for promotion and recruitment of participants. The original plan had also been to interview the Physiotherapist that had been engaged in the programme, but due to her leaving the programme part-way through, it was unfortunately not possible to organise this. Nevertheless, insight was gathered in the interviews with other service providers as well as care-givers, on the impact of the Physiotherapist's involvement in the programme. The service provider interviews were conducted during the visits to the two Golf in Society

sessions towards the end of the programme in week 10, lasted on average around 30 minutes, and covered questions around what had worked well, what had not worked, lessons learned, and other reflections on the delivery of the programme.

### **Data analysis**

Each interview was recorded and subsequently transcribed by the research team. Transcriptions from the interviews were then transferred into Microsoft Excel for content analysis to highlight key themes. The results section later consolidates the insight gathered from the perspectives of all that were interviewed, with the use of sample quotations throughout to help illustrate the points made.

### **QUANTITATIVE**

An online survey was distributed to all caregivers involved in the programme at three different timepoints: baseline (the start of their engagement with Golf in Society), halfway through the programme, and the endpoint of the programme. The surveys were administered by programme staff at the AWRC.

The online surveys were designed to better understand care-givers' reasons for engaging with Golf in Society, their physical activity levels as caregivers, their mental, individual and social development and wellbeing, including levels of loneliness and their quality of life, and finally their overall experience of the Golf in Society programme.

### **Demographics**

In total, eight participants completed at least one survey. Four participants completed all three surveys, three participants completed the baseline survey only, whilst one participant completed the midpoint and end of programme survey yet did not complete the baseline survey. In terms of demographic breakdown, 100% (n=8) of respondents were female, whilst 86% (n=6) described their ethnic group or background as White.

The majority, 71% (n=5), indicated that the person they care for lived with dementia, 43% (n=3) said their partner lived with a diagnosis of Parkinson's Disease, whilst one care-giver indicated the person they care for lived with depression, and one care-giver indicated the person they care for was lonely.

All respondents (n=8) stated that the physical and/or cognitive impairments outlined above had a substantial effect on the ability of the person they care for to engage in normal daily activities. This therefore means care-givers are required to provide significant support, with care-giver survey respondents (n=6) on average having less than 5 hours a week (4.7 hours) to do something that is just for them.

It should be noted that the survey was designed to be completed by care-givers, based on previous research undertaken with Golf in Society, where caregivers were often the husband or wife of the participant and bringing them to the sessions. In this study, however, there were some differences in the relationships of those attending the sessions. For

example, there were some people bringing a parent to the sessions, and these were people who did not officially have a caring role for their parent. There were also some examples where the care-giver also joined in the sessions alongside the participant. As a result, for some people, the survey questions were not fully applicable, and therefore responses to the survey were low. If this had been anticipated, the survey could have been designed to be completed by a wider range of people, and this would be recommended for future research to ensure higher completion rates.

## **CARE-GIVER/PARTICIPANT/SERVICE PROVIDER EXPERIENCE: RESULTS**

### **Caregiver and participant interviews**

This section outlines the results of the interviews with both the caregivers and participants of Golf in Society.

#### **Motivations and expectations**

Several of the carers and participants had first heard about Golf in Society through word of mouth, either from another care-giver that had been bringing the person that they care for, or who had heard about the sessions and mentioned them. Some had seen promotional materials including leaflets advertising the programme.

Most of the participants had played golf previously and there was either a desire to get back into golf, or to sustain participation, or it was felt by their carers that, due to previous experience, this would be something that they would enjoy.

*We are ex-golfers for a start. So anything with the word 'golf' in it. That's what made me pick up the leaflet, I saw it said 'golf'. I know golf and the benefits it can have so I thought to myself 'socially it would be good, physically it would be good, mentally it would be good'. Because golf keeps your mind working, it keeps you involved. (Care-giver)*

*He's lost all self-worth, concentration, motivation. Because everything he loved, which is sport and to go down to golf, has gone. Playing golf has been taken away from him, so I just thought this was ideal. (Care-giver)*

For some, it was not necessarily the golf but more a desire to do something active that appealed.

*It fills your time in so you aren't sitting moping. And it is very easy to give up. When you get old, it is so easy to do that. (Participant)*

*And when we heard of this we didn't quite know, 'why golf? What difference would golf have?' But we thought we would try it and see. It might have been football, it might have been cricket or so on. And I suppose all of those might have had an impact because if you are kicking a ball or hitting a ball or whatever, I suppose they*

*would have health benefits. It might have had the same health impact, it's still hand eye coordination. But I know Golf in Society has been going for quite a while and has been working with people with disabilities and illnesses for a while. So they have that experience, they are well established. So would a different sport have the same social benefits I don't know, would it attract the same people? (Care-giver)*

One interviewee had brought her parents to the session, and her father was participating in the sessions, whilst she thought the sessions may also have a social benefit for her mother too.

*Because of the nature of dad's age and the friends and the pandemic, social life is really narrowed. It's difficult for my mum because she won't leave my dad. So, I'm very hopeful that my mum will enjoy it and hopefully meet with the other ladies or whatever and will chat. (Caregiver)*

## Impacts

Interviewees were asked whether or not Golf in Society had met their expectations. There was a general consensus that it had either met or surpassed expectations. Both participants and care-givers described positive outcomes, and that there had been some unexpected benefits too. There was generally an acknowledgement of the physical health benefits for the participants in terms of increased walking, getting fresh air, building strength and balance and improving hand eye coordination, although the care-givers spoke much more about the wellbeing and social benefits for both themselves as carers, and for the participants they had brought to the sessions.

Example comments around the wellbeing and social impacts for participants include:

*But it's nice to know that when he is here, he is doing something fun for him, and I don't have that guilt about leaving him then. And he is doing it without me as well, which is good for him. Because everything else that he does he has to do with me. So, he needs that bit of independence from me. He can do this without me. (Care-giver)*

*It is keeping him as him for longer. It is preserving his mental state. This is the alternative to letting them sink into oblivion, then you've got a body in a hospital or in a home, but that is so much more expensive than giving a grant to Golf in Society and helping them keep going for so much longer. It is financially I would guess, the much better option. (Care-giver)*

*I think it's really nice for him that he gets that social time with other men his age too. The rest of the week, he is stuck with me, it's nice for him to reconnect with people similar to himself. (Care-giver).*

Comments around the impacts for caregivers include:

*I think it's the fact that even though I'm with [name of participant], I've made friends as well, whether it's other people who are involved in it, or whether it's their partner,*

*you know? Vascular dementia, it can be a very isolating disease as much for the carer as the patient. Sometimes you feel you think you're the only one going through this and that, you know, some days it gets very frustrating for both of us. (Care-giver)*

*It's also helping me because if he's happier, I'm happier. And if I'm happy, he's happy. That's how it works. (Care-giver)*

*I feel it is treating me as well. As a carer you do get depressed. You do get down. And you get tired, because you are a carer 24/7. So I think this treats carers as well. I feel better when I've been. It's a break for me, it's chance to meet other people, and I like joining in for me too. (Care-giver)*

*It's always been the one real high point in the week [attending the GiS session] where I know that's going to be fine and I'm going to feel that benefit for both of us. (Care-giver)*

## **What works**

There were comments on the delivery of the sessions and the aspects that people saw as valuable. In particular, there were several comments on the warm-up, which both the carers and participants joined in with at the start of the session.

*Well, I think the warm up is very important. Getting you to use all of your limbs. I have got a problem on the one side with my left arm. So, I have found it a bit difficult at times, but it's been very useful. Excellent. (Participant)*

*It's been fantastic on all kinds of levels. the physiotherapy bit at the beginning is a really lovely participation bit again. I think he feels that he's actually joining that even though he might not get all the moves right. He's still doing it at his level, and he feels as if he's comfortable. (Care-giver)*

*What you saw us doing as the warm up in here with the ball. That was nothing to do with us having disabilities or illnesses, it was all about having fun. And forgetting why we are here, just doing something enjoyable. When you get old, you can have fun and enjoy yourselves. Before you get to that age you have to be more respectable. But when you get old you want to let go and have some fun. (Care-giver)*

*I think they adapt everything really well. I think they're very good at doing an assessment of people's abilities, and I think the engagement where they're all doing the same thing, but at their own level, you know, proper differentiation is just great so everybody can join in, everybody's part of the group, and I think that's really important. (Care-giver)*

In addition, the support provided by delivery staff including the Occupational Therapists and the Physiotherapist was frequently mentioned, particularly in giving care-givers confidence that the person they cared for was supported and in safe hands.

*They've helped with some of the little things that are needed. [name of participant] has hearing problems, and if there is any noise in the background, music playing etc, he struggles. It might be just on but it is difficult. When we first came and the music was on, he couldn't hear a word. So [name of Occupational Therapist] sorted it straight away. So having the OTs has made a real difference. (Caregiver)*

*I think if you only had the golf professionals here, whilst they are absolutely fantastic at what they do, they wouldn't be able to provide that one-to-one attention and support. Whereas, as it currently is, the staff they have got are enough to mean that it is pretty much one-to-one, I know that walking in and out here is someone to support. Because you have to have the confidence to walk away, and knowing that he is supported, he is being looked after, enables you to do that. (Caregiver)*

*And the physio, she was excellent. She took the time to talk to us, she gave him some exercises to do at home, and they have really helped him. (Care-giver)*

*They are really, really well skilled, welcoming, friendly. They're a great, great group, aren't they? Absolutely everything that you could possibly want. But they make everything fun, and you know that that's a real skill. (Caregiver)*

## **Recommendations**

None of the caregivers or participants that were interviewed had any recommendations for changes to the programme, and all had extremely positive feedback. As an example:

*I can't think of anything that they could do that could improve it because we find everything enjoyable and we love it. (Caregiver)*

There were several comments from caregivers and participants that they were hoping that the sessions would continue, or that they would become available in another venue. Some people needed to travel some distance to the sessions, and whilst their enjoyment of the sessions, and the benefits gained, meant that they did not mind the journey, they did express hope that a golf club closer to home might begin sessions in the future.

## **Service provider interviews**

This section outlines the results from the interviews with those involved in the delivery of the Golf in Society programme.

### **Occupational Therapy involvement**

There was an agreement that Occupational Therapist (OT) involvement was important and valuable to the intervention and had a key role in delivery, working with the participants to ensure that they were able to participate, and able to experience benefits from their participation. The OTs explored with individuals their specific condition, their specific needs,

and discussed this with the coaches and volunteers to develop plans to enable people to be able to participate.

*In terms of the OT role, it's that dynamic assessment of individual need and then drawing it together to help those facilitating the session to be able to do something where everyone feels able to participate and welcome. (OT)*

*The one-to-one time with participants, exploring how people are participating and following the sessions, is there anything that needs to be put in place to ensure that people are able to engage, so all the OT practice you would expect to find. And that has been very much applied to the dynamics in the groups, based on the initial assessments we've done, the feedback we're getting from the participants. (OT)*

*It is key that you are able to observe, that you have good observational skills, because often your assessments are quite dynamic. It's not sitting down to do formal assessments, it's not structured like that, in a formal setting like in a healthcare setting. (Student OT)*

As well as enabling participants to be able to participate in the golf, the OTs saw their role as key in enabling the environment and space for both participants and carers to also have social time and build connections.

*And it is also valuing the downtime as well. We want to provide space in which people can connect with each other and feel like they belong to something. So I think that is something for which you need personal skills on group facilitation and communication. And it is the crux of the OT role here. (OT)*

The student OTs valued the opportunity to work with Golf in Society as this gave them experience and an ability to apply their OT skills in a non-traditional setting, and working with the participants over a period of time was valuable to them.

*It depends on the setting, but a lot of the time [in a clinical setting] you might see someone once and that's it, then they are gone, and you don't get to follow up with them, you don't get to build a relationship with them. It's really hard to build a really good relationship. So here, we get more time, and there's enough of us that we have the ability to have one on one time with them which is great. (Student OT)*

*Being able to have the relationship with a small group of participants, you get to see their development and the impact that it is having on them, because you don't get that follow up in other settings, whereas you see the impacts here so that's really valuable. (Student OT)*

### **Success factors**

When asked about the factors important to the successful delivery of the programme, there was an agreement that flexibility and ability to adapt to different situations was important. When bad weather had been a challenge, having space indoors to be able to bring the golf

activities indoors was important, as well as the ability of the coaches to design innovative activities to enable participation to continue indoors.

*A big part is that ability to adapt, to bring in new practices, which really redefine what golf is and what it can be, and to adapt to the space. (OT)*

The OT involvement was also a part of this, to look at and understand the barriers that people might face in the different spaces in and around the golf club and put things in place to mitigate these. For example, part of the clubhouse was carpeted, and the carpets had an affect on visual processing for some participants. The OTs recognised this, and the indoor activities were moved to a part of the clubhouse with wooden floors.

*I think it is about adaptation to space and adapting the game to suit and give a challenge to everybody. It's a very versatile sport, and you can really see how Golf in Society can apply it to a lot of different settings, and apply the learning from here to a lot of different settings. (OT)*

A further success factor was around the promotion of Golf in Society and changing perceptions. This encompassed promoting, firstly, golf itself to people who would not previously have considered golf to be something that they either could participate in, or wanted to participate in, and secondly, raising awareness of conditions, and developing understanding that people with cognitive decline can still participate in golf activities.

*I've been just trying to get the message out there, we've been pushing it across the city, we've done numerous leaflet drops, we've spoken to local organisations. It's engaging people who have played golf in the past, and maybe thought they would never be able to play again, or maybe people who had wanted to give it a go, but also those who just didn't think it was for them. But often people have the perception of golf that it is a sport for some people but not for everybody. So it's been getting the message out there that this is something for everyone and encouraging them to give it a try. (Recruitment lead)*

*People [members of the golf club] are talking more openly about the work that we are doing, they are interested, they can recommend us, recommend people that they might refer into the project. So I think it opens up discussion about people's conditions, raises awareness, and opens up the space, there has been a social change I would say amongst the members. We have seen a social and environmental shift in this hub which is very positive. (OT)*

## Challenges

Whilst there was agreement that there had been success in the promotion of the message and values of Golf in Society, changing some people's perceptions, and that the programme had successfully engaged participants who may have either not believed that they could participate in golf, or not believed that golf was something for them, there was acknowledgment that recruitment to the programme had been difficult. The number of

participants joining the programme had been fewer than the original targets. It was acknowledged that the timeframe for recruitment was short, and promoting and recruiting participants was a time-consuming role. This had improved, however, part way through the programme with the recruitment of the member of staff specifically responsible for promotion and recruitment, meaning that even towards the end of the programme, new participants were still coming through for taster sessions.

There was a further challenge in reaching specific target groups. The recruitment lead had tried to engage ethnic minority groups through Voluntary Community Social Enterprise (VCSE) organisations in the city, but this had been a challenge due to a variety of factors including lack of time, the need for translators for those that did not speak English, and potentially pre-existing perceptions around golf which were difficult to overcome in the timeframe. It was suggested that a recruitment strategy at the outset of the programme would have been beneficial to ensure the best approaches are developed and used to target certain demographics.

*I would need more preparation for specific groups like that. I didn't realise that there would be so many challenges. I just thought I was offering them a really good opportunity and I thought I would just go in and offer them a session and they would take it. I didn't expect the barriers. So that needs more thought, how to engage with these groups. It was obstacle on obstacle. So next time having more of an idea on what needed to be in place, instead of learning as I went along. (Recruitment lead)*

*For future research projects a recruitment strategy should come first, and I think a bit more exploration on social perceptions on golf, I think if we had more understanding on that we would know a bit more about what direction the recruitment should come from, how to frame it. (OT)*

It was also, however, acknowledged that, had the target numbers of participants been recruited, there would have been a significant challenge in the delivery of sessions as there would be less one-to-one time between staff and participants, which may have had a detrimental impact to the relationships that were able to be developed and the individual support provided to participants.

A further challenge was a pressure on the OT role to undertake administrative duties which took time away from being able to concentrate on the OT side of delivery and engagement. One of the OTs spent a considerable amount of time booking taxis for the participants. Whilst booking taxis was key to ensuring people were able to get to and from sessions enabling them to participate, a large amount of time spent doing duties like this took place during the sessions and during the social time, which took the OT away from being able to deal with and communicate with the participants. It was suggested that having a dedicated administrator to undertake these types of duties would have been beneficial, along with greater clarity on roles and responsibilities for all involved, including students and volunteers.

Finally, the time-limit of the study was a challenge. Because there were so many positive impacts for the participants and their carers, towards the end there was some ambiguity in

terms of whether they would be able to continue longer-term. New participants were joining the programme and having taster sessions even on week 10 and 11 of the programme. Whilst they were likely to have had some enjoyment and further benefits from participating in a one-off session, there was a lack of clarity in what they could be offered on a longer-term basis.

## Impacts

There was a consensus that the programme had huge benefits for both participants and carers in terms of physical health, wellbeing, and reducing social isolation, and in the interviews numerous examples were given of the benefits for particular individuals that staff had observed.

*I don't think I expected it to be as effective as it has been. It's quite transformative and you can really see that with some of the people that have come through and their perceptions of their abilities have really shifted. In that sense it has been really eye opening I suppose. That and also that these spaces, these golf clubs which do have a historic sense of elitism, can actually be really open. (OT)*

*One of the huge benefits of this intervention is that it can reduce the social isolation that comes with disability and illness. (OT)*

*I think the things that are really valuable in terms of this research project and Golf in Society is that it has clearly identified a need in terms of the inaccessibility of physical activity for people at the lower end of the social gradient. I think it's amazing that Golf in Society is working toward that aim and reducing health inequalities. (OT)*

*But not only are they socialising with us, but they are building relationships with other people who are in the same position as them too. And that's something you wouldn't get in a clinical setting. This isn't just a research programme that everyone is taking part in, it's something deeper than that. (Student OT)*

It was also described that the impact of the programme on participants can be witnessed during the timeframe of just one session.

*You see them change through the course of the session too. Maybe at the start when they arrive they are quiet, less responsive, and then towards the end of the session you see them come alive, just in the warm ups, you see the change in them, and as the session goes on, you see people progress. And I honestly would have never believed you could witness something like that in just two hours. (Student OT)*

*I don't know how to describe it, but you see people come alive and it's like...it's like glowing embers in a fireplace. You know when the fire is just starting to go down, and you just blow on it and it sparks up again, maybe it doesn't quite become a big roaring fire again, but the heat starts to build back up. (Student OT)*

In addition, the interviewees described the personal benefits that they had found themselves from working on the programme, including how rewarding it was to be involved in delivering the sessions and having a role in making a difference to people's lives.

*I think just seeing people come and get pleasure from it. I get pleasure from that. Because I've worked with some people with quite serious mental health conditions, whereas here what we are doing is preventing that, improving people's wellbeing and making them feel good. And seeing people get enjoyment rubs off on you as well. It doesn't feel like work. (Recruitment lead)*

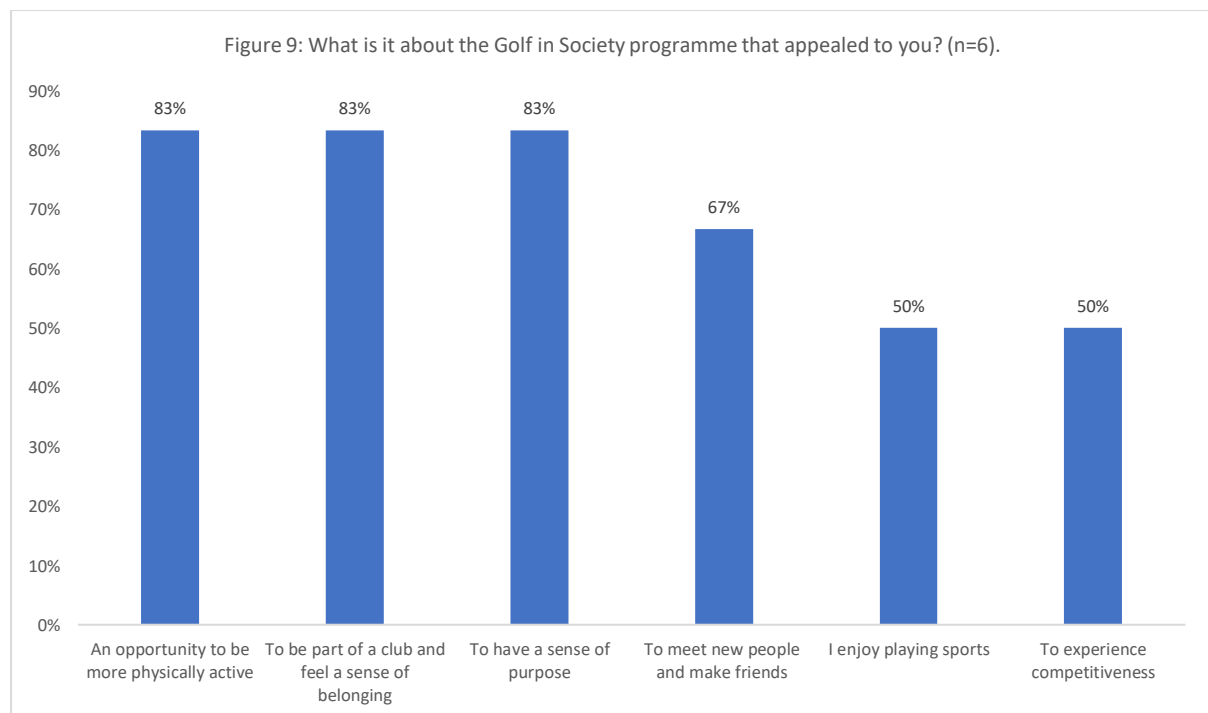
*We are on site only two days a week but even from that you get to know people so well, and you learn so much. You don't realise it whilst you are doing it but then afterwards when you discuss the day [with the other OTs] you realise what you've learnt just in that time. So it's a great learning experience for us as future OTs. (Student OT)*

## Quantitative research

This section describes the results of the online survey that was distributed to care-givers at the baseline, midpoint, and end of the programme.

### Reasons for joining Golf in Society

Care-givers were asked what it was about Golf in Society that appealed to them, with the feedback highlighted in Figure 9. An opportunity to be physically active, to feel a sense of belonging, and to have a sense of purpose were the top three most cited answers.



Additionally, care-givers were asked in the survey to comment on what they hoped to get out of the programme, both from the perspective of the person they care for, and also themselves as carers. Qualitative feedback suggests that they hoped the person they care for would engage and enjoy the programme, whilst benefitting physically, mentally and socially. Example feedback has been highlighted below:

*To be able to participate in the game he loves, for as long as possible. Enjoy some social interaction (at his level) with people who share his passion. Slow his physical and mental deterioration. Improve his stability and flexibility so he can enjoy his life more. (Caregiver)*

*Social interaction with other males. An improvement in his balance. Something to look forward to every week. The opportunity to learn a skill in a safe environment when I'm not there too, with the input of occupational therapy and physiotherapy if needed. (Care-giver)*

*To ensure that he engages in activities with people with similar medical needs and socialising. Also gives an opportunity to interact with like-minded people with dementia/disabilities who are on a similar journey. (Caregiver)*

Care-givers themselves hoped to have the pleasure of watching the person they care for enjoying themselves, whilst it was also cited as both a great opportunity for them to receive support and to be able to engage and socialise with other carers.

*The pleasure of seeing him happy. (Caregiver)*

*Maybe meet other caregivers like me. It's also really good to have time to myself in the middle of the day knowing that my husband is ok. (Caregiver)*

*Be able to interact with carers and exchange experiences that we go through which helps in adapting to situations that arise. The social aspect is pleasurable, and it is a learning curve for all concerned in dealing with this difficult experience. (Care-giver)*

### **Physical activity levels**

Physical activity was assessed using Sport England's Single Item Metric (SIM) administered within the three surveys. The SIM asks the question 'In the past week, on how many days have you done a total of 30 mins or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise and brisk walking or cycling for recreation or to get to and from places but should not include housework or physical activity that is part of your job.'

Only four respondents completed the SIM for all three surveys, whilst one respondent completed the SIM for surveys two and three.

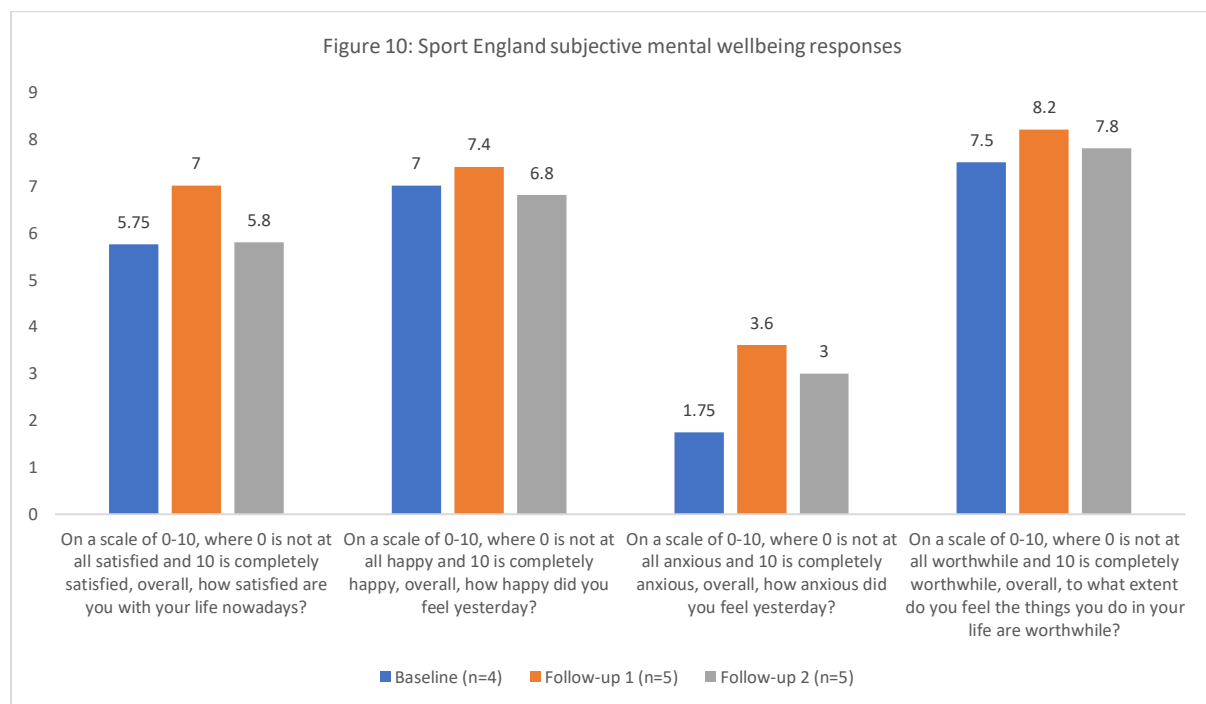
The mean number of reported days of physical activity using the SIM for each respective survey (baseline, follow-up 1, and follow-up 2) were: 1.5, 2.4 and 2.8. The low response rate prevents detailed analysis of the data but does provided a crude indication of increased

participation over the duration of the programme, with reported physical activity at follow-up survey two almost double that of the baseline survey.

## Mental wellbeing

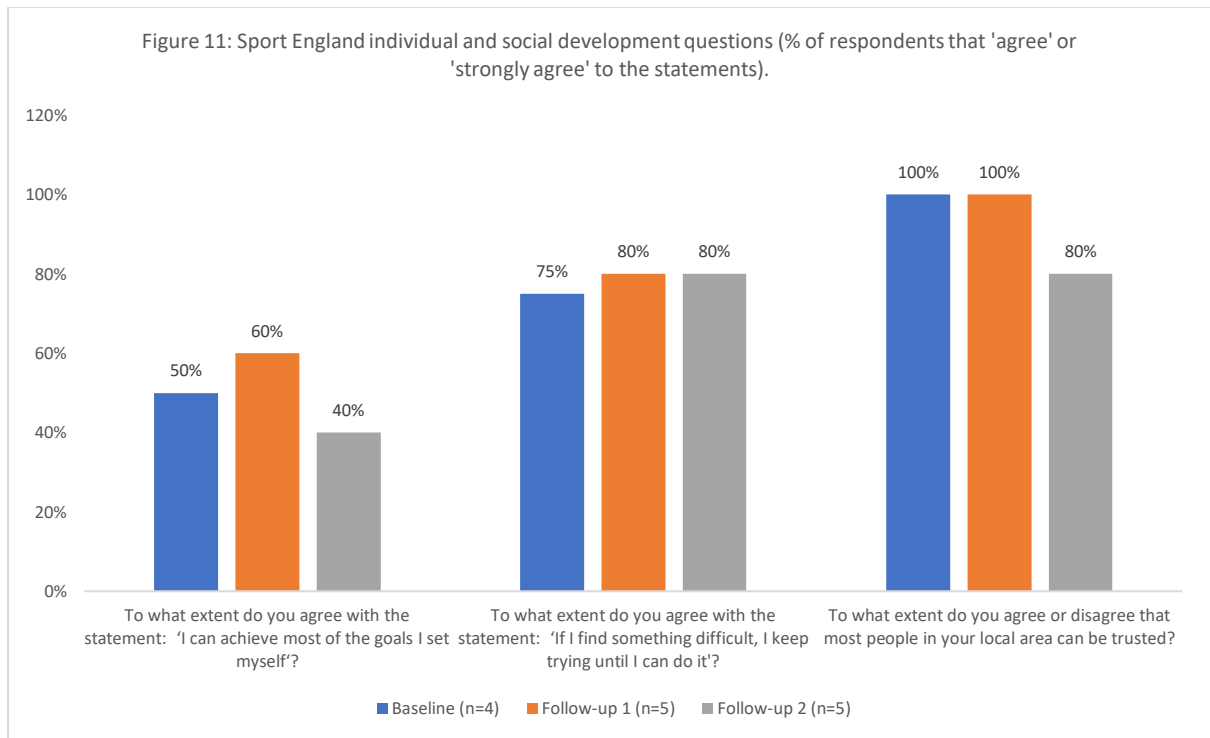
To assess mental wellbeing, Sport England’s subjective mental wellbeing questions were used across all three surveys. These questions focus on life satisfaction, happiness, anxiety, and how worthwhile they feel the things they do in life are.

Figure 9 below shows the average scores from across the three surveys. Again, the low response rate prevents detailed analysis of the data, however what the results do show is that the average scores remained similar across the different time points, with respondents indicating medium to high levels of life satisfaction and happiness, low levels of anxiety, and a high belief that the things they do in life are worthwhile. Interestingly, across all four areas, responses peaked at the midpoint of the programme, i.e. follow-up 1 survey.



## Individual and social development

Individual development (self-efficacy) and social and community development (social trust) were measured by asking carers three questions from the Sport England Adult Question Bank. The questions focus on achieving goals, resilience, and community trust. Similar to mental wellbeing, Figure 11 shows that results remained similar across all three surveys, with respondents showing high levels of both trust in others and resilience, whilst on average 50% of respondents agree they can achieve the goals they set themselves.



## Quality of life and loneliness

In order to assess perceived quality of life, care-givers were asked to what extent do they agree or disagree that the Golf in Society programme improved the overall quality of life for a) them as a care-giver, and b) the person they care for. In both instances, responses were unanimously positive, with 100% of caregivers (n=5) 'agreeing' or 'strongly agreeing' that the programme had improved the lives of both caregivers and participants.

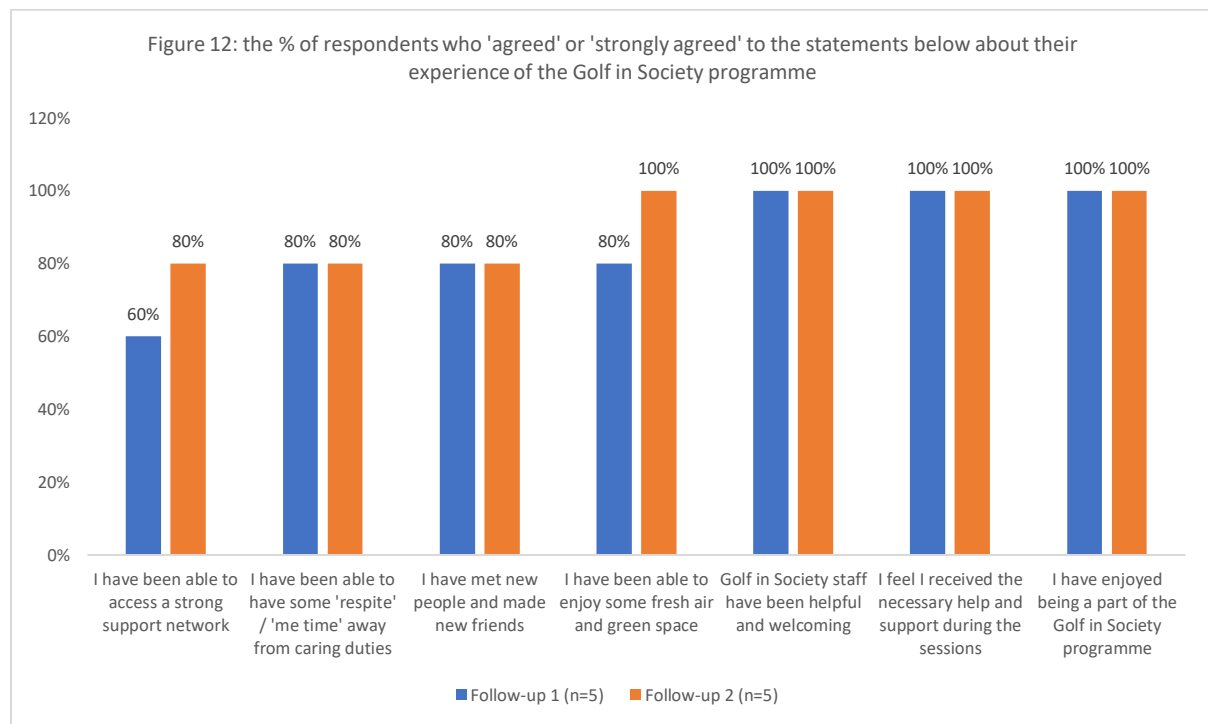
In order to evaluate loneliness, the UCLA 3-Item Loneliness Scale was used. The scale comprises of three questions that measure three dimensions of loneliness: relational connectedness, social connectedness, and self-perceived social isolation. The questions are:

- How often do you feel that you lack companionship?
- How often do you feel left out? and
- How often do you feel isolated from others?

Respondents then provided a rating of 'hardly ever' (1 point), 'some of the time' (2 points), or 'often' (3 points), thus providing a total score ranging from 3-9. Scores of 3-5 are classed as 'not lonely', whilst scores of 6-9 mean an individual is classed as 'lonely'. Levels of loneliness did fluctuate across the course of the programme, with 60% of respondents indicating that at least at one time point that they felt lonely. In total, at baseline (n=4) 50% of respondents were classed as 'lonely', this decreased to only 20% at the midpoint (follow-up 1, n=5), but increased to 60% at the follow-up 2 stage (n=5). However, it should be noted that no single overall respondent score was higher than 7, indicating that all respondents with a score higher than 6 were very much at the lower end of the scale perceived lonely category.

## Caregivers' experience of Golf in Society

Care-givers were asked to provide feedback on their overall experience of the Golf in Society programme at both the midpoint (follow-up 1) and end of programme survey (follow-up 2). At both survey points, the feedback was overwhelmingly positive. As Figure 12 below demonstrates, respondents felt supported, able to make new friends, and like they could enjoy themselves and get some respite away from their carer responsibilities, whilst they also felt the Golf in Society staff have been helpful and welcoming.



Caregivers were also asked to state whether they felt things had improved for both themselves and also the person they care for as a result of the programme (figure 13). In all but one case (participant independence) there were greater improvements witnessed at the end of programme (follow-up 2 survey point) in comparison to the midpoint (follow-up 1 survey). It is also important to note that in all instances the remaining respondents who did not cite an improvement suggested that the different elements in Figure 5 had 'stayed the same', i.e. no noticeable improvement but things had not worsened as a result of the programme.

Figure 13: % of respondents who said the following areas have got 'better' or 'much better' as a result of Golf in Society	% of carers who said things have improved for <u>them</u> as a result of Golf in Society		% of carers who said things have improved for <u>the person they care for</u> as a result of Golf in Society	
	Follow-up 1 (n=5)	Follow-up 2 (n=5)	Follow-up 1 (n=5)	Follow-up 2 (n=5)
Their confidence	20%	20%	60%	60%
Their happiness	40%	60%	80%	80%
Relationships with others	40%	60%	20%	20%
Their physical health	20%	20%	60%	60%
Their mental health	20%	20%	80%	80%
Feelings of loneliness / isolation	40%	60%	60%	60%
Their independence	20%	40%	40%	20%

## DISCUSSION OF RESULTS

### Physical impact

The underpinning objectives which comprised recruitment of eligible participants and measurement of strength, balance and mobility were attained. However, the heterogenous nature of the sample, challenges associated with the measurement schedule and delivery of a non-standardised intervention limited the extent to which firm conclusions regarding physical impact can be drawn.

#### *Participant pathway*

The participants reported that the experience of visiting the golf club for a familiarisation visit followed by the visit to the AWRC for consent and baseline measurements was disjointed. Participants and care-givers reported that travelling to the separate locations added to the burden of taking part in the project. However, following the initial concerns associated with travelling to the AWRC, participants and their accompanying caregivers reported that they enjoyed visiting the centre and were impressed by its facilities and friendly staff.

It was planned that measurements would be taken at baseline, six weeks and twelve weeks to detect changes at the interim and end point of the intervention. Due to challenges associated with caregiver availability, transport and illness it was not possible to achieve this schedule for most participants. In addition, there was a recruitment surge during the final 10-weeks of the project which meant that we needed to adjust the measurement schedule to this shorter timeframe.

Seventeen of the twenty-one participants who were recruited to the project completed the intervention. GP020 was not able to attend a follow-up measurement session due to problems with transport. The reasons for dropping out of the project were mortality (GP004/GP006) and illness (GP012/GP013). The pre-test conversation focussed on health history enabled the research team to gain essential information about co-morbidities and ensure safe implementation of the physical measurements. During follow-up measurement sessions the health information was checked and this was when participants revealed

additional information about new health behaviours, for example uptake of circuit training by GP007.

### *Physical performance*

The measurement of physical performance generated a diverse dataset. Analysis of individual results in the context of medical history provided a more meaningful representation of physical ability and change over time than aggregated calculation of overall effect. The inclusion criteria were broad to reflect the inclusive ethos of Golf in Society. Within the heterogeneous sample there were participants with progressive conditions, for example, Parkinson's Disease, alongside participants with recovering or stable diagnoses. A case series methodology is recommended for future research projects focussed on this intervention to enable more in-depth analysis of individual responses to the intervention.

A further challenge associated with quantitative measurement of intervention impact within this project was the individualised experience delivered by the therapy team and golf coaches. The intervention was standardised insofar as the location and delivery team members were consistent; however, the physical components of the project were adapted to the cognitive and physical needs of each individual.

Additionally, compounding variables were not controlled meaning that participants had the freedom to either start or terminate other forms of exercise or activity during the 12-week period. The use of wearable devices would have enabled the research team to record and analyse physical activity patterns during the 12-week project which would corroborate the self-reported information about uptake of new activities.

It was not possible to attribute specific changes in physical performance to the therapy interventions or golf coaching. The added value and impact of the OT/PT input could be examined through a randomised study in which participants are allocated to either golf or golf plus OT/PT. However, due to the challenges associated with extraneous variables the validity of such a study would be questionable.

### **Recommendations**

The following recommendations are based on the reported findings and are intended to guide implementation and scaling of Golf in Society and inform the methodological approaches for future research.

- Physical measurements should be conducted in a dedicated space within or adjacent to the golf club venue.
- Measurement schedule should be tailored to individual goals and circumstances.
- The TUG, repeated sit to stand and hand grip dynamometry test are recommended for venue-based implementation as they do not require a specialist/large space and detect changes in strength, mobility and balance.

- A case series methodology is recommended for future mixed method research projects focussed on the golfing intervention.
- Future research focussed on the physical impact of the intervention should include analysis of data collected from wearable devices.

### **Caregiver, participant and service provider experience**

Objectives three and four were attained through interviews and analysis of survey data to explore the experience of programme participation and delivery from the perspectives of a diverse sample. The emergent themes reflected the motivations for joining the project, experience of taking part, success factors and challenges.

Caregivers shared the effects of living with dementia and/or Parkinson's Disease and the value of being able to engage in a meaningful activity which aligned with their partner's pre-morbid interests and lifestyle. The opportunity to fill time and connect socially were key incentives for joining the project articulated by several care-givers. The survey data indicated that the opportunity to be more physically active and experience connection held greatest appeal amongst respondents.

Caregivers expressed high levels of satisfaction with their experiences of Golf in Society combined with PT/OT. They described the sessions as a 'high point' within the week during which they enjoyed seeing their family member/partner looking happier and appreciated the opportunity to rest and connect with other caregivers. The survey data reflected very high levels of satisfaction with the programme, specifically around their experiences of the project team and access to support. The caregivers shared that they did experience feelings of depression, although survey data indicated moderate to high levels of life satisfaction and happiness.

The interview data highlighted the perceived benefit of PT/OT involvement within the Golf in Society programme. The PT/OT had provided some one-to-one support and advice which was highly valued. For example, the OT had optimised the golf club venue to ensure all participants could engage with the sessions and the PT had provided advice on home exercise programmes. The caregivers did not express recommendations to improve the programme, other than to improve its availability through scaling to a larger number of venues.

### **Service provider perspective**

The OT's emphasised the importance of a flexible approach towards individual assessment to observe and understand the needs of each participant. They aimed to optimise the environment and facilitate each participant to benefit as much as possible from the sessions. The clinicians reflected on the value of working in a non-traditional setting, but this also required the ability to adapt and ensure safety alongside innovation. The OT's had implemented problem solving skills to enable participation across a diverse range of attendees within a setting which was influenced by external factors such as the weather.

The interview data from service providers reflected the challenges associated with recruitment to the project. There were examples of participants with no prior experience of golf who, despite an initial belief that 'golf wasn't for them,' engaged with and reported benefit from the intervention. The appointment of a recruitment lead did facilitate uptake of participants; however, the limited duration of the project was a barrier to developing relationships with VCSE organisations with connectivity to ethnic minority groups and populations with high indices of multiple deprivation. A further challenge identified by the service providers was the administrative burden of running the project.

The service providers all shared a strong belief in the benefits of the golfing programme combined with PT/OT. The intervention was described as 'transformative' in reducing social isolation and enabling physical activity for people living with complex impairments. The project challenged the historic elitism associated with golf clubs and sought to address health inequalities.

### **Recommendations**

- Appointment of a project manager to develop sustainable administrative systems.
- Formalised recruitment pathway from NHS and VCSE organisations.
- Longer project duration to develop connectivity with external stakeholders and allow for refinement of the intervention and its evaluation.

### **CONCLUSION**

The evaluation of the 'Golf Clubs as Health Hubs' service model indicated that adapted golf coaching combined with PT/OT created a positive experience for participants and service providers. The measurement of physical impact of the intervention was compounded by the heterogenous sample and multiple extraneous variables, although improvement in physical performance was detected amongst some participants. The data collected from caregivers reflected very high levels of satisfaction with their experience of the project and the support accessed. The reported added value of PT/OT included one-to-one support, analysis of individual needs and advice for activities at home.

The 'Golf Clubs as Health Hubs' service model enabled people living with complex, age-related impairments and their care-givers to access support and increase their engagement in physical activity. Recommendations for future research include formal recruitment pathways from NHS and VCSE providers, implementation of a case series methodology and on-site facilities/equipment to measure physical performance.