FINAL REPORT ON PILOT PROGRAMME IMPLEMENTATION WITH RECOMMENDATION FOR ITS FURTHER MULTIPLICATION (DELIVERABLE D4.5)

Contribution to WP4 – Implementation and Evaluation of Pilot Programme

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With the support of:

- Foundation of the Europe Region of World Physiotherapy (ERWP)
- Outdoor Against Cancer (OAC)
- University of Bologna
- Italian Physiotherapy Assoociation (AIFI)
- Irish Society of Chartered Physiotherapists (ISCP)
- Kilkenny County Council (Kilkenny)

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INDEX

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1.Introduction to the pilot programmes

The UcanACT project - Urban ACTion for cancer prevention: adult and senior citizens practice physical activity within public urban green spaces to prevent cancer diseases - is an intersectoral initiative funded by the European Union, and joining together physiotherapists, local authorities, non-profit organisations, higher education, and research institutions from eight organisations from five EU countries. Coordinated by the Foundation of the Europe Region of World Physiotherapy (ERWP), the UcanACT partnership came together to engage adults and senior citizens to practice physical activity (PA) as a tool for cancer prevention within public urban green spaces (PUGS).

More specifically, the UcanACT project aimed at encouraging the participation of citizens over the age of 50 who have never suffered from cancer (primary prevention), those diagnosed with cancer (secondary prevention), or cancer survivors (tertiary prevention) in physical activity (PA) within PUGS.

To apply physical activity as a tool for cancer prevention, the project partners reviewed scientific research demonstrating the positive benefits of physical activity for cancer prevention among the adult target group, with a specific focus on outdoor physical activity sessions. The research activities formed the foundation for several key project deliverables, including the Citizens Engagement Strategy (CES), the Practical Intervention Methodology (PIM), the Massive Open Online Course (MOOC), and the UcanACT App. These tools were the pillars of the implementation phase of the project, which consisted of kick-off trainings and executing pilot cancer-preventive physical activity (CPPA) actions to test and validate the physical activity exercises outlined in the PIM, developed during the preparation phase. Three pilot territories hosted the pilot CPPA actions: Bologna, BLN, (Italy), Kilkenny, KLK, (Ireland) and Munich, MNC, (Germany) where 212 senior citizens took part.

The Practical Intervention Methodology (PIM) on delivering physical activity exercises for cancer prevention for adults and senior citizens within public urban green spaces was the first core project deliverable that provided conceptual and methodological bases for the implementation of pilot CPPA actions for adults and senior citizens within PUGS, in accordance with emerging scientific research evidence on cancer prevention. This methodology was also strongly supported by effective Health Enhancing Physical

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Activity (HEPA) methodologies, and the outputs and knowledge from the preparation phase.

The PIM was used and implemented during the pilot CPPA actions - defined as a combination of exercises (planned, structured, repetitive and intentional movements) aimed at prevention of cancer diseases - by physiotherapists and health professionals. They were provided with recommendations and guidelines, the procedures to be followed during the pilot actions and with the necessary characteristics of the UcanACT App, as well as indications on its structure and operation, so that the pilot CPPA actions could be carried out.

The methodology consisted of four interrelated chapters:

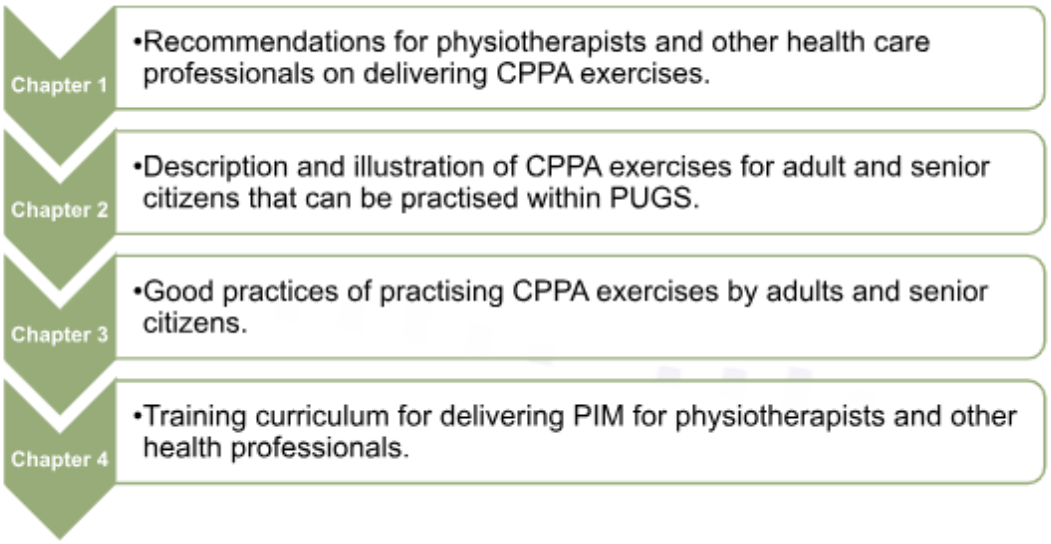

Figure 1. Chapters of the methodology

First, the project methodology was delivered to physiotherapists and health professionals via an online educational course, the aforementioned MOOC. They then participated in kick-off training sessions that were implemented within a two days programme. The sessions took place prior to the pilot CPPA actions in the three project pilot territories - Bologna (Italy), Kilkenny (Ireland), and Munich (Germany) - and were coordinated and provided, respectively, by physiotherapists from the Irish Society of Chartered Physiotherapists, the Italian Physiotherapy Association and Order of Physiotherapists of Bologna-Ferrara, and dedicated sports exercise staff at OAC. Physiotherapists and

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health professionals had access to the Methodology throughout the project implementation activities to be able to expand on this information if they wish, and were provided with a means of contact with the project partners in charge of the implementation of the pilot CPPA actions so that they could resolve their doubts about the methodology of the project at any time.

From 2024, pilot CPPA actions were implemented within two rounds in Bologna, Kilkenny and Munich between 10 - 12 weeks. The first pilot round (PR1) was aimed at testing and validating PIM with a special focus on adjusting it to the three project pilot territories and PUGS, and tested the UcanACT App in terms of its functionality and target group's needs. Within the second pilot round (PR2), the PIM and the App were validated for their further use by other municipalities interested in promotion of physical activity for cancer prevention.

Between PR1 and PR2, an evaluation period began and aimed at the evaluation of the application of the Practical Intervention Methodology and the UcanACT App. Using the results from this analysis, improvement strategies for the pilot round 2 were designed.

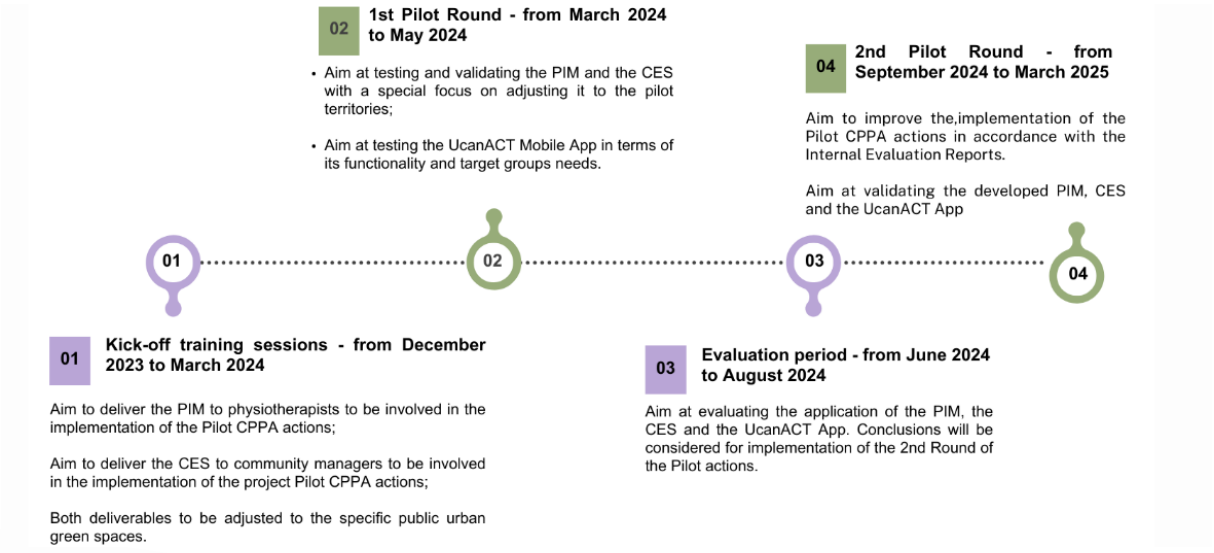

Figure 2. Pilots and evaluations processes.

Again, both rounds were implemented by physiotherapists and health professionals, with the support of communication managers from the three pilot territories. They were involved in the implementation of the Citizens Engagement Strategy, another core deliverable of the UcanACT projects aimed at improving opportunities to enable the

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project target groups (mainly adults and senior citizens) to actively take part in the cancer-preventive physical activity actions.

This report specifically aims to present the evaluation that was carried out to measure the impact of the pilot programme performed in the three territories. The evaluation consisted of two main parts in each round: the quantitative evaluation (composed of participants, UcanACT App, and intervention evaluation), and the qualitative evaluation receiving feedback from participants, professionals and community managers. The feedback collected was about their experience within the intervention as a whole, namely on the CPPA actions, the MOOC, the CES and the UcanACT App. Different dimensions were explored: general opinion, appropriateness, feasibility, expectations compliance, goals achieved and App usability and engagement.

The tools that were used for this process were scientifically validated questionnaires and interviews composed of open questions.

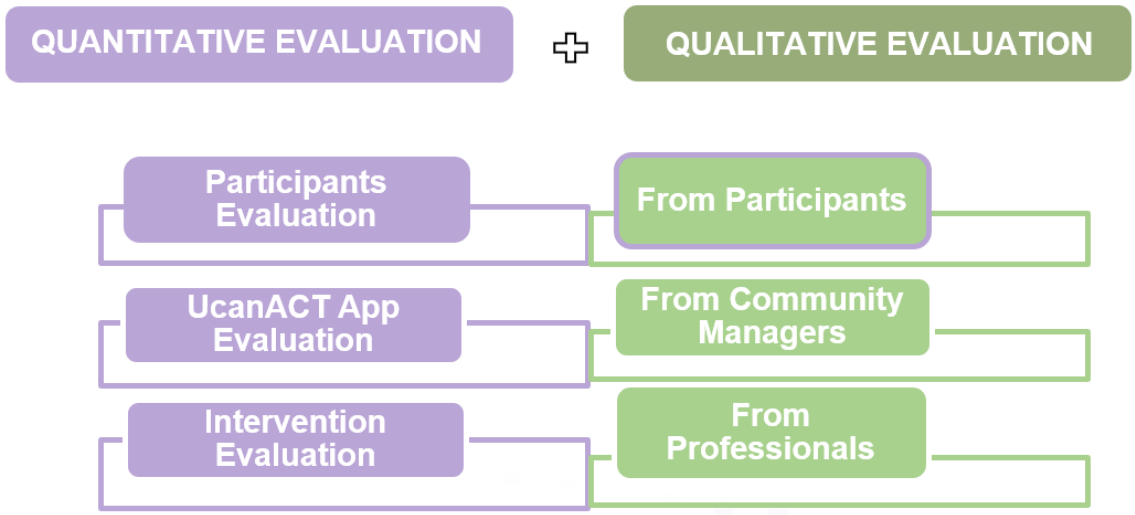

Figure 3. Evaluation structure

According to the results of this evaluation process, some recommendations are included at the end of the report.

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1.1 Variations to the methodology after the analysis of PR1

One of the aspects detected that needed improving was an excessive loss of outcome data due to deficiencies in the coordination and systematisation in their collection.

To improve data collection, coordination meetings were held with the three pilot territories after the completion of PR1 and before the start of PR2. The causes of data gaps were analysed and the territory with the best data collection shared their experience, and agreements were reached for the second pilot round. This action has generated a significant improvement in the quality of the data collected from PR2 with less data loss and fewer data inconsistencies.

Also, the surveys for participants and professionals have been restructured. For PR2, the surveys were the same for all territories; in PR1, they had small variations across territories. These surveys were reduced to avoid similar information and duplication, and to include greater detail on aspects that were considered of interest and that had not been previously collected.

The outcomes of concomitant pathologies, adverse events, and qualitative evaluation from professionals were simplified.

After the suggestion from the Kilkenny pilot territory, gathering of participants' goals was added to the pre-intervention data collection in PR2, and at the end of the intervention, an assessment was made of whether and to what extent these goals had been met.

Finally, the use of semi-structured interviews conducted through focus groups, which were rarely used in PR1, has been encouraged.

Additionally, changes have been made to the programme based on feedback from participants, professionals, and communication managers in the PR1.

Some of the PUGS were modified in the different territories to better adapt to the needs of the participants based on their suggestions.

Other communication tools were used to improve the flow of information between professionals, communication managers, and participants. This has helped improve engagement and reduce drop out ratios in PR2.

Finally, in PR1, a greater variety of exercises and grouping patients by activity levels were requested. In this second pilot round, the professionals tried to adapt to this need by increasing the adaptations of the exercises to each participant and making more variations on the exercises originally proposed.

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2. Quantitative analysis

Quality of Life (QoL), physical activity level (PAL), fatigue and risk of falls were examined as the main outcomes to measure the impact of the Pilot CPPA action on participants. They were chosen for their relevance as health indicators in cancer patients, according to the literature, and for their tendency to change with increased physical activity, as noted in previous research[1-13]. The validated tools selected to measure these variables are explained in Table 1.

Given that they are expected to change during the implementation of the pilot rounds, these variables will be measured before (Pre) and after (Post) both pilot CPPA actions.

Main Outcomes (Participants)		
PERIOD OF MEASUREMENT	**MEASURE**	**TOOL**
Pre and Post PR1 Pre and Post PR2	Quality of Life	EUROQOL combined (QLQ-C30 converted to EQ-5D-5L values + EQ-5D-5L) (all participants) QLQ-C30 (in participants diagnosed with cancer, 30 items) EQ-5D-5L (in participants not diagnosed with cancer, 6 items)
Pre and Post PR1 Pre and Post PR2	Physical Activity Level	IPAQ-SF (7 Items)
Pre and Post PR1 Pre and Post PR2	Fatigue	FRQ (12 items)
Pre and Post PR1 Pre and Post PR2	Risk of Falls	BFI (9 Items)

Table 1. Main Outcomes Variables (See Report D3.5)

Change in non-normally distributed variables were examined using the Wilcoxon test and are presented as median, first and third quartiles. Change in normally distributed

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variables were examined using two-sample t-tests and are presented as mean and standard deviation. This report shows the results and effect of the intervention after the programme, and the information about the implementation of pilot 1 actions in PUGS can be found in report D4.3.

2.1 Results on primary outcomes in PR2

2.1.1. Demographic description

A total of 146 patients (mean age 66.1 years) started PR2. Of these, 57 participants (39%) had been diagnosed with cancer previously, with breast cancer the most common one (59,6%) (table 2). The most common comorbidities were mobility limitation in the history of cancer group (21.2%) and osteoporosis in the no history of cancer group (25%). All the comorbidities are listed below, on page 10.

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	History of cancer		
	No	Yes	Total
N	89 (61.0%)	57 (39.0%)	146 (100%)
Age	65.9 (7.7)	66.5 (9.0)	66.1 (8.2)
Gender (n=144)			
Male	26 (29.2%)	7 (12.7%)	33 (22.9%)
Female	62 (69.7%)	48 (87.3%)	110 (76.4%)
Non-Binary	1 (1.1%)	0 (0.0%)	1 (0.7%)
Territory (n=146)			
KLK	23 (25.8%)	26 (45.6%)	49 (33.6%)
BLN	32 (36.0%)	20 (35.1%)	52 (35.6%)
MUN	34 (38.2%)	11 (19.3%)	45 (30.8%)
Year Diagnosis (n=49)			
Before 2000	N/A (.%)	3 (6.1%)	3 (6.1%)
Between 2000 and 2010	N/A (.%)	7 (14.3%)	7 (14.3%)
Between 2010 and 2020	N/A (.%)	18 (36.7%)	18 (36.7%)
After 2020	N/A (.%)	21 (42.9%)	21 (42.9%)
Cancer type (n=47)			
Breast	N/A (.%)	28 (59.6%)	28 (59.6%)
Prostate	N/A (.%)	3 (6.4%)	3 (6.4%)
Melanoma	N/A (.%)	4 (8.5%)	4 (8.5%)
Colon	N/A (.%)	7 (14.9%)	7 (14.9%)
Uterus	N/A (.%)	3 (6.4%)	3 (6.4%)
Lymphoma	N/A (.%)	1 (2.1%)	1 (2.1%)
Others	N/A (.%)	1 (2.1%)	1 (2.1%)
Cancer treatment (n=48)			
Yes	0 (.%)	18 (37.5%)	18 (37.5%)
Comorbidities	n=68	n=66	n=134
Peripheral neuropathy	8 (11.8%)	10 (15.2%)	18 (13.4%)
Lymphedema	0 (0.0%)	6 (9.1%)	6 (4.5%)
Ostomy	0 (0.0%)	1 (1.5%)	1 (0.7%)
Frailty	6 (8.8%)	10 (15.2%)	16 (11.9%)
Mobility limitation	12 (17.6%)	14 (21.2%)	26 (19.4%)
Diabetes	4 (5.9%)	2 (3.0%)	6 (4.4%)
Osteoporosis	17 (25%)	12 (18.2%)	29 (21.5%)
Urinary incontinence	7 (10.3%)	3 (4.5%)	10 (7.4%)
Bone metastasis	0 (0.0%)	0 (0.0%)	0 (0.0%)
None	14 (20,6%)	8 (12,1%)	22 (16,4%)

N/A: Not applicable
Note: Categorical variables are presented as frequency (percentage) and continuous variables (e.g., age) are presented as mean (standard deviation). Participants may present with more than one comorbidity.

Table 2. Demographic description of the participants at the beginning of the pilot 2.

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2.1.2 Goals of participants

Table 3 lists the objectives that participants wanted to achieve.

	History of cancer					
	No		Yes		Total	
	N	%	N	%	N	%
Total Sample Size	89	61,0%	57	39,0%	146	100%
Goal 1 - Increase fit level	68	76,4%	53	93,0%	121	82,9%
Goal 2 - Improve balance	45	50,6%	30	52,6%	75	51,4%
Goal 3 - Increase activity level	56	62,9%	43	75,4%	99	67,8%
Goal 4 - Socializing	44	49,4%	32	56,1%	76	52,1%
Goal 5 - Meet people with similar health issues	9	10,1%	14	24,6%	23	15,8%
Goal 6 - Spend more time outdoors	45	50,6%	40	70,2%	85	58,2%

Table 3. Description of participants' goals at the beginning of the treatment by diagnosis.

After Pilot 2, 133 (99.2%) participants considered themselves to have achieved their goals. Only one subject reported not having achieved them.

2.1.3 Effect of intervention PR2

Changes in variables related to Quality of Life.

The effect of the intervention was also measured by means of mean the EORTC QLQ-C30 and the EQ-5D-5L questionnaires. The EORTC QLQL-C30 was developed by The European Organization for Research and Treatment of Cancer and evaluates the quality of life in patients with cancer, and the EQ-5D-5L was introduced by the EuroQol Group as a standardised measure of health status in general.

The overall results for the Quality-of-Life variable across all participants have been calculated by converting the results of the total score obtained in the group of subjects with history of cancer (QLQ-30) to the equivalent of the Euro Qol-5D-5L using the regression proposed by Ameri et al[3].

Global quality of life (EUROQOLComb) increased significantly from pre to post intervention ($p<0.05$) (Table 4).

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	N	PRE median (SD)	POST median (SD)	p_value
EUROQOL comb	130	0.79 (0.22)	0.82 (0.18)	***0.01**

Note: The statistical test used was T-test.
*Statistically significant difference.

Table 4. Comparison of result of EUROQOL combined before and after PR2.

Results we show below for the QLQ-C30 were obtained from the sample of participants with history of cancer and for the participants without history of cancer we used EQ-5D-5L.

The values of each dimension at the beginning and the end of the intervention, as well as the p-value are shown in tables 5 for QLQ-C30 and 6 for EQ-5D-5L.

Table 5 shows the dimensions "role functioning," "emotional functioning," "cognitive functioning," "social functioning," and "fatigue" were statistically significant in history of cancer group. "Physical functioning" reached levels close to significance.

	variable	N	PRE	POST	p_value
Global Score	FinalScoreGlobal	57	70.9 (22.1)	71.9 (25.6)	0.61
Functional area	Physical functioning	57	87.1 (13.5)	90.8 (10.1)	0.06
	Role functioning	57	86.3 (23.0)	91.5 (15.8)	***0.01**
	Emotional functioning	57	73.5 (27.9)	81.0 (19.5)	***0.01**
	Cognitive functioning	57	77.2 (23.9)	84.3 (16.8)	***0.01**
	Social functioning	57	81.6 (25.7)	89.5 (17.9)	***0.05**
Symptoms	Fatigue	57	22.2 (11.1, 33.3)	11.1 (0.0, 33.3)	***0.01**
	Nausea and vomiting	57	5.8 (25.1)	2.0 (7.2)	0.77
	Pain	57	18.1 (20.5)	14.1 (20.6)	0.08
	Dyspnoea	57	12.9 (17.5)	9.2 (15.0)	0.37
	Insomnia	57	32.7 (29.9)	28.8 (26.7)	0.52
	Appetite loss	57	4.7 (16.0)	2.6 (9.1)	1.00
	Constipation	57	10.5 (20.1)	7.8 (17.1)	0.32
	Diarrhoea	57	7.0 (15.1)	5.2 (13.9)	0.42
	Financial difficulties	57	14.0 (29.5)	7.2 (20.3)	0.11

Note: The t-test was used for all variables except fatigue for which Wilcoxon signed-rank test was calculated. The values represent *mean (standard deviation)* for all the variables except Fatigue for which was used *median (first quartile, third quartile)*).
*Statistically significant difference.

Table 5. Pre and Post t QLQ-C30 scores and significance level for history of the cancer group.

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Table 6 shows statistical differences between the pre and post-test for the items 4 (related with pain/discomfort) and 6 (related with the overall current health) of the EQ-5D-5L for the participants without history of cancer group.

	N	Results_PRE	Results_POST	p_value
Mobility	88	1 (1, 1)	1 (1, 1)	0.525
Self-care	87	1 (1, 1)	1 (1, 1)	0.317
Usual activities	87	1 (1, 1)	1 (1, 1)	0.939
Pain/Discomfort	87	2.(1, 2)	1 (1, 2)	**0.013**
Anxiety/depression	87	1 (1, 2)	1 (1, 2)	0.209
Overall current health	87	80 (70, 90)	83 (75, 90)	**0.001**
Total Score	87	0.9 (0.9, 1.0)	1.0 (0.9, 1.0)	0.349

Note: The statistical test used was Wilcoxon signed-rank test.
The values represent the median represent median *(first quartile; third quartile)*.
*Statistically significant difference.

Table 6. Pre and Post EQ-5D-5L scores and significance level for no history of cancer group.

Changes in variables related with Physical Activity Level, Fatigue and Fall Risk.

The effect of the intervention was measured using the International Physical Activity Questionnaire – Short Form (IPAQ-SF), the Brief Fatigue Inventory (BFI) and the Self-Rated Fall Risk Questionnaire (FRQ) before and after the intervention.

Physical activity scores, measured by the IPAQ, and fatigue scores, measured by the BFI, changed significantly from pre to post intervention

	N	P value
IPAQ - SF	115	***0.0006**
BFI	129	***0.002**
FRQ	129	0.515

*Statistically significant difference

Table 7. Changes on IPAQ-SF, BFI and FRQ before and after the intervention PR2.

The effect of PR2 intervention in participants with a history **of cancer** is shown in table 8. **Fatigue** scores **reduced significantly in participants with a history of cancer** from pre to post intervention. No change was observed in physical activity levels or falls risk.

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	N	p_value
IPAQ - SF	39	0.329
BFI	57	***0.002**
FRQ	57	0.258

*Statistically significant difference

Table 8. Changes on IPAQ-SF, BFI and FRQ before and after the intervention for the group with history of cancer.

Participants with no history of cancer experienced statistical differences only in Physical Activity Level (PAL) between the beginning and the end of the PR2 intervention either (Table 9).

	N	p_value
IPAQ - SF	73	***0.01**
BFI	89	0.1
FRQ	89	0.9

*Statistically significant difference

Table 9. Changes on IPAQ-SF, BFI and FRQ before and after the intervention PR2 for the group without history of cancer

Results by territory

We analysed the variables before and after treatment within the different territories. In Kilkenny, PAL, Fatigue or Risk of Falls scores did not change significantly from pre- to post-intervention. However, in Munich, Physical Activity Level scores significantly increase and fatigue scores significantly reduced from pre- to post- intervention. In Bologna, PAL scores significantly increased, Fatigue and Risk of Falls scores did not change significantly from pre- to post- intervention (table 10).

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		IPAQ - SF	BFI	FRQ
Kilkenny N=40 (IPAQ-SF) N=49 (BFI and FRQ)	PRE	1932.00 (921.00, 4767.00)	0.4 (0.0, 2.0)	1.0 (0.0, 3.0)
	POST	2489.50 (1575.00, 3777.00)	0.4 (0.0, 2.0)	1.0 (0.0, 3.0)
	p_value	0.78	0.14	0.42
Bologna N=34 (IPAQ-SF) N=54 (BFI and FRQ)	Results_PRE	1041.50 (693.0, 2415.0)	1.4 (0.5, 2.8)	2.0 (1.0, 4.0)
	Results_POST	1971.0 (834.0, 3576.0)	1.1 (0.1, 2.6)	2.0 (1.0, 5.0)
	p_value	**0.003	0.14	0.81
Munich N=41 (IPAQ-SF) N=45 (BFI and FRQ)	Results_PRE	2274.0 (1596.0, 2853.0)	1.4 (0.6, 3.2)	1.0 (0.0, 2.0)
	Results_POST	2493.0 (1617.5, 3186.0)	1.3 (0.6, 2.7)	0.0 (0.0, 2.0)
	p_value	*0.05	*0.05	0.27

Note: Wilcoxon signed-rank test. The values represent *median (first quartile, third quartile)*.
*Statistically significant difference
**Clinically meaningful difference

Table 10. Analysis of IPAQ-SF, BFI and FRQ before and after the pilot 2 for each territory.

Statistical differences observed in Munich in IPAQ and BFI seem not to be clinically relevant according to Craig et al.[14] (IPAQ-SF) and Mendoza et al.[9] (BFI). IPAQ-SF in Bologna was clinically significant according to Craig et al.[14].

2.2 Programme participation-compliance

2.2.1. Description of attendance

We evaluated the programme's attendance. Table 11 shows the data organised into quartiles and according to different factors.

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	Attendance			
	0-25%	25-50%	50-75%	75-100%
Gender				
Male	26.6	25.0	18.8	29.7
Female	14.7	28.0	9.5	47.9
Non-Binary				100.0
Age_group				
<=60	29.2	40.3	8.3	22.2
60-75	10.5	25.1	11.7	52.6
>75	13.5	4.1	8.1	74.3
Participants				
PR1+PR2	13.7	26.6	14.5	45.2
Only PR2	20.5	26.9	9.0	43.6
Territory				
BLN			4.3	95.7
KLK	13.5	36.5	18.8	31.3
MUN	40.0	44.4	11.1	4.4
Diagnosed				
No	18.0	36.6	11.0	34.3
Yes	16.7	11.1	12.0	60.2

Table 11. Attendance of the intervention in percentage.

According to the data, women and participants over 75 years old showed better engagement with the programme than others.

2.2.2 App usability and engagement

To assess users' experience and engagement with the application we used the User Engagement Scale (UES-SF) and the System Usability Scale (SUS). For these analyses we consider as users: a) communication managers, b) participants and c) physiotherapists experiences.

User engagement (UE) is a quality of the user experience that is characterised by the depth of an actor's cognitive, temporal, affective and behavioural investment when interacting with a digital application or system. The UES-SF measure four dimensions related with the engagement: 1) Focused attention (feeling absorbed in the interaction and losing track of time), 2) Perceived usability (experienced as a result of the interaction and the degree of control and effort expended), 3) Aesthetic appearance (the attractiveness and visual appeal of the interface) and 4) Reward. Each dimension is confirmed by three statements each of which are scored with a Likert scale from 1 (strongly disagree) to 5 (strongly agree)[4].

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System Usability refers to the ability of any individual to carry out the action specified in the app without any type of complication, and the possibility of fulfilling the objective pursued. The SUS measures the perceived usability of a system, product, or service. Its purpose is to assess the overall user experience of a system, focusing on ease of use, efficiency and user satisfaction. It includes 10 items scored with a 5-point Likert scale from "strongly disagree" to "strongly agree".

Table 12 shows the mean scores for each dimension and the total score for the experience of each of the participating agents. As we can see in the table user engagement was for almost all dimensions and total score between 3 (neither agree nor disagree) and 4 (agree). Only the mean of “Focused attention” for the Communication Manager was less than 3 but the sample size for this population was too small (n=5) to consider this score reliable.

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User profile	Variable	N	Mean	p25	p50	p75
Communication manager	Focused Attention	5	2.8	**2.7**	**3**	**3**
	Perceived Usability	5	3.6	**2.7**	**3.7**	**4.7**
	Aesthetic Elements	5	3.9	**3.7**	**4**	**4**
	Reward Factor	5	4	**4**	**4**	**4**
	Total score	5	3.6	**3.2**	**3.7**	**3.8**
Patient	Focused Attention	109	3.1	**2.7**	**3**	**3.3**
	Perceived Usability	107	3.6	**3**	**3.7**	**4.3**
	Aesthetic Elements	108	3.5	**3**	**3.7**	**4**
	Reward Factor	108	3.9	**3.3**	**4**	**4.3**
	Total score	107	3.5	**3.1**	**3.5**	**3.9**
Physiotherapist	Focused Attention	29	3.1	**2.7**	**3**	**3.3**
	Perceived Usability	29	3.8	**3**	**4**	**4.7**
	Aesthetic Elements	29	3.4	**3**	**3.3**	**3.7**
	Reward Factor	29	3.9	**3.7**	**4**	**4.3**
	Total score	29	3.6	**3**	**3.6**	**3.9**
Total	Focused Attention	143	3.1	**2.7**	**3**	**3.3**
	Perceived Usability	141	3.7	**3**	**3.7**	**4.3**
	Aesthetic Elements	142	3.5	**3**	**3.7**	**4**
	Reward Factor	142	3.9	**3.3**	**4**	**4.3**
	Total score	141	3.5	**3.1**	**3.5**	**3.9**

Table 12. App engagement measured by UES-SF.

Table 13 shows the mean scores for each SUS item, as well as the overall score for each participating agent and the total sample. As can be seen in the table, the perceived usability of the App was good for all agents, with total scores close to 3 (neither agree nor disagree). The items that scored highest were 1 (“I think that I would like to use this App frequently”), 5 (“I found the various functions in this App were well integrated”) and 9 (“I felt very confident using the App”).

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User Role	Variable	N	Mean	p25	p50	p75
Communication manager	SUS1	5	3	3	3	3
	SUS2	5	2.2	1	3	3
	SUS3	5	4.2	4	4	5
	SUS4	5	2.4	1	3	3
	SUS5	5	3.6	4	4	4
	SUS6	5	1.8	1	2	2
	SUS7	5	3.6	3	4	4
	SUS8	5	2.4	2	2	3
	SUS9	5	3.8	4	4	4
	SUS10	5	2.6	1	3	4
	SUSRESULTS	5	2.96	2.7	2.8	3.2
Patient	SUS1	114	3.7	3	4	4
	SUS2	113	2.5	2	2	3
	SUS3	112	3.5	3	4	4
	SUS4	113	2.2	1	2	3
	SUS5	112	3.6	3	4	4
	SUS6	110	2.4	2	2	3
	SUS7	111	3.6	3	4	4
	SUS8	111	2.5	2	2	3
	SUS9	110	3.6	3	4	4
	SUS10	112	2.3	1	2	3
	SUSRESULTS	111	2.9	2.8	3	3.2
Physiotherapist	SUS1	29	3.1	3	3	4
	SUS2	29	3.1	2	3	4
	SUS3	29	2.9	2	3	4
	SUS4	29	1.8	1	1	2
	SUS5	29	3.6	3	4	4
	SUS6	29	2.1	1	2	3
	SUS7	29	3.2	3	3	4
	SUS8	29	2.3	2	2	3
	SUS9	29	3.7	3	4	4
	SUS10	29	2.1	1	2	3
	SUSRESULTS	29	2.8	2.5	2.8	2.9
Total	SUS1	148	3.6	3	4	4
	SUS2	147	2.6	2	3	3
	SUS3	146	3.4	3	4	4
	SUS4	147	2.1	1	2	3
	SUS5	146	3.6	3	4	4

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	SUS6	144	2.3	1	2	3
	SUS7	145	3.5	3	4	4
	SUS8	145	2.5	2	2	3
	SUS9	144	3.6	3	4	4
	SUS10	146	2.3	1	2	3
	SUSRESULTS	145	2.9	2.7	2.9	3.2

Table 13. App usability measured by SUS scale.

3. Qualitative analysis

3.1 Conclusions and recommendations from PR1 (report D4.3)

After PR1 of the cancer-preventive physical activity programme within public urban green spaces, for adults and senior citizens over the age of 50 who have never suffered from cancer, those diagnosed with cancer, or cancer survivors, we can conclude the following.

In relation to the effect of the programme, results seem discrete, with the biggest impact obtained in physical activity levels, and a lighter effect on reducing risk of falls. The CPPA actions did not appear to have any effect on participants' level of fatigue, nor in quality of life, although clinically significant positive changes were obtained in insomnia. By territories, Kilkenny was the one who obtained a bigger impact on their population, followed by Bologna. In any case, this data was probably affected by the data loss in two of the three pilot territories, not being able to obtain adequate quantitative data from the main outcome measures from a considerable number of participants.

Therefore, it will be necessary to improve the coordination of data collection in PR2, carrying it out in a more systematic way to avoid unnecessary data loss.

Regarding the perception of all the participants, the participants, healthcare professionals and communication managers overall are satisfied with the programme.

Participants felt cared for by the physiotherapist and were being inspired by others of the group. They recommend the programme and mention that they obtained diverse benefits such as cardiorespiratory, balance, strength, more social interaction or less anxiety. However, they request more locations, sessions and flexibility for appointments, toilet facilities, and to have indoor spaces for bad weather near some of the PUGS. Some of them request a greater variety of exercises because they consider that they do not change much from one week to another or from the beginning to the end of the intervention.

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Professionals pointed out that the physical activity groups should be arranged according to physical activity levels. Then the group exercises can be adjusted to the individual needs of the participants. Also, some of them commented that the dropouts are largely due to holidays and medical and family commitments and that they had to collect too much data and that they did not have help available for the administrative activities.

There were more *dropouts* than desirable, so we must try to put in action the engagement procedures suggested by professionals, communication managers, and participants as a priority.

Moreover, in the qualitative analysis, different questions and different ways of collecting data were used in the pilot territories, compromising our capacity to do a proper global analysis. To have more coordination meetings between pilot territories and the partners responsible for evaluation, seems necessary. In addition, an effort to homogenise surveys must be done by the partner responsible for evaluation.

Regarding *communication*, both patients and professionals agree on the need to send more reminders and suggest doing so through WhatsApp. Communication managers suggest carrying out more dissemination and contacting more patient associations and general practitioners to inform about the programme.

The App seems to be beneficial but must be implemented in all territories and in the iOS version for PR2.

Following the information obtained in this first pilot round, changes were made for the second pilot data collection - to simplify it - specifically for the outcomes of the concomitant pathologies, adverse events, and the qualitative evaluation from professionals.

3.2. Results from PR2

3.2.1. Data collection

For the qualitative evaluation of the project in the first pilot round, semi-structured interviews were conducted in focus groups to the participants of Kilkenny. The questions to the professionals and to the communication managers of the three territories, and to the participants of Munich and Bologna were carried out through questionnaires.

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In the second pilot round, semi-structured interviews were conducted in focus groups to the participants in each of the 3 territories. Focus groups were also held with professionals in Kilkenny and Munich and individual interviews were conducted in Bologna. The questions to the communication managers were carried out through questionnaires in Kilkenny and Munich and individual interviews were conducted in Bologna.

The semi-structured interview is a method that allows for obtaining rich and detailed information about the experiences and perspectives of the participants.

Its main advantages include the flexibility to adapt questions based on the responses received, the ability to explore emerging themes, and the possibility to delve deeper into specific areas of interest. Thus, while a common list of questions was prepared for all territories, some questions emerged only in one or two of them.

This participant-centred approach facilitates the construction of collaborative knowledge, capturing the complexity of the phenomena studied. Our aim in selecting this methodology was to gather information about the experience of each of the integral parts of the project in order to study the impact of the UcanACT programme, its appropriateness and feasibility. Likewise, it was important to find out which aspects of the programme have not yielded positive results and need improvement, in order to generate knowledge that will help in the creation of future, more successful programmes for cancer prevention and health promotion in the European population.

We will present the data jointly first, presenting the categories that emerged in all 3 territories, and analysing the differences subsequently.

3.2.2. Evaluation from participants

Participation data

A total of 43 participants in the UcanACT programme were interviewed in 6 focus groups across the 3 pilot territories: 1 group of 5 participants in Munich, 3 groups with a total of 15 participants in Bologna, and 2 groups with a total of 23 participants in Kilkenny. The feedback obtained from participants in the 3 pilot territories is very similar, coinciding in the main positive and negative aspects of the programme, which we detail below.

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The feedback indicates that the programme was successful in providing a **positive, motivating, and beneficial experience for participants**, combining physical activity with social interaction in a supportive environment.

Programme satisfaction levels

High satisfaction levels with the programme were reported by the majority of participants. Some expressed regret that the programme was ending and their willingness in participating again if the programme was to be repeated.

Positive aspects of the programme

The most positive aspects in general were the following (listed in order of the number of participants mentioning them, from the most to the least):

1- **Staff** (Physiotherapists and Trainers). Highly praised for their expertise, individual attention, and motivational skills. Appreciated for their young, dynamic, and cheerful nature. It was well liked by the participation of students (in Kilkenny).
2- **Outdoor location** was highly appreciated for the fresh air and psychological benefits.
3- The social **aspect** of the programme was highlighted, especially the nice atmosphere and sense of camaraderie among participants.
4- **Regarding the programme** itself, regular schedule (twice weekly) and good organisation were highlighted. Also, the gradual progression of exercises was noted positively. Also, no-pressure environment and inclusivity were appreciated.
5- **The exercises in the programme**. Coordination and balance exercises were particularly appreciated, and exercises in general were considered easy and beneficial for all. It is interesting to mention that participants felt safe during exercises.
6- **Other positive factors** mentioned were:
    a. **Motivation** to stay active.
    b. **Improvements in physical and mental health**.

Physical activity sessions

When participants were asked about the PA sessions of the programme, about the characteristics that were liked of it, they mentioned the following points:

1- Exercises were tailored, well-defined, and repeatable. Reaction exercises, and coordination exercises were challenging but appreciated. Balance exercises for

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fall prevention in the elderly were felt as the core of the programme. Participants experienced muscle pain but saw **benefits** like increased muscle mass.

2- The programme was perceived as **challenging** in a positive way and enjoyable. Encouraged physical activity at unexpected times, leading to satisfaction.

3- About the **physiotherapists** that conducted the sessions, the participants highlighted the fact that they adapted exercises to ensure everyone could participate. They were described as supportive pillars helping participants improve.

4- As additional aspects, the **outdoor** setting and **socialisation** (group exercises were mentioned specifically) were brought up again.

Programme benefits

A key aspect of the programme was to improve the health of participants. When asked about the benefits obtained from the programme, their replies indicated that they benefited in the following aspects:

1. **Physical Health Benefits**:
    a. Improved confidence and stability in movement.
    b. Better balance and flexibility.
    c. Reduced pain and stiffness.
    d. Weight loss and improved diabetes management.
    e. Increased energy and better sleep.
    f. Discovery of forgotten muscles and joints.
    g. Resolution of specific health issues (e.g., Achilles tendinitis).
2. **Social Benefits**:
    a. Opportunity for social interaction and community building.
    b. Motivation from group exercises.
    c. Enjoyment of collaborative activities.
    d. Cultural exchange through meeting people from different backgrounds.
3. **Exercise-Related Benefits**:
    a. Comprehensive approach to exercising different muscle groups.
    b. Appreciation for both indoor and outdoor exercises.
    c. Value of weight training and balance exercises.
4. **Educational Benefits**:
    a. Learning about body mechanics and proper exercise techniques.

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b. Increased body awareness.

5. **Mental Health Benefits**:
    a. Improved patience and self-awareness.
    b. Better self-care and prioritisation of personal health.
    c. Enhanced mental well-being and feeling of rejuvenation.

Recommend the programme

When asked if they would recommend the programme to a friend, participants unanimously said yes. In fact, many had already recommended it to others and some successfully convinced friends to join. The positive aspects they highlighted for promoting the programme were the following:

- ✓ Free of charge.
- ✓ Expert guidance from physiotherapists and trainers.
- ✓ Physical activity in a social setting.
- ✓ Oncological focus.
- ✓ Opportunity to meet people with similar issues.
- ✓ Promotes independent living and active participation in society.
- ✓ Potential to reduce healthcare costs and reliance on nursing homes.

However, ***challenges*** in convincing others were also mentioned. One participant expressed frustration at being unable to convince friends, and others noted reluctance in people due to **laziness or fear** of physical exertion.

On the other hand, ***broader implementation was suggested***. Participants expressed their **hope for the programme to continue**, including outdoor sessions and their willingness to participate again. Also, they suggested the creation of similar programmes in workplaces and nursing homes and the programme potential as **a way of saving money** since it could reduce the need for traditional physiotherapy sessions.

Importance of being regularly active

The majority of participants reported an increased awareness of the importance of being regularly active. The main aspects mentioned include:

1. Enhanced motivation to maintain activity.
2. Realisation of the need for more frequent exercise.

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3. Increased enjoyment of training.
4. Recognition of the importance of effort and persistence.
5. Improved understanding of personal physical capabilities.
6. Discovery of previously unused muscles.
7. Increased awareness of the mind-body connection.
8. Recognition of exercise's importance for both body and mind functions.
9. Increased focus on coordination and balance, not just endurance and strength.

On the other hand, one participant reported no increase in awareness, and another participant noted a decrease in self-esteem upon realising their actual fitness level was not as good as he thought it was.

New knowledge about the benefits of exercise

The majority of the participants that answered this topic said yes. From their answers we can infer the importance of education as a means of **motivation** and as something fundamental in the **elimination of barriers** to physical exercise. The points highlighted by the participants were the following mainly:

- Small, seemingly light-minded exercises can be highly effective.
- Exercises can be done differently than traditionally thought.
- Direct experience of exercise benefits is more impactful than theoretical knowledge.
- Importance of strength training 4 days a week.
- Exercise helps avoid frailty and maintain independence.
- Better understanding of specific movements encourages more physical activity.
- Physical activity has numerous positive effects.
- Importance of varied exercises beyond just cycling.
- Stepping out of comfort zones can be beneficial.
- Learning to trust one's body again through training.
- Having a sports partner with different performance levels can be motivating.

However, some participants were already well-informed about exercise benefits and reported not having learned anything new.

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Locations, accessibility and feasibility

Overall, while the **locations were generally well-received**, there were some specific issues related to accessibility, terrain, and weather that could be addressed to improve the experience.

Regarding accessibility and feasibility of locations, there was general agreement that locations were accessible and feasible. They were easy to reach by public transport with good parking availability. Also, participants appreciated the green spaces.

Nevertheless, **areas for improvement** in Public Urban Green Spaces were:

- Long trips to some locations (Ca'Bura, Isarauen) demotivated some participants.
- Irregularities in the ground caused difficulties for some participants.
- Tree roots covered by artificial grass posed a hazard.
- Difficulties parking at Castle Park.
- Lack of toilets mentioned in Kilkenny (though portable toilets were available).
- Some participants disliked outdoor activities in bad weather, mainly because they were concerned about the cold affecting their health.
- One participant would have preferred locations near water.

Engagement with physiotherapists and trainers

Regarding the engagement with physiotherapists and trainers, in *Munich* and *Bologna* the feedback was overwhelmingly positive. Physiotherapists were highly engaged and available, attentive to individual needs and difficulties, professional, competent, supportive and encouraging. **Physiotherapists provided good health advice, personalised attention and medical expertise**.

Participants felt **well-supported** and in good hands, comfortable performing exercises and that they were individually attended to.

The programme atmosphere was relaxed and non-competitive and focused on individual capabilities.

One participant mentioned disliking the trainers, although he liked physiotherapists.

In *Kilkenny*, the engagement of the County Council was discussed. There was general agreement on excellent support and constant contact. Participants felt supported and

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thanked the fact that they were encouraged to go to the sessions and congratulated when going.

Overall, the feedback indicates a **highly positive experience with both physiotherapists and city council support,** with only minor isolated concerns.

Changes in their health-related behaviours

According to interview data, **slightly less than half of participants made changes in their health-related behaviours** as a result of the programme. This is a very important aspect to consider, since **behavioural change is one of the most difficult things to achieve** in health programme patients. It seems that the programme served as a catalyst for adopting healthier lifestyles and increasing physical activity and fostered a sense of community and accountability, which helped maintain motivation. While it would be interesting to know if these changes are maintained over time, this is beyond the scope of this project.

The changes mentioned were:

1. **Increased Physical Activity:**
   - More walking (5 participants).
   - Joining a gym and taking Pilates classes.
   - Daily walks around the house or park.
   - Improved fitness and step tracking.
2. **Health Improvements**:
   - Better discipline in other health habits (e.g., reduced alcohol consumption, improved diet).
   - Increased awareness of joint movements and everyday gestures.
3. **Enhanced Motivation**:
   - Renewed desire to stay fit, regardless of weather conditions.
   - Awareness of personal capabilities and limitations.
   - Importance of social connections and structured commitments for maintaining motivation.

Social interactions of the participants

The programme also appears to have **a positive impact on the social interactions** of the participants. 10 respondents reported improvements in this area, with the formation of new acquaintances and lasting friendships. Increased friendly interactions within the

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community were also mentioned, as well as connection with peers of similar age, especially among women participants.

The programme also provided additional socialising opportunities for already social individuals. However, low male participation suggested a need for more targeted activities for men.

UcanACT App evaluation

Extensive discussion of the App was established in the focus groups. Altogether, while the UcanAct App was generally **well-received** and found **useful** by many participants, there are several **areas where improvements could enhance** user experience and functionality. The main **problematic topic was the late arrival** of the App, particularly in Kilkenny and Munich, which has probably had a negative impact on the users' experience.

In relation to the **positive aspects** of the App, participants found it **appealing and motivating,** with good exercises examples. Some (especially in Bologna) considered the App to be helpful for continuing exercises out of guided CPPA sessions and remembering them. Specifically, 12 users (28% from the total that participated in FG) reported feeling motivated to exercise alone using the App.

In addition, the App was described as **well-made and easy to interpret**. Moreover, it was generally found to be **very intuitive and easy to use** once installed.

Lastly, a few participants mentioned that the App had taught them how to enjoy the benefits of outdoor physical activity.

On the other hand, several **aspects that should be improved** in the App were mentioned, mainly related to **technical issues** with the App. These comments were more abundant in Kilkenny and Munich than in Bologna. We consider, as mentioned earlier, that this may be due to the late arrival of the App in these two pilot territories, especially the iOS version. In favour of this reasoning is the fact that 6 participants in Kilkenny (who represent 35% of the participants who took part in the focus groups in this pilot territory) explicitly stated that the reason the app did not motivate them to exercise on their own was its late arrival.

We present below a list of the elements pointed out by the participants, grouped by categories for better understanding:

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1. **Technical Issues**:
    - Password reset functionality missing.
    - Problems with cloud synchronisation.
    - Difficulties with initial download and installation.
2. **User Interface**:
    - Not intuitive enough for some users.
    - Small screen size on mobile devices makes viewing exercises challenging.
3. **Content and Features**:
    - More close-up shots of specific body areas during exercises requested.
    - Repetitive questions at the end of sessions.
    - More repetitions of exercises desired.
4. **Timing and Notifications:**
    - Late arrival of the App in some locations (e.g., Kilkenny).
    - Suggestion for reminders to do exercises.
5. **Sound Quality:**
    - Background noise in videos is distracting.
    - Wind noise while using the App.
6. **Miscellaneous:**
    - Some users found it not very useful because they had trouble using it during CPPA sessions, in the sense that holding the phone was sometimes tricky during the exercises.
    - The initial questionnaire was problematic for some users.

Barriers

In ***Kilkenny***, an additional question emerged during the focus group (FG): whether participants believed that cost would be a barrier to attending future programmes like UcanACT. Most participants indicated that cost would not be a significant issue because they have come to appreciate the value of having a physiotherapist guide the sessions. The **presence of physiotherapists was seen as a major benefit.** They also highlighted that they now understand what the programme offers, which makes them more willing to pay for it. However, they recognise **cost might still be a barrier for some individuals.**

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Additional comments

Finally, Participants were asked to give any additional comments about the programme, to express themselves freely to say anything they thought to be important but wasn't asked to them before. Although only a few participants (4 out of the 43 total, 9%) added some comments, we think they are quite relevant, hence we present them now.

Participants emphasised the importance of **group dynamics and interactions** with other groups as key factors for maintaining exercise routines. They envisioned an ideal outcome where people would casually gather in parks for group exercises, similar to practices observed in China. However, they also highlighted areas for improvement. One participant regretted that the **App used in the programme would no longer be functional,** suggesting that using an existing App might have been a better option. Additionally, to better track improvements, participants proposed the use of a **body chart to monitor pain and tightness.**

Goals

A total of 134 responses were obtained regarding the goals the participants pursued with the implementation of the programme from 151 total participants. 46 responses in Kilkenny of 51 participants, 48 in Munich of 48 participants and 40 in Bologna of 52 participants.

77 responses from new participants in the second pilot. In Kilkenny, 25 new responses were received, 12 of them diagnosed with cancer out of a possible 30. In Munich, 33 responses, 7 of them diagnosed out of a possible 33. In Bologna, 19 responses were received, 7 of them diagnosed out of a possible 27.

57 responses from participants who had previously participated in the first pilot round. In Kilkenny, 21 responses were received, 13 of them diagnosed with cancer, out of a possible 21. In Munich, 15 responses, 5 of them diagnosed with cancer, out of a possible 15. In Bologna, 21 responses were received, 8 of them diagnosed with cancer, out of a possible 25.

The goals set by participants prior to the intervention were diverse. While the most common goal by far across all territories was to improve physical health followed by increasing their socialisation, there were slight variations between territories. In Kilkenny, the main focus was on improving physical fitness; in Munich, increasing activity levels; and in Bologna, promoting socialisation. Only one person reported having no

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expectations. The goals are detailed in table 15 in order of frequency which were mentioned by the participants.

Grouped Goals	Detailed Goals
Physical health	Improve fitness level/Improving physical condition or physical shape/Get fitter/Become fitter/Improvement of physical health/Stay in shape
	Increase the level of activity
	Improve mobility / Flexibility / Reduce stiffness
	Improve balance
	Move more / Reduce sedentarism
	Improve strength
	Lose weight / Weight control
	Improve posture
	Improve stamina/More energy
	Become more endurance
	Becoming more agile/To maintain or increase my level of agility going forward
	To get a better sense of my level of fitness
	Improve an injury
	Stronger bones
	Gain physical power
	Improve coordination
	Improve the back
Socialization	Make new friends
	Socialize
Mental health	Have fun/Enjoy it/Be happier/Becoming more cheerful
	Mental health
	Relax
	Feel calmer
Outdoors	To get out of the house/Spend time outdoors
Motivation	Improve my motivation to do exercise
	Do something good for myself
	Being motivated by the group
	If I have a specific appointment than if I have to motivate myself
	Trying to increase my desire for physical exercise
	Reduce my laziness

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Exercises	Variety in sporting activity
	To try new exercise
	Do exercise correctly
	To be able to do light exercise
	Regularly supervised exercise training
	More targeted movement
	Acquire fluidity in movements
	Walking
	To be more relaxed in movements
	Do physical activity
	Stand up more
Recover activity	Get my fitness level back
	Being able to stand up again/Be able to get up again
	To get back doing regular cardio exercises
	Need to get back to swimming
	Start moving again
	To counteract the damage of a forced, almost absolute, sedentary lifestyle
	Being able to grab things again
General health	Improve well being
	Maintain independence in later years
	Reduce the pain when I get up
	Improve health
	Mitigating locomotor difficulties and related limitations in practical and/or relational activities
	To improve
	To keep well
	Stay physically and mentally fit by participating in various activities
Adherence	Learn to do regular exercise
	Structure in the day
	Keep me physically active
	Restore a healthy rhythm that includes time dedicated to physical form by toning the body
	To make self-care part of daily/weekly routine by participating in activities
Learning	To learn
	Learn different ways of exercising
	Awareness on the after effects of cancer and how to incorporate any positive changes into my life

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	Learn to understand your own movement limits without exceeding them
	Learn to perform a simple physical activity to improve body and mind
	Good training where you can learn something
Self-confidence	To grow my confidence in physical ability
	Gain confidence in walking, moving, and driving
	Overcome the fear of falling when going down stairs
	Recover awareness in your own self
Prevention	Prevention
	Prevent general aging
	Interested in what the programme is achieving for older people

Table 15. Pre-intervention participants' goals.

Post-intervention evaluation of participants´ goals has been carried out in the quantitative analysis, assessing whether they have been met and the degree to which they have been met.

3.2.3. Evaluation from professionals

Participation data

A total of **16 physiotherapists** and other health professionals (PTs) that conducted the CPPA sessions of the UcanACT project participated in 2 focus groups (1 in Kilkenny with 5 PTs and 1 in Munich with 3 PTs) and in 8 individual online interviews in Bologna.

The feedback obtained from PTs in the 3 pilot territories is very similar, as was the case with the participants, coinciding in the main aspects of the programme they liked and which ones they think should be improved. Below we present a comprehensive summary of this feedback.

PIM and MOOC opinion

Firstly, PTs were asked to express their opinion on PIM and MOOC. PTs generally found **MOOC and PIM useful**, with the exam being well-tailored and serving as a good review checkpoint. In addition, the comprehensive nature of MOOC and the detailed information provided were specially appreciated. Both resources were found to be well suited to a variety of environments and skill levels from participants.

They highlighted specially as **positive aspects the training sessions**, which proved to be **really helpful**, the fact that the MOOC was easy to follow and that the information provided was detailed and precise.

However, they also mentioned some aspects they found **needed improving**:

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- ✓ Both MOOC and PIM are lengthy and redundant. It would be useful to **eliminate the duplication of information** between the two documents.
- ✓ PIM could be **more visually** organised to improve readability.
- ✓ There is overlap with in-person training.
- ✓ More **specific guidance on clinical scenarios** would be beneficial.

Implementation of the programme

As for the implementation of the exercise programme, overall, there is **general satisfaction** with it and the implementation was well-received, particularly due to its outdoor setting, which added variety and interest for participants. **Communication via WhatsApp** between the physiotherapist and participants was also a strong point, facilitating engagement and feedback. Initially, the physiotherapists followed the programme's rules strictly, but as they gained confidence, they incorporated a more balanced approach, combining strength, cardiovascular exercises, and balance activities, which made the sessions more engaging.

The programme's structure, including **twice-weekly classes**, **was effective** in maintaining participant engagement and allowing them to see improvements. The **class duration of one hour** was well-suited for the content, and the timing worked well for most participants. The **inclusion of social elements**, such as games, helped build camaraderie among participants and with the physiotherapists. The **locations were ideal** for safety and teaching purposes. Participation rates were high, with few dropouts, indicating the programme's success in retaining interest.

However, there were a few **areas identified for improvement**. Occasionally, participants forgot to cancel their attendance or misunderstood the start time, which was largely beyond the organisers' control. Another suggestion was to **increase the variety of balance exercises** to enhance programme diversity. Despite these minor issues, many PTs expressed satisfaction with the programme as it was, with some even stating they wouldn't change anything.

Challenges during the implementation of the programme

During the discussion in ***Kilkenny***, physiotherapists gave their opinion on the challenges they faced during the implementation of the exercise programme. Initially, it was **difficult to ensure that all participants were adequately challenged**, particularly during the first few weeks. The programme struggled to bring everyone up to a similar level of

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efficiency and challenge, which was necessary for improvement. In hindsight, it might have been beneficial to introduce light weights early on to better engage participants.

Another challenge involved participants with very **low baseline fitness levels**, who required nearly full supervision. This necessitated having more hands-on support, such as additional physiotherapists or students, to manage these classes effectively. Although there were initial concerns about insufficient supervision, the programme ultimately received ample support, which helped it run efficiently. Despite these challenges, the programme proved adaptable and functioned effectively in the long run.

Benefits of participants

In terms of the benefits the participants obtained, PTs think that the outdoor exercise programme had a **profoundly positive impact on participants**. Being outdoors enhanced the group dynamic, as people enjoyed fresh air and a change of environment. This setting encouraged more playful and creative movement, boosting confidence in their bodies.

Also, PTs highlighted that **regular attendees showed significant improvements in balance and agility.** The programme also fostered strong **social connections**, with participants forming their own community and friendships outside of class. Additionally, it provided opportunities for activities not typically done in daily life, such as partner drills, and promoted a connection with nature.

Moreover, in PTs opinion, the **benefits included enhancing strength, balance, and body awareness while reconnecting participants with their bodies**. **Cognitive benefits** were also noted, contributing to an overall improvement in quality of life. The **social aspect was particularly strong**, with participants meeting outside of class and maintaining high attendance throughout the programme. This led to a confidence boost in their exercise abilities and enjoyment of the activities.

However, a few PTs (2 out of 16) mentioned that the outcome measures used may not have fully captured the physical benefits observed. They suggest that utilising **more physio-specific outcome measures could provide a clearer picture of the significant improvements** achieved by participants.

UcanACT App

As for the UcanACT App, PTs found it was generally **easy to use and intuitive**, making it a valuable tool for guiding users through exercises, particularly at the beginning of the

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programme. Participants appreciated its simplicity and functionality, which served as a memory aid for quick access to exercises. PTs think that the App **motivated users to take responsibility for their own fitness**, offering an alternative option when classes were cancelled, and that it allowed users to progress through exercises on a week-to-week basis, which was a beneficial feature.

However, there were also **several areas for improvement**. One major issue was the **password system**, which required users to reset passwords through email, a process that could be simplified. Some users experienced difficulties accessing the App and gave up, which might have been a common experience among participants. The App was **introduced too late in the pilot programme**, which hindered its effectiveness. Furthermore, not all participants used the App, and some found it boring or less engaging compared to other available fitness Apps. The questionnaire for assessing exercise ability was overly frequent and frustrating for some users. Lastly, the App lacked interactivity and vocal instructions, which would have enhanced the user experience.

In terms of usability, the App was **generally self-explanatory with nice videos in PTs opinion**, but it could benefit from clearer progressions and more interactive features. The reminders were appreciated, but the App's overall engagement was limited due to its lack of regular use and interactivity. It was not seen as a replacement for the benefits of attending regular exercise classes, and its introduction later in the pilot programme affected its adoption among participants. In fact, the App's impact on participants during sessions was perceived as mixed. Some individuals benefited from using it, particularly during sessions, while others found more value in simply attending the programme's classes. This suggests that the App can be helpful for certain participants, but its benefits are not universally experienced.

In addition, the **App does not seem to be a key factor in participants' engagement with the programme, as PTs see** it. When asked about the benefits of the programme, nobody highlighted the App as a significant advantage. Instead, PTs mentioned other aspects such as social interaction and physical improvement. Specifically, in Bologna, the App was not seen as fostering engagement or having a significant impact on most participants. This indicates that the App may not be a crucial component of the programme's overall effectiveness.

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Additional information

When asked if they wanted to add something, PTs commented on what they felt to be the key aspects of the project. It has been noted by physiotherapists involved in the project that **exercising outdoors is a highly beneficial aspect** that is often underutilised, particularly in countries with unpredictable climates. The benefits of outdoor exercise, such as improved mood and sleep quality, were observed to be significant. Despite the challenges posed by weather conditions, outdoor sessions were found to be more invigorating than indoor ones, with participants often feeling more energised.

The project was also praised for **its intersectoral collaboration**, bringing together stakeholders like; Kilkenny County Council, Irish Society of Charted Physiotherapists, Academic Institutions (University of Limerick & Trinity College Dublin); Physiotherapists from the Irish HSE (Public Sector) and private practice. This approach highlighted the importance of addressing **health improvements beyond the healthcare system alone**. The initiative was seen as a **successful model for promoting health in a community setting**.

The **social aspect of the project was another key highlight**. Participants enjoyed the sense of community and connection that developed during the sessions. Moments of joy and gratitude were frequently observed, such as when participants continued to engage in physical activities beyond the scheduled sessions. These interactions were noted to foster deeper relationships between participants and physiotherapists, allowing for more holistic support.

On the other hand, physiotherapists mention a **few aspects of the programme they consider can improve**, including enhancing the dissemination of project content through media and improving the accessibility of the UcanACT App. Additionally, it was recommended to organise sessions during brighter and warmer hours to address issues related to light availability. Clarity in planning, including the number of sessions and roles of physiotherapists, was also emphasis ed for future improvements. Overall, the project was well-received and considered beneficial, with a strong interest in its continuation.

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3.2.4. Results from communication managers

Participation data

The Communication Managers (CMs) involved in the UcanACT project (2 in Kilkenny, 3 in Bologna and 1 in Munich) provided **insightful feedback on the Citizens Engagement Strategy (CES)** through 5 surveys with 16 questions. In this section we present a comprehensive summary of those.

CES general opinion

Generally, CMs found the CES to **be highly effective**, particularly in ***Kilkenny***, where Kilkenny County Council successfully mapped stakeholders, recruited participants, and implemented the pilot rounds of the outdoor exercise programmes in three PUGS. This demonstrates the value in how well local authorities can effectively collaborate with stakeholders and engage citizens in public health initiatives.

The strategy allowed for valuable reflection periods between rounds, enabling improvements and offering a comprehensive overview of barriers and facilitators in engaging adult citizens in Community-Led Participatory Physical Activity. The CES was deemed extensive and well-utilised during recruitment, with no fundamental gaps identified in the concrete CES implementation.

However, there were **suggestions for improvement**. One key recommendation was to initiate the CES earlier in the project timeline, ideally at the end of Work Package 2 before conducting focus groups. This would have prevented the retrospective feel that sometimes accompanied the strategy's implementation. Another area for change involved the follow-up process with non-attending participants. While documenting reasons for non-attendance was crucial for research purposes, it was time-consuming and occasionally felt intrusive. For long-term sustainability, the managers suggested that follow-ups could be reserved for participants missing multiple consecutive sessions, such as four.

Additionally, the managers noted that certain **challenges** arose outside the scope of the CES, including issues with the proposal design itself, such as **budget constraints for physiotherapy sessions** and unrealistic target numbers. These external factors, while not directly related to the CES, impacted its effectiveness in practice.

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CES implementation

Regarding the implementation of the CES with participants, one of the most positive aspects highlighted was the **introduction of WhatsApp groups** for both participants and community managers. These groups facilitated open communication, allowing for the dissemination of updates, motivational messages, and important logistical information, such as venue changes due to weather or the introduction of new tools like the project App. Additionally, these groups fostered camaraderie among participants, creating a **social connection** and **peer motivation** that enhanced the overall experience.

The use of WhatsApp groups also proved efficient in saving time by allowing simultaneous communication with a majority of participants. Furthermore, **organising coffee meet-ups after classes** provided opportunities for social bonding, while physiotherapists incorporated fun exercises and games into sessions to encourage group cohesion. The choice of Kilkenny Castle Park as a venue was praised for promoting the idea of exercising in public green spaces as a normal activity.

On the other hand, CMs suggested some **actions that can improve CES** for future programmes. For example, the early involvement of local authorities in future projects in Munich to avoid issues like permit denials for using Public Urban Green Spaces, which limited outreach potential. The second pilot round was noted to be overly packed with activities, such as storytelling videos, App introductions, and surveys, which sometimes overwhelmed participants. Poor attendance during video production sessions was another challenge that may have affected engagement.

The introduction of the project App was particularly problematic. It was introduced late in the project, with participants only having access to it for a few weeks. Ideally, the App should have been introduced between the two programmes, perhaps during the pre-screening process for the second programme. The delay was attributed to issues with data protection impact assessments and ethical approvals, which also meant the App was not available for iPhones until late in the project. This timing issue was seen as a significant drawback, potentially impacting the project's overall results related to the App. Greater involvement of general practitioners, media, and pharmacies was also suggested to enhance prevention efforts.

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Expectations compliance

In relation to expectations compliance, CMs **generally expressed satisfaction with how their expectations were met,** particularly in terms of **Key Performance Indicators (KPIs)** such as recruitment, engagement, and retention. The CES played a crucial role as a guide for engaging senior citizens, fostering their involvement and ensuring a constant presence throughout the programme.

However, some managers noted that **external factors occasionally presented mild difficulties** during implementation. One of the primary issues mentioned again was the late introduction of the App, which hindered participant engagement. Additionally, longer recruitment periods could have potentially increased participation but were complicated by other ongoing projects in Bologna that involved some stakeholders. **Technical difficulties**, such as challenges with downloading the iOS version of the App, also arose due to inadequate instructions. These issues could have been mitigated if the App development process had been completed earlier, including a Data Protection Impact Assessment (DPIA) in the initial stages.

Participants benefit

CMs observed several **significant benefits among participants**. For one, the **improvement in physical fitness**, including balance, coordination, and strength. This physical enhancement was **complemented by the social benefits**, as participants formed strong bonds within the group, with some even meeting outside the programme. This social interaction contributed positively to their mental and social health, fostering a sense of community and socialisation.

The **professional guidance and quality control of the training sessions were also highlighted as key aspects for obtaining these benefits**. Participants felt motivated and supported in overcoming their fears, which helped increase their physical activity levels and time spent outdoors. The programme provided a safe and engaging environment that served as an external motivator, encouraging participants to maintain regular exercise routines. Being part of a group was a source of enrichment and well-being, with participants appreciating the pleasant setting, professional reception, and the formation of new personal relationships. Overall, **the UcanACT project not only enhanced physical health but also promoted mental and social well-being through community building and social interaction.**

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Participants adherence

Regarding adherence, CMs noted that the **programme was highly successful**, with only five out of fifty participants discontinuing in Kilkenny, one out of 47 dropping out in Munich and 6 out of 50 in Bologna. However, they suggested that **longer deadlines for dissemination and more physical activity sessions could enhance participation**. The **winter season impacted participation** in the second round, highlighting the need for flexibility in scheduling. To improve, they recommended a **larger budget for physiotherapists** to offer more flexible timing and locations for participants.

Achieving objectives

In terms of achieving objectives, the managers generally felt that the **programme's goals were met, especially among engaged participants**.

However, in ***Munich***, the target numbers were **not fully reached, which might have been due to external factors.** The effectiveness of communication tools was also praised, with **the introduction of a WhatsApp group being particularly successful**. It facilitated weekly communication between community managers and participants, ensuring timely updates on cancellations or changes. Nevertheless, some participants required additional outreach via other platforms like Signal or email, as they did not use Meta services.

To improve communication

To further improve communication, CMs suggested that having **a fully tested App ready before pilot rounds could enhance usability**. Additionally, they proposed **greater media dissemination**, including advertising in newspapers, radio, local cinema and social media platforms, and more collaboration with local councils, such as the Bologna City Council, to increase project visibility and engagement.

UcanACT App

According to CMs, the UcanACT App was **generally well-received by participants** who were technically capable of using it. Many found it helpful for continuing physical activity at home or in general, considering it a useful tool for maintaining exercise routines outside of sessions.

In terms of usability, CMs expressed that most participants found the App easy to use, though some iPhone users experienced difficulties during the download process.

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Suggestions for improvement included adding features like exercise safety tips and fall prevention recommendations. Additionally, integrating a "forget password" option was recommended to enhance user experience. The fact that the App was introduced late was brought up again also as a factor that hindered its uptake and effectiveness.

As CMs see it, the App's impact during sessions was variable. While it provided a structured overview of workouts that helped participants increase their physical activity levels outside of sessions, many prioritised interacting with the physiotherapist during sessions. Its role was seen as more beneficial after the sessions ended. In any case, the App did enhance engagement to some extent by motivating participants to exercise at home and facilitating communication through its chat function.

Additional information

Finally, as extra information, CMs suggested that **similar projects should be carried out to target other chronic diseases**, since this one generated great enthusiasm.

3.3 Comparison with PR1

Participants

The feedback from participants in the UcanACT project showed consistencies and notable improvements between the first pilot round and the second pilot round. **Participation increased in PR2** compared to PR1, and **satisfaction with the programme remained high,** with participants continuing to recommend it. The work of professionals, particularly **physiotherapists, was highly appreciated in both rounds,** reflecting their crucial role in the programme's success.

In both pilots, participants noted that physical activities were held outdoors across all territories. However, the **social aspect** of the programme was only mentioned in Kilkenny and Bologna during PR1, whereas in PR2, it was highlighted in all territories. A **significant improvement in PR2 was the emphasis on emotional benefits**, such as boosting morale, having fun, increasing motivation, and feeling secure. Participants felt empowered, noting that the programme helped them maintain independence and live at home rather than in a nursing home.

Organisational issues, including communication about session times and days, were **a concern in PR1 but improved in PR2**. Although participants in PR2 complained more

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about the timing of sessions due to daylight limitations, they generally found that weather conditions were less of an impediment compared to PR1. Both rounds saw participants requesting more classes and a longer programme duration. Exercises focusing on balance were praised in PR1, while balance and coordination exercises were highlighted in PR2. **In PR2, participants appreciated the exercises as challenging yet adapted to all participants, unlike in PR1 where some found them too simple.**

The **second pilot reported more benefits achieved through the programme compared to the first**. There were fewer complaints about completing questionnaires in PR2. Participants showed increased knowledge about staying active and maintaining health compared to PR1. **Engagement with physiotherapists also seemed to increase in PR2.** A **notable difference in PR2 was that participants made changes in their health-related behaviours as a result of the programme, which was not reported in PR1.**

The UcanACT App was only valued in PR1 by Bologna, as it was not available in other territories. In PR2, the App was introduced late in some areas, which might have affected user adherence. Various technical improvement suggestions for the App were noted. **Goals set by participants were only collected in PR2**, so their achievement will be evaluated in the quantitative analysis. Overall, PR2 demonstrated significant enhancements in both participant engagement and programme outcomes.

Professionals

The feedback from professionals from both pilot rounds reveals several key differences and improvements. **In PR2, both the MOOC and the PIM were positively evaluated across all territories**, whereas in PR1, they were only valued in Kilkenny. However, in PR2, some overlap between the MOOC and PIM was noted, with suggestions to create a more concise and visually appealing version.

Regarding programme implementation, PR2 saw improvements in communication through the use of WhatsApp compared to PR1. Additionally, the flexibility **introduced by physiotherapists in adapting exercises to participants' needs** helped prevent boredom, a notable enhancement from PR1. Despite these improvements, issues with patient attendance confirmation persisted in PR2. Another challenge in PR2 was adapting to different activity levels, which required adjusting planned activities. This was an improvement over PR1, where patient stratification was reported as confusing.

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Both pilots highlighted the positive benefits for participants, with more detailed feedback in PR2. There was a decrease in the number of professionals expressing concerns about excessive data collection and the utility of measures used to evaluate programme outcomes in PR2 compared to PR1. The UcanACT App was praised for its usability, but issues with resetting passwords and the downloading and installation process were reported in PR2, which were not mentioned in PR1, where it was evaluated only in Bologna.

Communication Managers

In comparing the feedback from communication managers between PR1 and PR2, several differences and improvements emerged. Notably, **managers highlighted an improvement in communication during PR2, particularly with the use of WhatsApp**, which was not a focus in PR1. This was made as suggested by participants in PR1, and had a really positive impact. Also, CMs **continued to express in PR2 the positive impact they thought the programme had on participants, especially in the area of socialisation**.

Maybe this was highlighted more in PR2, since an extra effort to emphasise this aspect was made, to foster engagement.

On the other hand, the **introduction of the UcanACT App in PR2 was met with challenges**, as it was implemented late in the process. This issue was not comparable to PR1, as the App was not available in the two territories where this was noted. Despite these challenges, the App was generally found to be easy to use although it did not fully meet CMs expectations.

Regarding expectations, the managers reported that their recruitment expectations were better met in PR2 compared to PR1. Additionally, **there was a noticeable improvement in adherence during PR2,** with fewer dropouts compared to the first round. However, financial issues arose in PR2, **specifically concerning the budget for paying physiotherapists**, which was not a concern mentioned in PR1.

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3.4 Compared results from participants, professionals and communication managers

To conclude this section, we would like to present a brief analysis of the main categories mentioned by the three groups that have participated in the UcanACT project, with the intention of providing a concise yet global view. However, we consider that perhaps here we can clearly observe the aspects that have been most important for all the people who have contributed to this project, and therefore, that best define it. We will highlight 3, since these are the ones that have been more widely mentioned throughout all Focus Groups:

- ✓ **Satisfaction**:
  - **Participants** expressed **high satisfaction** with the programme, praising the **quality of physiotherapists and trainers**, **exercise variety, social atmosphere, and organised structure**. Many regret its conclusion and wish to participate again.
  - **Professionals** also reported general satisfaction, noting **effective outdoor exercise implementation, improved participant confidence and physical skills, and socialisation**. However, they suggested improvements such as reducing repetitive information in educational materials and enhancing mobile App accessibility.
  - **Communication managers** praised the programme's success in citizen engagement, **effective WhatsApp communication, and participant benefits**, though they noted areas for improvement like delayed App introduction and increased local authority collaboration.
- ✓ **Socialisation aspect of the programme**. The programme's socialisation aspect was **highly valued by participants, professionals, and communication managers** alike
  - **Participants** enjoyed engaging in activities with others, fostering camaraderie, lasting **friendships**, and social networks.
  - **Professionals** noted that participants formed a **community**, building relationships that extended beyond the programme.
  - **Communication managers** highlighted the **success of WhatsApp** groups and public physical activities in promoting connection, mutual support, and mental well-being.

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✓ **Being outdoors**:

- **Participants** highlight the benefits of outdoor exercise, citing the **energising effects** of vegetation and oxygen, though weather can be a drawback.
- **Professionals** view outdoor exercise as a programme **strength**, enhancing group dynamics, **quality of life**, and overall well-being.
- **Communication managers** note that exercising in public spaces like Kilkenny Castle Park effectively normalized physical activity, creating a **visible and positive experience** for participants.

In the following comparative table (Table 16), we present other common themes including the **benefits obtained by participants**, the **need for earlier introduction of the App,** and the **effectiveness of structured exercise sessions**, with the 3 main categories already discussed.

Aspect	Participants	Professionals	Communication Managers
Programme Enjoyment	Very high satisfaction, enjoyable, and motivating.	Generally satisfied with the exercise programme.	Successful implementation, met expectations.
Socialisation	Formed new relationships, enjoyed group dynamics.	Fostered community and friendships.	Encouraged social connections through WhatsApp groups.
Outdoor locations	They felt energised and motivated to get out more.	Positive effect on group dynamics and improves quality of life.	Normalised physical activity in public spaces.
Exercise Benefits	Improved physical health, balance, strength, and mental well-being.	Improved balance, agility, and confidence.	Physical fitness improvements, social health benefits.
Communication Tools	Mixed feedback on WhatsApp; some found it useful, others had issues.	Effective use of WhatsApp for communication.	WhatsApp groups were a game-changer for communication.

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Aspect	Participants	Professionals	Communication Managers
Programme Structure	Appreciated the structured sessions, twice a week.	Effective class structure, adaptable to participants' needs.	Successful recruitment and engagement strategies.
App Usefulness	Generally, found the App useful but introduced too late.	Easy to use, but introduced too late.	Well-received by those who could use it, but late introduction was a drawback.
Improvement Suggestions	More variety in exercises, better timing for App introduction, and improved communication.	Increase balance exercises, improve App timing.	Earlier App introduction, more involvement from local authorities.

Table 16: Summary of the main categories that arose from the analysis of the qualitative data.

4. Limitations of the UcanACT Programme

While the programme's development has shown promising and beneficial results for all participants, based on the results presented, it is not without limitations that may have diminished its potential effectiveness.

On the one hand, we must highlight the difficulties experienced **by participants**, whose recruitment has been complicated given the eligibility criteria, especially those undergoing cancer due to fear in some cases, lack of information in others, or the situation in their recovery process in many others. Their attendance has been hampered in many cases due to lack of time. For those included in the programme, attendance and adherence to the programme have also been difficult in some cases due to lack of time, weather problems, or access to open spaces.
All these situations have complicated the possibility of obtaining more complete and homogeneous data, since, firstly, it has been difficult to obtain a large number of participants diagnosed with cancer, and secondly, data completion has been difficult, encountering a technological barrier in some cases.

This **technological barrier** extends to the use of the App, which has not been easy to develop, taking into account all the intervention needs, the requirements expressed by

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the participants, and in some cases, difficulties in its use due to difficulties with these technological skills.

On the other hand, from the **professionals' perspective**, it has not been easy to include them in the programme, in many cases due to a lack of time and in others due to a lack of resources.

5. Conclusions

Participants in the programme, both those with a history of cancer and those without, expressed a high level of overall satisfaction. This positive feedback is reflected in several key areas:

1. Overall Satisfaction with the Programme

- Participants highlighted the programme's structure, accessibility, and the sense of community it fostered.
- The personalised adaptation of exercises to individual capabilities was especially appreciated, promoting adherence and motivation.

2. Professionalism and Empathy of the Physiotherapists

- Physiotherapists were highly praised for their compassionate approach, technical expertise, and ability to build trust.
- Their skill in tailoring exercises to the specific needs of each participant, particularly those with cancer, was especially valued.

3. Outdoor Exercise Sessions

- Sessions held in open-air environments were perceived as energising and motivating.
- Contact with nature, sunlight, and fresh air significantly contributed to participants' emotional and physical well-being.

4. Perceived Benefits

- **Physical**: improved mobility, strength, endurance, and reduced fatigue.
- **Psychological**: enhanced mood, reduced stress, and improved self-esteem.
- **Social**: strengthened social bonds and a sense of belonging to a group.

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6. Recommendations after the UcanACT pilot rounds

Given the high level of satisfaction and the reported benefits, it is recommended to **continue and expand the programme**, with special emphasis on:

- Maintaining and increasing outdoor sessions.
- Ongoing training and support for physiotherapists.
- Promoting the inclusion of individuals with diverse health conditions, encouraging an integrative and personalised approach supervised by physiotherapists.

This programme not only improves physical health but also strengthens the emotional and social well-being of participants, making it a valuable tool in community health strategies.

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