Prehabilitation for cancer patients who live in a remote, rural or island location in the Highlands of Scotland

Trish Gorely, Nicola Carey, Pamela McKay, Megan Dickson

University of the Highlands and Islands

October 2025

1.0 Introduction

Cancer rates are increasing globally. Effective solutions are required to help enable people with cancer to adopt self-management behaviours both before (prehabilitation) and after (rehabilitation) their treatment that enhance their recovery.

Prehabilitation interventions for patients who have a cancer diagnosis are designed to boost patient readiness for surgery and cancer treatment from the point of diagnosis focusing on enhancing a patient's physical and psychological readiness for treatment before it begins. This proactive strategy typically involves tailored exercise programs, nutritional support, and psychological interventions aimed at improving overall health, reducing treatment-related complications, and speeding up recovery[1-3].

Prehabilitation empowers patients to improve physical fitness, maintain function, and potentially improve treatment adherence, outcomes, along with reducing treatment side-effects, improving quality of life, as well supporting early identification of modifiable risk factors[3-5]. Prehabilitation appears to benefit cancer patients with systematic reviews and meta-analysis demonstrating positive benefits in different cancer populations including: improvements in functional capacity, quality of life, fatigue, and psychosocial variables and decreases in length of hospital stay and post-surgery complications[4, 6].

Integrating prehabilitation into cancer care pathways represents a shift toward a more holistic, patient-centred model of care that supports individuals not just through treatment, but from the very start of their cancer journey[1]. Implementing prehabilitation in cancer care presents several challenges, including timing and diagnosis uncertainty, variation in cancer pathways, resource constraints, patient readiness and engagement, a lack of awareness and training, and equity of access.

Socioeconomic, cultural, and geographical barriers can limit access to healthcare including prehabilitation services, raising concerns about health inequalities. Addressing these challenges requires coordinated efforts across healthcare systems to embed prehabilitation into standard cancer care, supported by research, policy, and education.

Accessing healthcare in remote and rural Scotland presents a range of challenges i.e. geographic isolation, workforce, service availability, digital connectivity issues, that impact both patients, service delivery and equity in access that can result in health inequalities [2, 3, 7, 8]. There is little evidence regarding the implementation of prehabilitation services for patients with a cancer diagnosis in remote and rural locations in Scotland. Without this and with continuing barriers, they may be little incentive to fund prehabilitation services for patients with a cancer diagnosis. To optimise the opportunity that prehabilitation can offer it is important to understand barriers and facilitators to implementation to inform the care pathway and improve the treatment and management process for patients and providers of primary, secondary and tertiary health care.

1.1 Aim

The aim of this service evaluation was to develop a better understanding of the preferences, experiences, barriers and facilitators for participation in prehabilitation for cancer patients living in remote and rural areas of the Highlands and Islands.

This aim was addressed in two phases:

Phase 1: Rapid review of the literature;

Phase 2: Qualitative exploratory study of people living with a cancer diagnosis.

The methods and findings from each phase are described in the following sections.

2.0 Phase 1: Rapid Review

2.1 Aim

The aim of the rapid review was to identify barriers and facilitators to the participation in prehabilitation programs for patients who had received a diagnosis of cancer.

2.2 Methods

A rapid review and narrative synthesis of evidence published between 2020-2024 following PRISMA[9].

2.2.1 Definition of key terms

Prehabilitation: activities or programmes that are designed to boost patient readiness for surgery and cancer treatment from the point of diagnosis focusing on enhancing a patient's physical and psychological readiness for treatment before it begins. May involve tailored exercise programs, nutritional support, and psychological interventions aimed at improving overall health, reducing treatment-related complications, and speeding up recovery[1-3].

Barriers: any type of obstacle (material or immaterial) which can impede the adoption, implementation and/or sustainability of prehabilitation for patients who have received a diagnosis of cancer[10].

Facilitators: any factor (material or immaterial) which can enhance implementation or help overcome barriers to adoption, implementation and/or sustainability of prehabilitation for patients who have received a diagnosis of cancer[10].

2.2.2 Search Strategy

Targeted searches of PubMed and Medline were conducted using index/ MESH headings and strings for the following key terms ‘Cancer’, ‘prehabilitation’, ‘patient experience’, ‘barriers’ and ‘facilitators’ were undertaken in October 2024. Manual searches of included papers and any systematic reviews were conducted to identify any additional papers. Updated searches conducted in February 2025 did not yield any further articles. A specialist librarian was consulted to develop the search strategy.

2.2.3 Eligibility criteria

To be included in the review papers had to meet the following inclusion criteria:

- original full text research article from any country
- qualitative study design reporting patient and or HCP/carer perspectives of facilitators or barriers to prehabilitation
- patient group had a cancer diagnosis (any cancer)
- study participants aged >18 years
- articles published in English
- published in 2020 or later

Articles that did not report empirical qualitative research (i.e. opinion pieces, conference abstracts, discussion papers, literature reviews, randomised controlled trials, protocol papers, clinical outcomes, editorials and grey literature) were excluded.

2.2.4 Study Selection and Screening

Search results were managed using Rayyan software[11] and duplicates were removed before any screening took place. A two-stage process was followed for screening. In stage 1 titles and abstracts were screened by at least two members of the research team (PM, TG, NC) to exclude studies that did not meet the inclusion criteria. In stage 2 the full-text articles were retrieved and screened against the eligibility criteria by at least two members of the research team (PM, TG, NC). All reviewers confirmed eligibility of the identified studies. Discrepancies were resolved during research team meetings.

2.2.5 Data Extraction

Data extraction was conducted independently by three team members (PM, TG, NC) using a bespoke data extraction tool. Data extracted included study design, focus of the interviews, participant characteristics (gender, age, cancer type), whether they had taken part in prehabilitation, prehabilitation content (if applicable), barriers to prehabilitation, and facilitators to prehabilitation.

2.2.6 Synthesis

A thematic analysis looking for recurring patterns and themes across studies was conducted.

2.3 Results

2.3.1 Study selection

Figure 1 provides an overview of the study selection process. A total of 1663 studies were identified by the searches after duplicate removal, 291 full-text articles were screened, and 13 papers met the eligibility criteria[12-24]. These 13 papers represented 11 projects. From these 11 projects, data were available on 12 independent samples, as the two papers by Powell et a [19, 20] report different aspects from the same set of interviews. However, the two papers from the Beck et al project[15, 24] report on interviews undertaken at different phases of the intervention development and therefore represent independent samples.

2.3.2 Study characteristics

The characteristics of the 12 independent samples (k) are detailed in Table 1 and described briefly below. A total of 301 participants were interviewed or took part in focus groups: 191 patients, 59 healthcare professionals (HCPs), and 34 family members or informal caregivers. Participants were from England (k=3)[13, 16, 19, 20], Netherlands, Denmark, Canada (all k=2)[12, 14, 15, 21, 23, 24], Sweden, Ireland and USA (all k=1)[17, 18, 22].

The age of patient participants varied, with the mean/median age being between 58 and 72.7 years across 10 of the independent samples, and not available in the other 2. All projects included both male and female patient participants, and overall 43% of patient participants were female. Participants were living with a variety of cancers, including colorectal, ovarian, oesophageal, lung, and bladder. The majority of patient interviews/focus groups (74%) took place post-operatively/after treatment started, 20% took place preoperatively, and in 5% of participants it was unclear. In 7 independent samples participants were discussing their experiences of a specific prehabilitation programme. Five of these programmes were focused on physical activity or exercise, and three were multimodal. Participants in one sample received information describing the purpose, components, dose, schedule and mode of delivery of exercise prehabilitation in advance of completing the survey and subsequent interview, but it is not clear whether they were asked to undertake the exercise. Participants in the remaining 4 independent samples had no formal experience with prehabilitation. The majority of interviews/focus groups focused on PA/exercise during the prehabilitation period (k=9) with only 3 discussing broader prehabilitation.

Figure 1: PRISMA flow diagram of included studies

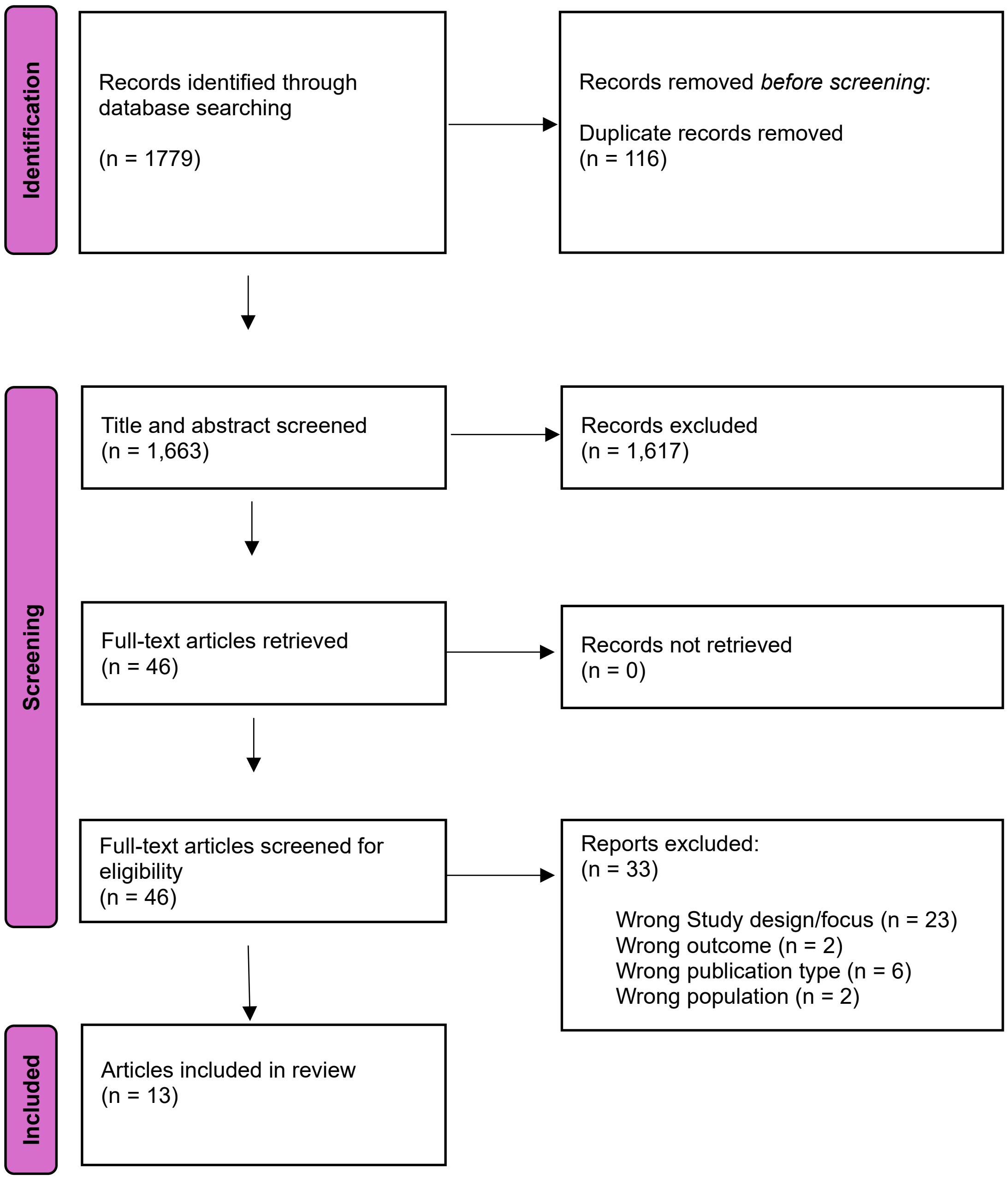

Table 1: Characteristics of included studies

Author and country	**Design**	**Focus of interviews**	**Undertaken Prehabilitation**	**Sample**	**Cancer Type**	**Gender**	**Age**
Agasi-Idenburg, Koning-van Zuilen, Westerman, et al.(2020)[12] Netherlands	In-depth interviews Conducted patient interviews post-surgery (n=13) or pre-op (n=2)	barriers to, facilitators of, and preferences for **exercise in the preoperative phase**	No	N=37 Patients (n=15) Physiotherapists (n=9) Informal care givers (n=13)	Colorectal Cancer	Patients: Female n=4 Male n=11 Physiotherapists: Female n=5 Male n=4 Informal care givers Female n=10, male n=3	Patients: Mean (SD): 72.7 (4.39) yrs Physiotherapists: Mean (SD): 42 (9.96) yrs Informal care givers Mean (SD): 68.1 (11.98) yrs
Banerjee, Semper, Skarparis, et al (2021)[13] England	Focus groups (n=3) Conducted at least 6 weeks after surgery	explore patient perspectives of **preoperative high intensity (HIIT) aerobic interval exercise** before radical cystectomy	Yes Patients had undertaken a preoperative HIIT program	Patients (n=14)	Bladder cancer	Female: n=1 Male: n=13	Mean (SD): 72.3 (6.0) yrs Range: 64-82 yrs
Barnes, Hladkowicz, Dorrance, et al. (2023)[14] Canada	Nested descriptive qualitative study within a single centre, parallel-arm, RCT of home-based exercise prehabilitation (the PREHAB Study) Semi-structured phone interviews Conducted during final week in the prehab program (ie the week before surgery)	the barriers and facilitators of participating in **exercise prehabilitation** from the perspective of older adults with frailty	Yes Patients had recently completed a prescribed prehabilitation program	Patients (n=15)	intraabdominal, intrathoracic and pelvic cancer	Female: n=8 Male; n = 7	Mean: 72 yrs Range: 60-85 yrs

Author and country	**Design**	**Focus of interviews**	**Undertaken Prehabilitation**	**Sample**	**Cancer Type**	**Gender**	**Age**
Beck, Thaysen, Soegaard et al, et al. (2021)[24] Denmark	Semi-structured interviews, as part of development and feasibility stages of a preoperative leaflet Conducted interviews post-operatively on ward (n=30) or at home (n=1)	understanding perspectives on and acceptability of prehabilitation among patients undergoing complex abdominal cancer surgery, in order to enhance patient centredness in relation to prehabilitation	Yes Patients received a leaflet with home-based, preoperative recommendations. Multimodal.	Patients (n=79) Interview n=31 Leaflet n=53 (5 patients did both)	Colorectal or Ovarian	Interviews: Female (n=19) Males (n=12) Leaflet Female n=46 Male n=7	Interviews M = 60 yrs Leaflet M = 62 years (no additional info)
Beck, Thaysen, Soegaard et al, et al. (2022)[15] Denmark	Sem-structured interviews Conducted interviews post-operatively on ward (n=15) or at home (n=1)	Experiences, thoughts, and feelings that underlie and influence actions or the lack of actions in relation to prehabilitation among cancer patients due to undergo major abdominal surgery	Yes Patients received a leaflet with home-based, preoperative recommendations. Multimodal.	Patients (n=16)	Colorectal or Ovarian	Female (n=11) Male (n=5)	Median 58 yrs
Cooper, Chmelo, Sinclair, et al. (2022)[16] England	Semi-structured interviews (n=5) or focus groups (4) (n=17) Conducted post surgery	identify factors influencing uptake, engagement and adherence to the ChemoFit Intervention	Yes Participants had taken part in a pre-surgical home based **physical activity and exercise** intervention (ChemoFit)	Patients (n=22)	Oesophageal	Female n=4 Male: n=18	Mean (SD) : 67.3 (8.2) yrs

Author and country	**Design**	**Focus of interviews**	**Undertaken Prehabilitation**	**Sample**	**Cancer Type**	**Gender**	**Age**
Karlsson, Dahl, Rydwick et al. (2020)[17] Sweden	Semi-structured interviews Conducted at the end of the waiting period, i.e., close to surgery	older people's attitudes and perceptions towards **physical activity and exercise** when scheduled for colorectal cancer surgery no specific prehab program discussed		Patients (n=17)	Colorectal	Females: n=8 Males: n=9	Median: 75 yrs Range: 70–91
Paulo, Ali, Schmeusser, Midenberg, et al. (2023)[18] USA	Semi-structured interviews (phone) Conducted post operatively (n=11) or preoperatively (n=9)	to explore barriers and facilitators to **PA prehabilitation** in preoperative kidney cancer patients	Yes participants had taken part in either an exercise/frailty regime (n=4) or a nutrition/frailty regime (n=16)	Patients (n=20)	Kidney	Females: N=8 Males: N=12	Mean: 62yrs Range: 23-81 yrs
Powell, Davies, Rowlinson-Groves, French, et al. (2023a)[19] Powell, Davies, Rowlinson-Groves, French, et al. (2023b) [20] England	Patients: interviews (phone/video call) HCP (online survey) Conducted patient interviews after surgery	how patients with colorectal, lung or oesophago-gastric cancer perceived a supported **physical activity** prehabilitation and recovery programme and to identify facilitators and barriers to engagement	Yes Patients had participated in the Greater Manchester Cancer Alliance Prehab4Cancer and Recovery Programme (P4C Programme)	Patients (n=18) (16 engagers, 2 non-engagers) HCP: (n= 24) (7 Doctors, 11 nurses, 4 others)	colorectal, lung or oesophago-gastric Cancer	Patients Female n=9 Male n=9 HCP: Female n=16 Male n=4	Patients; Median 68.5 yrs range 40s to 80s HCP: Median 44 yrs range 30s to 50s)

Author and country	**Design**	**Focus of interviews**	**Undertaken Prehabilitation**	**Sample**	**Cancer Type**	**Gender**	**Age**
Purdy, Nanad, Dolgay, et al. (2023)[21] Canada	2-phase sequential mixed methods* using (1) cross-sectional survey and (2) focus groups (n=2, online) Conducted after stem cell transplantation treatment	participant preferences, barriers, and facilitators to **exercise programming** prior to stem-cell transplantation	Unclear	Patients: Survey n =26 Focus groups n=11 (also contributed to survey)	Leukaemia (n=2), lymphoma (n=2), or multiple myeloma (n=22)	Not stated	Most participants were between 55-69 years (n=19) Range 26-70+
Smyth, Brennan, Enright, Sekhon, et al. (2024)[22] Ireland	Exploratory mixed-methods* using (1) questionnaire (2) semi-structured interview (with participants from questionnaire) Conducted with patients who were waiting on or who had undergone oncological resection in the last 12 months	acceptability of **exercise prehabilitation** among key stakeholders relevant to surgical prehabilitation, including patients, their families and healthcare providers	Unclear patients had received an infographic or animation describing the purpose, components, dose, schedule and mode of delivery of exercise prehabilitation in advance of completing the survey	Questionnaire n=244 (Patients n=101; family members n=39, HCPs n=100; other n=4) Interviews n=31 (also contributed to questionnaire) (patients n=12; family members n=5; HCPs n=14 - 5 Anaesthetists, 3 General practitioners, 1 intensive care consultant, 5 physiotherapists)	Mixed	Not stated	Questionnaire mean (SD) Patients: 54.0 (14) yrs Family members 41.2 (15) yrs HCP: not stated Interviews – no age data given

Author and country	**Design**	**Focus of interviews**	**Undertaken Prehabilitation**	**Sample**	**Cancer Type**	**Gender**	**Age**
Voorn, Bastiaansen, Schröder, van Kampen-van den Boogaart, Bootsma, Bongers, et al.(2023)[23] Netherlands	Semi-structured interviews with HCP, patients and informal caregivers Condcuted with patients who were within 30 days after surgery	beliefs, facilitators, and barriers of 1) healthcare professionals to refer patients to a prehabilitation program, 2) patients with NSCLC to participate in and adhere to a prehabilitation program, and 3) informal caregivers to support their loved ones in prehabilitation	No	HCP (n=12), patients (n=17) informal caregivers (n=16)	Non small cell lung cancer	HCPs Female (n=9) Male (n=3) Patients Female (n=7) Male (n=9) Informal caregivers Female (n=8) Male (n=7)	HCPs Median 44yrs (range 24–64 yrs) Patients: median 65 yrs (range 51–85 yrs) Informal caregivers median 62 yrs (range 21-84 yrs)

* Only qualitative phase data included in review

2.3.3 Barriers to participation in prehabilitation

Table 2 shows the barriers to participation identified through the review. Barriers have been grouped under 5 themes: physical factors, psychological factors, life factors, Healthcare professional factors, and environmental factors and other factors.

Physical Factors: The most common cited barrier was the symptoms of cancer (k=7) which hindered or prevented take part in prehabilitation activities[12, 14, 16, 17, 19-21, 24]. These symptoms alongside any effects of treatment (e.g., tiredness, nausea(k=5))[12, 15-17, 19, 20] or existing co-morbidities (e.g., osteoarthritis (k=5))[12, 13, 16, 17, 19, 20] limited participation. A further suggested barrier was the need to conserve energy until after the surgery (k=1)[16].

Psychological factors: A number of psychological factors were reported as potential barriers to participation in prehabilitation. The most common was a lack of confidence or belief in their physical abilities to perform exercise or physical activity (k=5) [15-20] and this may be associated with a fear of physical activity (k=1)[17]. Doubts were also expressed about the effectiveness of physical activity or prehabilitation (k=4)[16-18, 22]. These were sometimes linked to the short prehabilitation window creating doubt whether there was time for any prehabilitation activity to make a difference. Others felt they did not need the prehabilitation (k=4) as, for example, they felt they were already sufficiently active or they had recovered well from a previous surgery without having done prehabilitation[12, 16, 24]. The psychological impact of the diagnosis and a feeling of being overwhelmed was reported as a barrier to participation (k=4)[12, 17-20]. Alongside this poor mental health and experiencing stress and anxiety limited/prevented participation (k=3)[17, 22, 24]. It was also suggested that the pre-operative period was the last time to 'live normally' and any facility based prehabilitation would disrupt this (k = 2)[14, 24]. Negative emotions associated with guilt and frustration when unable to exercise or take action were also reported as barrier (k=2)[13, 24]. Several potential psychological barriers were reported in single papers and are listed in the table 2.

Life factors: Having other priorities during the prehabilitation period was frequently reported as a barrier (k=6) [14, 16, 17, 21, 22, 24] , and this may be exacerbated by a short pre-operative/pre-treatment phase (k=5)[12, 16, 17, 22, 24] during which participants prioritise other activities and feel there is a lack of time to fit physical activity/exercise in (k=3)[16, 17, 24]. The number of medical appointments to attend during this time may also contribute to a sense of lack of time (k=2)[12, 22].

HCP factors: Poor communication from HCPs (k=2) [16, 18] was perceived as a barrier and this might be reflected in a sense that prehabilitation was not prioritised during conversations with staff (k =1)[21] or a lack of support (k =1)[22]. A perception of a lack of resource or staff behind prehabilitation was a barrier to staff promoting prehabilitation (k=2)[19-21] .

Environmental and other factors: Challenges accessing facilities or equipment were cited as barriers, with travel often being the cause (k=5)[13, 17, 18, 21, 22] . Weather, either hot, cold or wet, was perceived as a barrier (k=2)[13, 16] as were exercise programmes that were perceived as lacking variety or boring (k=2)[13, 15]. A number of other potential barriers were reported in single papers and are listed in the Table 2.

2.3.4 Facilitators of participation in prehabilitation

Table 3 shows the facilitators to participation in prehabilitation identified through the review. Facilitators have been grouped under 6 themes: beliefs, physical activity experience, Healthcare professional factors, social support, program features, psychological factors, and physical activity adherence factors.

Beliefs: The belief that prehabilitation would have a positive impact on their recovery emerged as a facilitator in 11 of the studies[13-24]. These beliefs were the second most common facilitator across the review and were a motivator to take part and do anything the participant thought would lead to better outcomes. These beliefs linked in some studies to previous experience of exercise and/or knowledge of the health benefits of exercise.

Physical activity experience: Previous experience of physical activity influenced participation (k=4)[12-14, 17]. Participants who had previously experienced benefits from physical activity indicated that this motivated them, made it easier to start when they were unwell, helped them take part or be open towards conducting preoperative physical exercise. Already taking part in physical activity/exercise was also a facilitator (k=2) with these participants continuing on with their lifestyle[12, 18].

Healthcare practitioner factors: Support from healthcare professionals was identified as an important facilitator in all studies (k=12) [12-24]. This factor includes the importance of the HCP introducing and endorsing the programme, providing encouragement to take part, and, providing ongoing support for participation. Others (k = 2) emphasised the importance of the relationship between the HCP and the patient in the decision to take part or not, with this facilitator focusing on trusting the knowledge of the HCP, and at times a sense of obligation or wanting to please the HCP [12, 16]. Another potential facilitator was a sense of collaboration and mutual goal setting with the HCP (k=2) [15, 24]. Several potential HCP facilitators were reported in single papers and are listed in the Table 3.

Social Support: The importance of social influence and support from family and friends was a common facilitator (k=6) [13, 14, 17, 18, 21, 23]. The possibility for both practical and emotional support was valued (k=2) [12, 17]. The opportunity for interaction with other patients was reported as a potential facilitator (k=3)[12, 13, 21], however, in one paper[12] there was some contention around this with HCPs considering the support of fellow patients important but many patients and their caregivers seeing the experiences of fellow patients as being irrelevant or even a barrier. A further support facilitator was having someone with you when the intervention was described, but this was only mentioned in one paper[16] .

Program Features: A number of program features have the potential to influence participation. Being home based was commonly identified (k=5) [14-16, 23, 24] and was considered favourably as it fitted in with their own context, cut down on cost, travel and time, felt safer for patients with physical symptoms (e.g., nausea or diarrhoea) and for those struggling with psychological issues, and, for some, home-based activity reduced the potential for competitiveness and self-consciousness. Opportunities to tailor or individualise the physical activity or prehabilitation programme to their needs and preferences (k=4) [14, 17, 22, 24] and the setting of attainable goals (k=3) appeared to facilitate participation[14, 16, 21]. The opportunity to complete exercises with another person supported motivation and participation (k=3) [14, 18, 23]. The capability to be able to make the time to participate in exercise or prehabilitation activities was an important consideration (k=2)[17, 23]. Several other program features which were potential facilitators were reported in single papers and are listed in the Table 3.

Psychological factors: A common facilitator was the sense of having something positive to do in the window before treatment/surgery that gave a sense of control or taking an active role in their treatment/recovery (k=7) [13-16, 21-23]. The potential for psychological benefits such as a reduction in stress and anxiety or improved mood (k=2)[17, 22]and having confidence in their abilities to undertake prehabilitation activities (k=2)[17, 23] also emerged as potential facilitators. A number of other psychological factors which were potential facilitators were reported in single papers and are listed in the Table 3.

Table 2. **Barriers to participation in prehabilitation**

		Study											Total
	Study number *(see key at bottom of page)*	1	2	3	4	5	6	7	8	9	10	11	
Physical factors	Cancer or physical symptoms	x		x	x		x	x		x	x		7
	Cancer treatment	x				x	x	x		x			5
	Co-morbidities/preexisting conditions	x	x				x	x		x			5
	Need to conserve energy until after surgery						x						1
Psychological factors	Lack of confidence/belief in physical abilities					x	x	x	x	x			5
	Doubt relating to effectiveness of physical activity or prehabilitation						x	x	x			x	4
	Feeling overwhelmed/Impact of diagnosis	x						x	x	x			4
	Lack of need/benefit	x			x		x					x	4
	Poor mental health				x			x				x	3
	Preop period was their last chance to feel normal			x	x								2
	Negative emotions when unable to participate or take action		x		x								2
	Burden of participating										x		1
	Limited knowledge about how they should have exercised									x			1
	Fears about PA							x					1
	Human laziness						x						1
Life factors	Other priorities			x	x		x	x			x	x	6
	Preoperative time	x			x		x	x				x	5
	Lack of time to fit in PA				x		x	x					3
	Number of Medical appointments	x									x		2
HCP factors	Poor /no communication/supervision (HCP)						x		x				2
	Lack of resources/ Staff									x	x		2
	Prehabilitation not prioritised during conversations with staff										x		1
	Lack of HCP support									x			1
Environmental and other factors	Access to Facilities/equipment/travel		x					x	x		x	x	5
	Weather		x					x					2
	A lack of variety of exercises/boring		x			x							2
	Retention of information					x							1
	Previous negative experience/ Expectations of exercise						x						1
	Other limiting factors (IV)									x			1
	A need to spare the family from fear or worry/not be a burden				x								1
	Moving from rural to urban areas						x						1
	Unsupervised physical exercise training at home											x	1

Key: 1= Agasi-Idenburg *et al*. (2019); 2 = Barnes *et al*. (2023); 3= Beck *et al*. (2021a); 4= Beck *et al*. (2022); 5 = Cooper *et al*. (2022); 6 = Karlsson *et al*. (2019); 7 = Paulo *et al*. (2023); 8 = Powell *et al*. (2023a, 2023b); 9 = Purdy *et al*. (2023); 10 = Smyth *et al.* (2024); 11 = Voorn *et al*. (2023)

Table 3: Facilitators to participation in prehabilitation

		Study												Total
	Study number *(see key at bottom of page)*	1	2	3	4	5	6	7	8	9	10	11	12	
Beliefs	Positive impact on post operative recovery		x	x	x	x	x	x	x	x	x	x	x	11
	Understanding/Knowledge of Health benefits	x	x											2
PA Experience	Previous experience of PA	x	x	x				x						4
	Already active, and continued	x							x					2
HCP Factors	Support from HCP	x	x	x	x	x	x	x	x	x	x	x	x	12
	Collaboration with HP				x	x								2
	Relationship between HCP and Patient		x				x							2
	Short lines of communication between patient and HCP												x	1
	Receiving information about preparing for surgery												x	1
Social support	Support from family/ friends		x	x				x	x		x		x	6
	Peer support/ people with same issues	x	x								x			3
	Practical and emotional support	x						x						2
	Having someone with you with the intervention is described is beneficial.						x							1
Program features	Home based			x	x	x	x						x	5
	Tailored to individual capabilities			x	x			x				x		4
	Attainable goals			x			x				x			3
	Completing exercise with another person			x					x				x	3
	Time set aside for exercise/prehabilitation							x					x	2
	Teaching/ resources to support engagement			x										1
	Program was easy to follow			x										1
	Ability/convenience to fit PA into daily life					x								1
	Freedom to choose actions so they would not fail				x									1
	Supervised exercise sessions experienced in PA and cancer								x					1
	Face to face contact with a physical therapist												x	1
	Exercise behaviour education								x					1
Psychological factors	Having something positive to do in the window before treatment/surgery		x	x		x	x				x	x	x	7
	Psychological benefits							x				x		2
	Confidence in one’s own abilities							x					x	2
	Thoughts of family and friends are a motivator to surviving operation						x							1
	Holistic health, including psychological counselling								x					1
	Enjoyment and satisfaction from taking part			x										1
	Psychologist input												x	1
	Previous experience of surgery influenced perceptions of prehabilitation value									x				1

Key: 1= Agasi-Idenburg et al. (2019); 2 = Banerjee et al (2019); 3 = Barnes et al. (2023); 4= Beck et al. (2021a); 5= Beck et al. (2022); 6 = Cooper et al. (2022); 7 = Karlsson et al. (2019); 8 = Paulo et al. (2023); 9 = Powell et al. (2023a, 2023b); 10 = Purdy et al. (2023); 11 = Smyth et al. (2024); 12 = Voorn et al. (2023)

2.4 Summary

- A number of barriers and facilitators were identified and these were often interlinked, and varied by individual circumstance. Prehabilitation will need to be flexible to address individual circumstance
- Patients need to believe that there will be a positive effect from prehabilitation on postoperative/posttreatment outcomes, but how this is achieved is not widely understood
- In the pre-treatment window participants often report being busy and having other priorities (functional and social) that took precedence over prehabilitation activities
- The window of opportunity is often short and this influences beliefs about effectiveness and value
- Having support from a HCP is fundamental, but concerns were raised about it not being prioritised during consultations or getting lost amongst a vast amount of information that is provided in a short space of time and at a time when they may be 'in shock'
- The impact of cancer symptoms and comorbidities should not be underestimated as a barrier
- There is a lack of consensus around what elements would be necessary for effective prehabilitation, and what dose of prehabilitation is needed. Flexible, individualised delivery is preferred.
- Although there was support for home-based prehabilitation, there was recognition that centre based programmes may be appropriate for some people

3.0 Phase 2: Qualitative exploratory study of people living with a cancer diagnosis

3.1 Aim

The aim of Phase 2 was to explore experiences and preferences regarding prehabilitation for people living with a cancer diagnosis in remote and rural areas of the Highlands and Islands.

3.2 Objectives

- Explore the perspectives and experiences of individuals living with a cancer diagnosis in relation to prehabilitation.
- Identify barriers and facilitators to participation in prehabilitation for people with a cancer diagnosis who live in remote and rural areas of the Highlands and Islands

3.3 Methods

3.3.1 Sampling

A purposive sample of people (>18 years of age) living with a cancer diagnosis, of at least 6 months and no more than 2 years, in remote and rural areas of Scottish Highlands and Islands and English speaking. People still receiving acute treatment e.g. waiting for surgery, or without capacity or those experiencing significant mental health difficulties (e.g. anxiety, panic attacks, uncontrolled depression) were excluded. This was due to the nature of the discussions that may take place that could potentially exacerbate any mental health distress.

In our original proposal we estimated that we would undertake 6-8 focus groups of 4-6 people (total n= 40). Due to the low number of people recruited, the focus shifted to undertaking semi-structured interviews with lower uptake overall, with a total 10 interviews being conducted.

3.3.2 Participant recruitment

Initial recruitment was undertaken via The North Cancer Alliance (NCA) who cascaded invitations and/or posters advertising the project through established networks of third sector and community organisations. Each organisation was asked to distribute invitations to members via regular newsletters, and or display the project poster on webpages, social media and or physical wall space with links to an invitation email and participation information sheet provided.

Due to slow uptake recruitment was supplemented by study promotion via UHI communications, UHI social media accounts, local community and island Facebook groups and follow-up emails to the local Health boards, third sector and community organisations and direct contact to local cancer and palliative care services by the study team.

Potential participants (n= 18) who responded to the above, or attended local community hubs on Shetland were provided with an information sheet, explaining the study and what involvement would entail. Potential participants were provided with the opportunity to ask any questions and underwent screening to ensure they met the eligibility criteria. The consent process was carried out by a trained researcher via teams, telephone call or face to face with the person in the community hub setting. Once consent was confirmed a suitable time and date, for the interview was arranged.

3.3.3 Interview/focus group schedule

Informed by the previous work in prehabilitation with cancer patients and phase 1 review findings an interview schedule (see Appendix B) was developed which contained questions to capture the experiences of people diagnosed with cancer between the point of diagnosis and the beginning of treatment regarding their prehabilitation experience, preparation, if any, for treatment/surgery, thoughts and feelings during that time, benefits, disadvantages, and contact with HCPs. Those who had experience of formal prehabilitation programmes were asked to reflect on the content of their programme, and motivation to participate. Those with no prehabilitation experience were asked to consider what they understood about it, and what might motivate or discourage them from taking part.

3.3.3.1 Pilot

The interview schedule was reviewed by the research team and the North Cancer Alliance. The interview schedule was piloted on one person with cancer diagnosis who lived in more urban area. The pilot interview was included in the analysis as it provided valuable insights. No changes were made to the interview schedule as a result of the pilot interview.

3.3.4 Ethics

Ethical approval for Phase 2 was obtained from the University of the Highlands and Islands ethics committee in February 2025 (ID: ETH2425-0690). Recommended procedures for recruiting participants and obtaining informed consent were followed. Participants were made aware of right to withdraw and told study participation, or withdrawal, would not affect NHS service provision or employment. Where possible, study information was sent in advance to all potential patient participants.

3.3.5 Data collection and analysis

Interviews were conducted at mutually convenient time using the telephone, MS teams or in-person on Shetland. Data collection was undertaken April to end of June 2025. In-person interviews were undertaken at local community care hubs (n=4) at regular events supported by Shetland Community Social Care 24th-28th June 2024. Interviews lasted between 20 and 75 minutes.

Interviews were professionally transcribed by an independent company and subsequently verified for accuracy against the original audio recordings by experienced researchers (MD and TG). To gain familiarity with the data, both researchers read the transcripts in full before undertaking systematic coding. Coding was conducted independently, after which the researchers compared and discussed their interpretations to enhance rigour and minimise bias. The agreed codes were then organised into preliminary themes, which were iteratively refined through collaborative discussion and the development of clear thematic definitions. Verbatim excerpts were selected to illustrate each theme, ensuring that the analysis was both transparent and firmly grounded in the participants' accounts.

3.4 Results

3.4.1 Participant characteristics

Ten participants (50% male) were interviewed. Age data were not explicitly collected; however, five participants disclosed their age during the interview, ranging from 45 to 83 years. Participants resided in Shetland (n = 4), Orkney (n = 1), small towns or villages in the Highlands (n = 4), and Inverness (n = 1). Three participants had been diagnosed with breast cancer, four with prostate cancer, and one each with lung, kidney, and throat cancer. All participants had completed their initial treatment, which included chemotherapy, radiotherapy, immunotherapy, and/or surgery, although some were still receiving maintenance treatment.

3.4.2 Barriers to participation

After analysis barriers to participation were grouped under 7 themes: lack of perceived need, access issues, timing issues, frustrations with the health system, group sessions, weather, and lack of contact/appointment. Each of these themes will be described and illustrated with quotes from the interviews.

3.4.2.1 Lack of perceived need

Lack of perceived need for prehabilitation refers to situations where individuals did not recognise the value or necessity of engaging in prehabilitation before treatment. The study findings suggest that this perception can arise for several reasons.

For some participants, a strong sense of existing social support meant they did not feel additional services were required. This was particularly evident in rural areas, where close-knit networks of friends and neighbours often provided informal help. As one participant explained, *"It depends on where it [prehabilitation] is, as well, because I live up here, and I've got a great community of friends and neighbours around me. Again, it depends on what it entails"* (Int 7, 196–197).

Others described a preference for maintaining their usual routines and "carrying on as normal," rather than seeking new forms of preparation. Prehabilitation was sometimes seen as something that might disrupt everyday life, rather than fit alongside it. One participant reflected: *"So pretty much in the period between the May and the July we carried on a normal family existence. We've got a croft, so I was home then, so I did everything that I could, I was feeling well, there was no issues around that and so yes pretty much it was keep myself busy and put it out of my mind as much as possible"* (Int 10, 154–158). Another added, *"I just carried on as normal, which here in where we live, we're very fortunate to have so much that we can do to keep ourselves fit and healthy"* (Int 1, 169–171). For some, the idea of prehabilitation was acceptable only if it did not interfere with ordinary routines: *"If it disrupted my normal life, then I probably wouldn't have [attended prehabilitation], no"* (Int 7, 154).

Finally, a lack of perceived need was sometimes linked to how participants understood their own health status. Several individuals did not view themselves as unwell enough to benefit from prehabilitation, despite their diagnosis. One participant explained, *"I suppose it would be the condition I'm in. If I was quite poorly, then yes, I would, probably [be interested]. But I wasn't poorly at all. Even though I had cancer, I wasn't feeling poorly, if you know what I mean?"* (Int 7, 209–211). Similarly, another reflected, *"The answer is yes I would take part in something like that [prehab programme] if I was feeling ill, if I needed it"* (Int 8, 208–229).

Together, these perspectives highlight how the decision to engage in prehabilitation is shaped not only by individual health perceptions, but also by the social and cultural context in which people live. Where strong community support, established routines, or a sense of being "well enough" are present, the perceived need for prehabilitation may be reduced.

3.4.2.2 Access issues

Access issues refer to the practical and personal barriers that made it difficult for individuals to take part in prehabilitation. Two main access barriers were identified across interviews: geographical and financial.

For those living in more rural areas, the distance to travel for in-person sessions was a key barrier. As one participant explained, *"I suppose what it is though, I would probably be more likely to use the [Maggie's] services more if I actually lived in Inverness"* (Int 4, 231–233). Travel costs and the effort required to reach a service were significant considerations, particularly for older participants or those without easy access to transport. One person commented, *"I would have to look at it very carefully and see what value there would be in it... going to Lerwick would be a problem, because we're old, and we can't go on buses, we have to drive... [the fitness suite] is expensive, you see"* (Int 9, 620–632). Another participant highlighted, *"I no longer drive a car, so someone has to take me. The ferry costs £12 to take a car... so those are hindrances as it were"* (Int 8, 193–203).

In contrast, one participant noted that local access could sometimes be a deterrent if it compromised privacy: knowing others in a small community could make it uncomfortable to attend a visible, health-related programme. As one participant stated; *"Because actually, when I think about it, the prehab little discussion group that they have, there was only one other person that was taking part in it. And do you know, it was sods law, actually, that I did know her" (*Int 4, 387-390). The wish for anonymity in smaller settings demonstrates that accessibility is not only about distance or cost, but also about personal comfort and perceived stigma.

3.4.2.3 Timing issues

Timing issues describe how the moment and manner in which information about prehabilitation was shared affected participants' ability or willingness to engage.

Many participants described the initial shock of receiving a cancer diagnosis as an overwhelming experience, leaving them unable to recall what was said at the time — including any mention of prehabilitation. One participant reflected: *"Well, I know I was definitely told to not work, but whatever else he [consultant] said during that appointment because it was my biopsy appointment where he actually told me I had cancer, it's really hard to remember what was said"* (Int 2, 269-271). Another highlighted: "*there was a bit of signposting in that sense, but, for me anyway, I was too freaked out to think logically*" (Int 2, 68-72). The emotional weight of the diagnosis made it difficult to take in detailed information or make decisions about new activities.

Participants also commented on the *volume* and *format* of information they received. Printed materials, such as long booklets or multiple leaflets, were sometimes overwhelming. One participant reflected, *“And I think the main booklet that they give you for lung cancer… it’s quite thick. And I think… yes, there was just so much in it. And I’m wondering whether that was the best thing to dish out at that particular point”* (Int 4, 273–276). Similarly, another participant noted that *"the information might have been down there, but when you are suddenly presented with several books...there were no conversations, and really left to my own devices, and basically just turning up at the doctors and , "Ah, we're going to give you this injection and put you on these tablets"* (int 9, 216-217, 222-223).

Others noted that much of the information was generic and could easily be found online: *“It’s all well and good that your oncologist sends you out information on all the chemo you’re going to be on, but it’s literally printed off the Macmillan website… there needs to be a little bit more specific”* (Int 3, 568–571).

Several participants emphasised that information was more meaningful when discussed face to face with a healthcare professional, allowing them to ask questions and check their understanding. For example, one participant highlighted that *“the handed information sheet tells you the worst-case scenario but it’s dehumanised, a piece of paper that [pause] Yes. I suppose the human interaction would have been, well definitely is the thing that I’ve missed in this process” (*int 10 417-420). Without this personal element, participants sometimes sought information elsewhere, which could heighten anxiety. One participant shared, *“So instead of getting myself engaged in prehab-type activities, I was off googling and getting private health appointments and going to the GP every day. I even ended up in A&E one night… thinking I was having a heart attack, but it was clearly an anxiety attack”* (Int 2, 46–50).

Overall, these findings suggest that both *when* and *how* information is provided plays a critical role in whether individuals can process it and act on it.

3.4.2.4 Frustrations with health system

Frustrations with the healthcare system emerged as another factor influencing engagement with prehabilitation. Participants described experiences of poor communication and a sense of disconnection between different services. These frustrations sometimes led to disengagement or reluctance to seek further support. One participant commented:

> *"I think what should have been done differently was that when they discharged me after one day in hospital – which I think was quite correct, I don’t think a stay in hospital would have helped – that there was no back up or support from the hospital or my doctor. There appears to be very*

> *poor link-up between the hospital and medical services, and XXX Health Centre is notoriously poor. I mean, I don't know if a doctor's been to [small island community] this year, but it will be a bit of a miracle if they have. They regard us as over the water and a bit of a nuisance, I think."* int 8 112-119

Some participants felt that the healthcare journey was fragmented, with unclear referral pathways or inconsistent follow-up. Others spoke about feeling lost within the system, where information was provided but not always coordinated or personally relevant (see also section above about written materials). Such experiences shaped overall trust in services and willingness to participate in additional programmes like prehabilitation. One participant highlighted the need to push for follow-up:

> *"So then two weeks came, so on the second week, there was no telephone call, there was no appointment to say, 'You've got an appointment for so-and-so.' So I was like, "No, I'm not having this,' so I contacted the nurse and I was just like 'I got my scan and they said two weeks,' and then she got back to me and she said 'oh, there's nothing in the book, there's nothing in the diary. I'll get [Doctor] to get an appointment sorted for you for the next week or two,' and I was like, 'No. You said two weeks. Two weeks is two weeks. It's two weeks now. I'm not waiting another two weeks for my results'. Because at that point, I didn't know if it was... you know, this was a staging MRI to see if it had spread to my nodes and stuff. I wanted to blinkin' know, because, for those two weeks. I was in that limbo of, like 'has it spread? Has it not spread?...But it was like, I had to be... there are a few things that I've had to be a little bit pushy with. Not pushy, but just be like, 'No, I need to know now. That's not good enough,' sort of thing."* Int 3, 150-165

> *"So I don't want to sound like I'm complaining, but I found it difficult that I was diagnosed by the consultant on the Friday and I didn't get to speak to the breast care nurse, who is the point of contact for all of your questions, you know, you loads of questions after you've sat and thought about it, until the Thursday. I thought that was quite a long week, like a week when you've got, you know, this chaotic mind and all of these things going on"* Int 2, 350-355

3.4.2.5 Group sessions

Group sessions were viewed by some participants as both helpful and challenging aspects of prehabilitation. While some valued the chance to share experiences, others found group-based settings emotionally difficult or off-putting.

For some, being surrounded by others at different stages of illness was distressing. One participant explained, *"I didn't go back [to Maggie's]... there were so many people there that* *were going through treatment, and I hadn't. I didn't want to break a circle or get to know some people who might not survive. I thought that might be quite difficult for me"* (Int 5, 494–503). Another said, *"I sat through a couple of hours of listening to people telling me how terrible the whole experience was… I've always been a pretty positive person… I didn't find that particularly helpful at all"* (Int 10, 172–181).

Where a person was in their cancer journey potentially influences their perceptions of group sessions. As one participant noted:

> *"Doing a group session is a difficult thing to organise, isn't it, because the odds are that the people most motivated to go will be the people with the story to tell. The people that go through treatment and have little negative experience, 'well what do I want to go for because I've got nothing to tell people'. And equally, I think the fact I went before everything really kicked off, I probably wasn't well suited to being shoehorned into a group that was hardened veterans having treatment or finishing treatment. And again I'm not criticising, I'm sure there are some people that can go to something like that and gain information from it, but again I would have preferred to have known nothing rather than to know bad things"* (Int 10 533-541).

Others described the emotional challenge of entering a group setting at all, with one participant noting, *"It was a bit daunting going to the entrance [of Maggie's]… you're suddenly accepting or admitting to yourself that you've actually got cancer, going in there"* (Int 4, 339–344).

While group settings can offer peer support, these reflections show that the format needs to be sensitive to individual preferences, emotional readiness, and the desire for privacy.

3.4.2.6 Weather

Weather and environmental factors were also mentioned as practical barriers. Participants living in rural or northern regions highlighted that poor weather conditions limited their ability to travel or participate in outdoor activities, especially during winter months. One participant noted, *"…obviously here in the winter… you can't really go out sort of after four or five o'clock when it's cold and wet and dark"* (Int 1, 300–302).

These realities underline the importance of considering local and seasonal conditions when designing accessible and sustainable prehabilitation programmes.

3.4.2.7 Lack of contact/appointment

Lack of contact or appointment refers to the absence of proactive outreach or direct communication from services. Several participants suggested that if they had been personally contacted or offered a scheduled appointment, they would have been more likely to engage. One participant reflected that this was particularly true for men, explaining that being less inclined to seek help independently meant that personal invitations or reminders could make a significant difference:

> *“Again, I took the masculine route, I suppose, of not getting to the stage of contacting the charity thing. I suppose, lazily, I maybe thought at some stage somebody would say, “Oh [Respondent], can we have a little chat about all of this?” It’s probably got a little bit of a grounding in the fact that we men are not very good at talking about things anyway, but if it was a formal appointment I would have undoubtably attended and availed myself of the service”* (int 10, 25-255).

This highlights the value of active follow-up and personalised communication to encourage participation, especially among individuals who may be more reserved or uncertain about initiating contact themselves.

3.4.3 Facilitators of participation

After analysis facilitators of participation were grouped under 6 themes: Positive initial engagement, perceived benefits, existing social support, potential for new social support, direct suggestions from HCP, and personal relevance. Each of these themes will be described and illustrated with quotes from the interviews.

3.4.3.1 Positive initial engagement

The sense that any early contact with prehabilitation services had been positive and beneficial was highlighted as important for further engagement. The benefits from these early contacts included being uplifting, normalising crazy thoughts, and knowing that the support was there. One participant highlighted how initial contact with Maggie's had calmed her down, reassured her and gave her a community:

> *"Basically, as soon as I even spoke with someone there [Maggie's], that level of panic drained away straight away. But it was one of those ones where as soon as I left the centre I was immediately back to, 'oh, my God, I'm gonna die,' basically. I mean, that's panic, isn't it? So I just went back the next day and the next day and the next day and the next day after that… for some reason, going there helped. I don’t know if it’s because you’re meeting a community and you’re basically joining a community of people who are in the same boat. And it gives you opportunities to talk to them about how you’re feeling, and knowing that actually, all these crazy thoughts that you’re having are actually not crazy and pretty much everyone else- " (int 2 111-115, 124-128).*

One participant did caution that encounters were not always uplifting and this may be off-putting: *"But Maggie's, it's a funny place. I can go there and have a really great time and be really uplifted and feel great, or I can come out feeling like I want to split my wrists. It can be quite depressing for obvious reasons"* (Int 3, 231-233). Another participant while referring to Maggie's Centre noted *"And you could see that people were in different stages of it, and obviously, their families were there, and I thought, 'No, that could be quite heavy for me'"* (Int 5, 360-361).

This theme highlights the importance of getting first exposures to prehabilitation ‘right’ and making sure that participants take something positive and personally relevant (see also 3.4.3.6) to themselves from it.

3.4.3.2 Perceived benefits

A key facilitator for participation was a belief that they would benefit from engaging with prehabilitation. This belief may rest on keeping an open mind that they might learn something as highlighted by one participant: *"There's always something that maybe you can get out of it, yeah. And even though probably I didn't get a huge amount in terms of fitness and diet and so on, I'd just get the information about the sensory and mental health, so yeah what motivated me was that I might learn something. I don't know it all"* (Int 1, 433-436). Along these lines another participant noted: *"It's hard because, you know, going to radiotherapy, you don't know what you don't know, you don't know what to ask about"* (Int 2, 394-396), suggesting that prehabilitation can help someone identify what they need to ask as they approach treatment.

An opportunity to address feelings of uncertainty and/or not knowing what to expect from their treatment motivated some to attend prehabilitation: *"Yeah, I mean, it did prepare me for... I mean nothing prepares you for walking into a chemo suite. Like, nothing. But it did prepare me for how I might feel after the treatment, you know, things you could do to help alleviate symptoms, things you could do to help yourself, like try and keep active if possible, rest when you need to, all of that sort of thing"* (Int 3, 340-344). Another participant noted: *"I went in and saw her [cancer nurse], and she showed me round the Macmillan Suite, and showed me where I would go for my chemo. And yes, I'd forgotten about that. Yes, that was huge, because I wasn't then just going in and I didn't know where it was or what to expect, yes"* (Int 4,165-169). For others prehabilitation gave them a sense of doing all that they could were gaining some control over the process: *"I suppose I was thinking, you don't want to think you're missing a step in the process. And so, I kind of thought, 'Oh, well that's good then, I've done that.' And then yes, I think I felt better more in control then, sort of thinking, 'Oh well, yes, I've done that [prehab course]. So yes, now I can move onto the actually treatment*" (Int 4, 316-320).

The opportunity to gain emotional or psychological support from prehabilitation activities encouraged some participants to engage with services. For some this support helped them find a way to tell their family about their diagnosis and for others it allowed them to feel that they were reducing the perceived burden on loved ones. One participant said: *"So it took me almost four weeks to tell my son after I was told because I knew that I needed to be calm to have that conversation with him, and I just thought I needed to get into that place, which is why I was back and forward to Maggie's every day. They helped with some of that as well, they gave me a book and spoke through some of the stuff. They actually offer for the kids to go in"* (Int 2, 135-140). Another participant noted how they wanted to be the strong one for their family: *"I just mean you just carry some of that yourself. Yes, and also, my family, my children have been so supportive. And I didn't want to alarm them about it [cancer]. I've always wanted to be the strong one for them"* (Int 4, 382-384). A participant elaborated on how having a neutral person to talk to would have helped them discuss the fears that they didn't want to burden their family with:

> *"I suppose I've tried to be open with my wife and my sons about the situation as much as I humanely can, but unconsciously at each stage I've undoubtedly tried to reduce the consequence, the potential consequence, and I think to a stranger you could genuinely sort of express the fear that was part of it, because I must admit it was a period when I was incredibly fearful of what the future held, so maybe having somebody just turn around and say, "It's okay to be scared," rather than just work it out for myself. I'm sure that's different for lots of people, but equally I would imagine it's quite a common thing for a lot of people as well to sort of want to be scared and to share it sort of thing"* (Int 10 203-211).

The opportunity to prepare physically for the treatment was an important perceived benefit and motivator for some participants. One participant noted how getting fitter would aid their recovery: *"...getting myself as fit as possible only because I knew that if I was then my recovery would be quicker"* (Int 1, 195-197). One participant who had not been offered any activities suggested that this would have been helpful and improved their outcomes:

> *"I think in relation to quicker recovery, being physically more prepared. I mean, I don't know whether by having that prehabilitation, whether that would have affected how my abdominal muscles sit now, whether they would have been better.... But it would have been that, that I would have been looking for. What kind of exercises could have been done, what would have been more beneficial to the recover, and even recovery post-operatively for the right side as well"* (Int 6, 223-233).

Different potential benefits were important to different people. Many of the benefits highlighted by participants wereof a psychological or emotional support nature and only a few discussed physical benefits. To maximise engagement it will be important to not only highlight all the potential benefits but to also identify those that are personally relevant to each individual.

3.4.3.3 Existing social support

Participants highlighted how knowing someone who knows what is available and when it is own helped raise awareness and encouraged participation. Additionally, if they knew someone who was able to 'take them along' the first time this reduced anxiety and made the process of engaging with support services less daunting. Participants also talked about how it can be difficult to 'cross the threshold' and having direct support to do this got them to actually go and enabled someone else to introduce them. While there was a physical threshold to cross there was also a mental threshold of accepting you have cancer. These sentiments are best summed up in the following quote from a participant:

> *"I've got two good friends in the village...They'd known about my lump, they were involved from the very beginning. So they arranged to take me to Maggie's and introduced me to the staff there...I mean, I don't know if I'd have gone on my own, because that would have been like, 'Oh hi, I'm [name] and I've got cancer.' Like cringe. At least I had two people who'd been there and who were familiar with the place and the staff were familiar, to take me in and say, 'this is our friend, [name]. Unfortunately, she's been diagnosed with...' and they did that bit for me. I can imagine if you were going in on your own it would be quite daunting."* (Int 3, 196-200,584-589)

Another participant noted how difficult that first step could be when they talked about going into Maggies for the first time: *"And then just as I was coming back [to the hospital], I thought 'Oh, do you know what, I think I'll go and pop into Maggie's Centre.' And that, to me, that was huge. Walking across that threshold, because it was almost like that was me accepting that I'd got cancer. And I felt quite nervous, and I actually felt quite emotional when I went in the door"* (Int 4, 80-84). They went to explain later in the interview that this may have been easier if they had someone with them: *"If you've got a partner with you or your friend or whatever, it's maybe sometimes easier doing these things. Because it was a bit daunting, actually, ,going to the entrance [of Maggie's], and you sort of think, ' Oh, should I be going in here?'...you're suddenly accepting or admitting to yourself that you've actually got cancer, going in there"* (Int 4, 339-344).

Some participants raised cautions around the language that friends or family may use, highlighting how this can be either off-putting or uplifting: *"she [friend] was giving it to me like doom-meister. Sometimes I was like 'Oh, no, please don't tell me anymore. I don't want to know' (Laughter)"* (Int 3, 274-278), but about another friend she said: *"We're on the same wavelength. So, she [friend] would never say anything* *to scare me, she was never like, ;Oh, you're gonna feel like this, you're gonna feel like that,' it would be much more, you know 'Yeah, you might feel a bit…' (*Int 3, 293-295).

3.4.3.4 Potential for new social support

For some the opportunity of joining a community of people having similar experiences was motivating. Note though, as previously mentioned (see 3.4.2.5) joining a group was barrier to some people.

While they admitted it was a group that no-one wanted to join, it provided an opportunity to benefit from the shared experience or to benefit from those with more experience. These new social support systems could lead to long-term relationships that sat outside the formal group sessions. *"It is like being part of a gang that nobody wants to be part of but here you are and you've just got to make the best of a really crappy situation. I went to a group at Maggie's called 'the memory group', memory and cognitive group, and there were four of us… But we keep in touch, we meet up once a month and have coffee together. There's been a good thing. All different cancers, but all having the same experience really at the end of the day." Int 3, 440-446*

> *"Do you know what I liked? This is one of the things that I've said before is I liked meeting people that I would never have had the opportunity to meet and have a friendship with. So I like the community feel of it if that makes sense." Int 2, 174-176*

3.4.3.5 Direct suggestions from HCP

This theme relates to participants indicating that a direct suggestion from a health care professional to do something encouraged them to take the first step. This theme is the counterpoint to 3.4.2.7 Lack of contact/appointment. One participant noted: *"It wasn't until probably about a week to 10 days of that torturous rollercoaster that I put myself on, it was the junior doctor who saw me in A&E that night that said 'Oh, you really need to get yourself to Maggie's'. I went to Maggie's and did some of the, you know, because, apart from their group sessions, they've also got group sessions on getting prepared. It's almost like the mental aspect of it"* (Int 2, 52-56). Another noted how being made aware specifically of when a prehabilitation session was available that they signed up for it: *"…that's what motivated me to go to prehabilitation, because the person I was speaking to said it was available, and she said, 'Oh, we've got one running a few days' time,' so I said, 'oh yes, put me down for that, I'll do it"* (Int 4, 344-346).

Using posters and leaflets around clinics may also help raise awareness of opportunities and either stimulate a conversation with a HCP or motivate someone directly to go. This is captured in this quote from a participant: *"I mean, in the breast clinic they could maybe have more stuff about Maggie's on the wall or they could maybe give you a leaflet to be, like, 'Ooh…' Maybe when they're giving you that little* *chat, they could say, 'There's Maggie's over there.' You know, just point you in that direction."* Int 3, 595-598.

Continued encouragement and support from healthcare professionals to attend prehabilitation may be important to facilitate participation.

3.4.3.6 Personal relevance

This theme captured the sense that participants wanted information and services that were relevant to their personal situation. They wanted information that was tailored to their own situation. This theme links to 3.4.2.3 Timing Issues, and specifically to the comments about the generic nature of information given in written form and the lack of personalising of this. Participants did appreciate it when services accommodated their preferences for one-on-one input. As one participant described: *"Yeah, about the radiotherapy, and they accommodated a one-on-one version of it so that it wasn't in a group setting, which was quite good, and at a time that suited me for some stuff that I had going on in my personal life. So they were quite good about that"* (Int 2, 183-185)

3.5 Summary

The interviews identified a complex set of personal, practical, and systemic factors influencing participation in prehabilitation among people living with cancer. Seven key barriers and six facilitators were identified. Together, they highlight that engagement is shaped not only by individual motivation or understanding but by how services are designed, communicated, and connected to people’s lives. The findings have implications for service design, workforce development, and investment priorities to ensure prehabilitation reaches those who could most benefit.

3.5.1 Barriers to Participation

Perceived Need and Awareness

A lack of perceived need was one of the strongest barriers. Many participants did not view prehabilitation as relevant to them, particularly if they felt well, had strong community networks, or preferred to maintain their usual routines. This underscores the importance of early, clear communication about what prehabilitation is, who it is for, and how it complements rather than disrupts everyday life. Without this framing, potential participants may not see its value until their health deteriorates.

Access and Geography

Geographical isolation, travel costs, and limited transport were consistent barriers, particularly in rural and island communities. Conversely, in small communities, a lack of privacy could also deter engagement. This demonstrates the need for flexible, locally adapted delivery models — including virtual and outreach approaches — that reduce logistical and psychological barriers alike.

Timing and Information Overload

Participants described being overwhelmed at diagnosis, unable to absorb information about prehabilitation. Written materials were often too dense or generic, while personal contact was lacking. This finding suggests that the *timing* and *format* of communication are as important as the message itself. Information needs to be simple, staged, and reinforced through human interaction.

Systemic and Communication Gaps

Frustrations with fragmented health systems, inconsistent follow-up, and poor coordination between hospital and community services discouraged engagement. Participants who "fell between the cracks" often lost trust and motivation to seek additional support. This indicates a clear need for integrated referral pathways, active follow-up, and a defined point of contact for prehabilitation across the cancer journey.

Group Dynamics and Emotional Readiness

While group sessions can be supportive for some, others found them distressing or intimidating, particularly when confronting visible illness or mortality. Offering choice — between group and individual formats — is therefore essential for equity of access and emotional safety.

Environmental and Seasonal Factors

In rural regions, poor weather and limited daylight restricted travel and outdoor activity, highlighting the need for flexible scheduling and remote options.

Lack of Proactive Contact

Many participants said they would have attended if they had received a personal invitation or formal appointment. Passive signposting was insufficient. This finding points to the value of active outreach — a low-cost, high-impact intervention.

3.5.2 Facilitators of Participation

Positive Initial Engagement

When first contact with prehabilitation services was positive, participants described feeling calmer, reassured, and more connected. This early experience was pivotal in determining whether they returned. Services therefore need to prioritise *first impressions* — ensuring that initial encounters are welcoming, emotionally supportive, and clearly linked to personal benefit.

Perceived Benefits

Believing that prehabilitation could improve physical recovery, emotional wellbeing, or confidence strongly motivated participation. Importantly, participants valued the sense of *doing something* to help themselves. Communication strategies should therefore highlight tangible, holistic benefits — physical, psychological, and practical — in ways that align with patients' individual concerns.

Existing and New Social Support

Both existing friendships and opportunities for new peer connections facilitated engagement. Being "taken along" by a friend or introduced by someone familiar reduced anxiety and normalised attendance. Structured peer ambassador or buddy schemes could build on this natural facilitator.

Health Professional Encouragement

Direct, personalised recommendations from healthcare professionals were powerful motivators. Participants may only act when a trusted professional suggests or arranges it. Embedding prehabilitation referrals into standard clinical pathways, supported by prompts and clear eligibility criteria, could significantly increase uptake.

Personal Relevance and Flexibility

Tailoring content, timing, and delivery format to individual circumstances increased engagement. One-on-one options and scheduling flexibility were particularly valued. This personalisation reinforces that prehabilitation is most effective when it feels "for me" rather than "for everyone."

3.6 Conclusion

Overall, this interview study demonstrates that participation in prehabilitation is not limited by willingness, but by accessibility, timing, and design. People want to take part when services feel personally relevant, well-timed, and easy to access. Addressing these barriers and amplifying the identified facilitators will require coordinated investment across communication, workforce, and service delivery infrastructure. Such investment will not only improve prehabilitation uptake but also enhance patient confidence, reduce treatment complications, and support more equitable cancer outcomes across Scotland.

4.0 Recommendations

The following recommendations are drawn from both the rapid review and qualitative interviews exploring barriers and facilitators to prehabilitation participation among cancer patients.

Priority area	Recommendation	Intended Impact
Improve Communication and Awareness	Develop clear, concise information about what prehabilitation involves, its benefits, and how it fits into the treatment pathway. Reinforce messages at multiple points with verbal and written materials	Increases understanding, motivation, and early engagement.
Embed Proactive and Equitable Referral Pathways	Move from passive signposting to active invitation or 'opt-out' referral models. Ensure every eligible patient is offered prehabilitation as standard.	Expands reach and reduces inequity in access
Personalise and Tailor Delivery	Offer flexible options — including home-based, virtual, and community-based formats — with tailored goals and intensity. Provide opportunities to tailor generic information.	Improves accessibility and accommodates individual circumstances.
Strengthen Healthcare Professional Capacity	Provide training, time, and resources for staff to discuss, refer, and support patients through prehabilitation. Encourage consistent messaging across disciplines.	Enhances professional endorsement and continuity of care.

Integrate Social and Peer Support	Incorporate peer mentoring, buddy systems, or group options (where appropriate) to foster motivation. Have options for those not wanting group environment.	Builds confidence and sustained participation.
Monitor and Evaluate Engagement	Implement simple tracking systems to monitor uptake, identify barriers in real time, and inform continuous service improvement.	Ensures accountability and supports data-driven investment.

References

1. Bloom E. Prehabilitation evidence and insight review. https://www.macmillan.org.uk/_images/prehabilitation-evidence-and-insight-review_tcm9-335025.pdf accessed 1st August 2025: Macmillan Cancer Support2017.
2. Stewart H, Stanley S, Zhang X, Ashmore L, Gaffney C, Rycroft-Malone J, et al. The inequalities and challenges of prehabilitation before cancer surgery: a narrative review. Anaesthesia. 2025 Feb;80 Suppl 2(Suppl 2):75-84.
3. Macmillan Cancer Support. Principles and guidance for prehabilitation within the management and support of people with cancer. https://www.macmillan.org.uk/healthcare-professionals/news-and-resources/guides/principles-and-guidance-for-prehabilitation accessed 1st August 2025: Macmillan Cancer Support2020.
4. Michael CM, Lehrer EJ, Schmitz KH, Zaorsky NG. Prehabilitation exercise therapy for cancer: A systematic review and meta-analysis. Cancer Med. 2021 Jul;10(13):4195-205.
5. Singh B, Spence RR, Steele ML, Sandler CX, Peake JM, Hayes SC. A Systematic Review and Meta-Analysis of the Safety, Feasibility, and Effect of Exercise in Women With Stage II+ Breast Cancer. Arch Phys Med Rehabil. 2018 Dec;99(12):2621-36.
6. Toohey K, Hunter M, Paterson C, Turner M, Singh B. Clinical updates on the effects of high intensity interval training (HIIT) exercise in people diagnosed with cancer. A systematic review and meta-analysis. J Sci Med Sport. 2023 Oct 5.
7. Scottish Government. Socioeconomic inequality and barriers to primary care in Scotland: A literature review. https://www.gov.scot/publications/socioeconomic-inequality-barriers-primary-care-scotland-literature-review/pages/2/ accessed 1st August 2025: Population Health Directorate2025.
8. Macaskill D. A nation of two halves: forgetting rural Scotland. https://scottishcare.org/a-nation-of-two-halves-forgetting-rural-scotland/ accessed 1st August 2025: Scottish Care; 2024.
9. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ (Clinical research ed). 2021 Mar 29;372:n71.
10. Checkland K, Harrison S, Marshall M. Is the metaphor of 'barriers to change' useful in understanding implementation? Evidence from general medical practice. Journal of health services research & policy. 2007 Apr;12(2):95-100.
11. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. Systematic Reviews. 2016 2016/12/05;5(1):210.
12. Agasi-Idenburg CS, Zuilen MK, Westerman MJ, Punt CJA, Aaronson NK, Stuiver MM. "I am busy surviving" - Views about physical exercise in older adults scheduled for colorectal cancer surgery. J Geriatr Oncol. 2020 Apr;11(3):444-50.
13. Banerjee S, Semper K, Skarparis K, Naisby J, Lewis L, Cucato G, et al. Patient perspectives of vigorous intensity aerobic interval exercise prehabilitation prior to radical cystectomy: a qualitative focus group study. Disabil Rehabil. 2021 Apr;43(8):1084-91.
14. Barnes K, Hladkowicz E, Dorrance K, Bryson GL, Forster AJ, Gagné S, et al. Barriers and facilitators to participation in exercise prehabilitation before cancer surgery for older adults with frailty: a qualitative study. BMC Geriatr. 2023 Jun 6;23(1):356.
15. Beck A, Thaysen HV, Soegaard CH, Blaakaer J, Seibaek L. Investigating the experiences, thoughts, and feelings underlying and influencing prehabilitation among cancer patients: a qualitative perspective on the what, when, where, who, and why. Disabil Rehabil. 2022 Jan;44(2):202-9.

16. Cooper M, Chmelo J, Sinclair RCF, Charman S, Hallsworth K, Welford J, et al. Exploring factors influencing uptake and adherence to a home-based prehabilitation physical activity and exercise intervention for patients undergoing chemotherapy before major surgery (ChemoFit): a qualitative study. BMJ Open. 2022 Sep 22;12(9):e062526.
17. Karlsson E, Dahl O, Rydwik E, Nygren-Bonnier M, Bergenmar M. Older patients' attitudes towards, and perceptions of, preoperative physical activity and exercise prior to colorectal cancer surgery-a gap between awareness and action. Support Care Cancer. 2020 Aug;28(8):3945-53.
18. Paulo CM, Ali AA, Schmeusser BN, Midenberg E, Helman TA, Diller ML, et al. Barriers and facilitators to physical activity prehabilitation in patients with kidney cancer. Eur J Oncol Nurs. 2023 Aug;65:102333.
19. Powell R, Davies A, Rowlinson-Groves K, French DP, Moore J, Merchant Z. Acceptability of prehabilitation for cancer surgery: a multi-perspective qualitative investigation of patient and 'clinician' experiences. BMC Cancer. 2023 2023/08/11;23(1):744.
20. Powell R, Davies A, Rowlinson-Groves K, French DP, Moore J, Merchant Z. Impact of a prehabilitation and recovery programme on emotional well-being in individuals undergoing cancer surgery: a multi-perspective qualitative study. BMC Cancer. 2023 Dec 14;23(1):1232.
21. Purdy GM, Nanad R, Ternes L, Dolgoy ND, Sellar CM, Francis G, et al. Exercise Preferences, Barriers, and Facilitators of Individuals With Cancer Undergoing Chemotherapy Before Stem Cell Transplantation: A Mixed-Methods Study. Cancer Nurs. 2024 Sep-Oct 01;47(5):E287-e97.
22. Smyth E, Brennan L, Enright R, Sekhon M, Dickson J, Hussey J, et al. The acceptability of exercise prehabilitation before cancer surgery among patients, family members and health professionals: a mixed methods evaluation. Support Care Cancer. 2024 May 31;32(6):399.
23. Voorn MJJ, Bastiaansen EMW, Schröder CD, van Kampen-van den Boogaart VEM, Bootsma GP, Bongers BC, et al. A qualitative stakeholder analysis of beliefs, facilitators, and barriers for a feasible prehabilitation program before lung cancer surgery. J Cancer Res Clin Oncol. 2023 Nov;149(17):15713-26.
24. Beck A, Vind Thaysen H, Hasselholt Soegaard C, Blaakaer J, Seibaek L. What matters to you? An investigation of patients' perspectives on and acceptability of prehabilitation in major cancer surgery. Eur J Cancer Care (Engl). 2021 Nov;30(6):e13475.

Appendix A: Interview Schedule

Topic area	Prompt
• What did you do while waiting for treatment/surgery?	• How did you experience the period between diagnosis and the start of your treatment or surgery? •
• How did you feeling during that time? Please tell me about your thoughts and feelings.	• Did you have any symptoms while waiting for treatment/surgery?
• Did you do anything specifically to prepare yourself for treatment/surgery?	Formal prehab (see additional questions below) Exercise Diet Lifestyle Leaflet Mental health and wellbeing (eg stress) Did your clinical team advise you to be physically active/perform physical exercise training, adjust your diet, and/or stop smoking in preparation of your treatment/surgery?
• What did you find helpful to do while waiting for treatment/surgery?	
• What did you find unhelpful to do while waiting for treatment/surgery?	
• Did you have any contact with HCP to support you?	If so, describe – what, type, frequency, mode,
• Do you in retrospect wish that you had done anything different while waiting for treatment/surgery?	

Follow-up questions for those involved in any prehab:	
What was in your prehab programme? • What did you think about the x component? • What did you like/dislike about it? • Were there any problems or difficulties in taking part in x?	For each component (eg exercise, diet etc) as the other questions
• How effective did you feel the prehab was in preparing you for treatment/surgery?	
• What motivated you to take part in the prehab?	

For those who didn’t do prehab:	
• Have you heard of prehabilitation?	• What are your thoughts about such a program?
• What would stop you taking part in a prehabilitation programme?	
• What would motivate you to take part in a prehabilitation programme?	