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ORIGINAL ARTICLE



Insights and recommendations into service model structure, staff roles and qualifications in a UK cancer specific clinical exercise service: a multi-method qualitative study

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ABSTRACT

Purpose: Clinical exercise delivery in the United Kingdom is disparate in terms of service structure, staff roles and qualifications, therefore it is difficult to evaluate and compare across services. Our aim was to explore, in a purposely selected cancer exercise service that was recognised as effective; (i) how staff knowledge, skills and competencies contribute to the provision of the service, (ii) how these components assist in creating effective services, and (iii) to identify existing challenges from staff and service user perspectives.

Methods: The Consolidated Framework for Implementation Research was used as an overarching guide to review the Prehab4Cancer service. Exercise specialists and service user perspectives were explored using a multi-method approach (online semi-structured interviews, online focus group and in-person observation) and data triangulation.

Results: Exercise specialists were educated to a minimum of undergraduate degree level with extensive cancer-specific knowledge and skills, equivalent to that of a Registration Council for Exercise Physiologist (RCCP) Clinical Exercise Physiologist. Workplace experience was essential for exercise specialist development in behaviour change and communications skills.

Conclusions: Staff should be educated to a level comparable with the standards for registered RCCP Clinical Exercise Physiologists, which includes workplace experience to develop knowledge, skills and competencies in real-world settings.

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KEYWORDS

Exercise knowledge; skills and competencies; cancer exercise provision

> IMPLICATIONS FOR REHABILITATION

Cancer services

- Clinical exercise staff should attain extensive cancer-specific knowledge, skills and competencies, underpinned by undergraduate degrees in sport and exercise science-related subjects or higher and equivalent to that of Registration Council for Exercise Physiologist -registered Clinical Exercise
- Workplace experience is vital for exercise specialists to develop their knowledge, skills and competencies in real-world settings.
- Behaviour change and communication skills, specifically empathy and listening skills, should be incorporated into clinical exercise practitioner training.


Introduction

In the UK, in 2019, 38% of the UK adult population had a long-term chronic and complex medical condition, translating into one of the largest financial burdens within public healthcare [1–3]. The NHS long-term plan advocates exercise within clinical care services, however, there are few recommendations regarding service structures for this to occur, or the staff requirements including qualifications or regulation [1]. For the NHS to achieve its priority of providing standardised, effective and cost-efficient exercise services for long-term conditions, a system-wide understanding of what is currently being offered, to whom, and by whom, is required [4,5]. Recently, we audited exercise provision within UK

clinical exercise services focusing on exercise staff job titles, roles and qualifications across cardiovascular, respiratory, stroke, falls and cancer services. We reported service provision was inconsistent, piecemeal and unstandardised, within and across most of these conditions. Moreover, a large part of the exercise provision was delivered by an unregulated workforce [4,5].

Given the current disparate structures in service models, staff roles and qualifications, it is difficult to evaluate and compare within and across services [5]. Thus in the current study we examined one clinical exercise service. The service was cancer-specific wellness programme located in Greater Manchester, in the North-West of England. It is important to highlight, in the audit by Crozier et al. [5] cancer exercise service provision were less defined in terms of

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structure, and were frequently delivered by an inconsistent range of individuals with a diverse set of qualifications and skills ranging from vocational exercise qualifications to master degrees in sport and exercise science-related subjects. The service, purposely selected because it was (i) well established (one of the largest to operate in the UK), (ii) recognised nationally for good practice (highlighted by MacMillan and received the Health Service Journal NHS partnership award), and (iii) delivered by exercise health professionals alongside a Multi-Disciplinary Team (MDT) *via* a novel delivery method (in the community in collaboration with leisure services). A number of hospital trusts are developing and attempting to commission cancer-specific exercise services and insight into a cancer-specific clinical exercise service are pertinent [6,7].

In this case study a multi-method approach with data triangulation was employed to identify (i) how staff knowledge, skills and competencies contribute to the provision of an effective clinical exercise service, (ii) how these components assist in creating effective service teams, and (iii) to identify existing challenges from staff and service user perspectives.

Method

Design and theoretical underpinning

A case study format employed ethnographic principles (including the exploration of peoples' cultures and habits) to uncover beliefs, values and attitudes retained by the participants. Multiple qualitative methods (online semi-structured interviews, online focus groups, online and face-to-face observation of exercise delivery and field notes) were employed to explore the service from staff and service user perspectives both individually and collectively. This qualitative multi-method approach, combined with the longevity of the study and data triangulation, assisted in reducing potential social desirability and bias from staff and service user perspectives due to an increased openness and honesty in conversations with the researcher, generated by rapport development [8]. Ethical approval was obtained from local research ethics committee [ref: 21/EM/0227]. The lead researcher spent 2–3 days per week for 12 weeks in the service between January–March 2022. The researcher concentrated on field notes and observation (both online and in-person) for the first six weeks *via* attending exercise classes. This increased both staff and service user familiarity with the research team before any semi-structured interviews were completed [8].

Consolidated framework for implementation research (CFIR)

A comprehensive implementation framework (CFIR) was adopted [9]. Originally designed for use in implementation studies, CFIR

combines existing theories to create a list of ideas which assist in future service implementation and evaluation [9]. CFIR focuses on what works, where, and why (e.g., [10]). Specific components relating to service delivery including staffing structures, staff skills and competencies, and service user perceptions allow a detailed exploration of these areas through contextual discussions regarding service operations [9,11]. All five sections of CFIR were drawn upon throughout this study (see Table 1) and provide a framework for interview guide (additional file 1).

Prehab4Cancer and recovery programme

The Prehab4Cancer (P4C) service began in April 2019 in collaboration with system-wide stakeholders including a leisure trust consortium and the NHS cancer alliance. The original programme objective was to provide two thousand service users face-to-face community-based pre/rehabilitation using affiliated leisure facilities ($n=99$) across the Greater Manchester region (urban location in the North-West of England with higher than national average levels of deprivation). Service users are supported before (prehabilitation) and after (rehabilitation) cancer treatments (either surgical or non-surgical), and where applicable during treatment, to have increased physical, nutritional and psychological support. Full details of the intervention are provided in Table 2 [15].

Participant recruitment

Staff participant recruitment was based on convenience sampling with all exercise specialists indicating a willingness to participate. An initial (virtual) meeting was conducted with all exercise staff ($n=8$) explaining the study aims, after which written consent was obtained. The final sample ($n=7$) included a range of staff members; a service manager ($n=1$) who oversaw the intervention, P4C exercise specialists ($n=4$) (one of which was a deputy service manager). All of these staff held undergraduate degrees and specialist cancer-related qualifications and delivered the exercise sessions. In addition, there were P4C exercise instructors ($n=2$) with exercise referral (fitness industry qualification) who supported session delivery. All staff members were white British, female ($n=5$) and male ($n=2$), aged between 22–52 years (mean age of 30 years), and employed full-time by the consortium of leisure trusts with a minimum of two years' experience in the role.

Service user recruitment was conducted *via* a verbal announcement at the start of all small group exercise classes ($n=30$), asking if attendees (some of which attended multiple classes) across these sessions ($n=50$) wanted to participate. All service users attending the sessions verbally consented to observational data

Table 1. Consolidated Framework for implementation research domains and constructs applied across each research study [12].

CFIR Domain	CFIR construct to consider	Overarching context within the case study
Intervention development & challenges	Intervention design & evidence	Interventions have 'core components' (the essential and indispensable elements of the intervention such as the exercise delivery) and an 'adaptable periphery' (adaptable elements such as exercise locations). This domain focused on how the service was designed and operated.
Service users and resources	Economic climate and Patient needs	Changes within the outer setting, such as service funding can impact how the service will proceed with its offering. This domain focused on the barriers faced by service users and what resources were available to support them.
Organisation & structures	Service characteristics	This domain focuses on how the structure of the service (staffing, age, size, qualifications) impacted the implementation of the intervention.
Staff skills & perspectives	Staff Knowledge, skills, competencies and beliefs	This domain focused on the individuals within the services (primarily exercise specialists) and how their cultural, organizational, professional, and individual mindsets and beliefs impacted service provision.
Service process and effectiveness	Staff beliefs regarding effectiveness	This domain focused on service effectiveness (or not) and the key indicators of it from staff perspectives.

Table 2. Intervention components mapped onto items 1 to 9 of the TiDieR checklist [13].

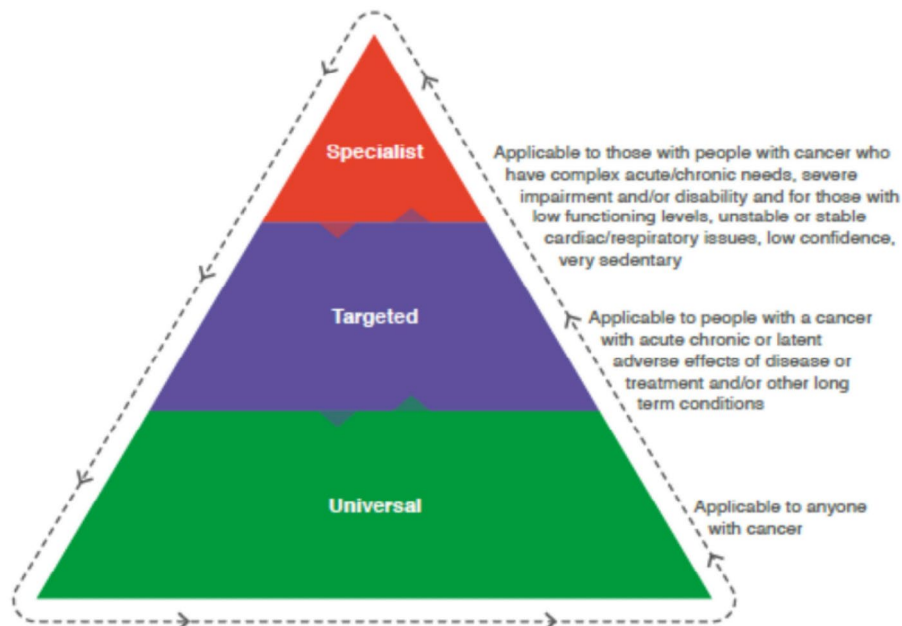
Item Number	Item
Brief Name	
1	Prehabilitation for cancer (P4C) recovery programme
Why?	
2	<p>Prehab for cancer patients undergoing surgery in Greater Manchester in the North-West of England become part of the Enhanced Recovery After Surgery+ (ERAS+) pathway. This was designed and developed to reduce complications (primarily pulmonary) after major surgery. The original implementation of ERAS+ at Manchester Royal Infirmary, demonstrated a 50% reduction in respiratory complications in patients undergoing major surgery and reduced hospital length of stay by 3 days (Moore et al. [7]). Such innovation has led to the integration of prehab into the ERAS pathway. The starting point for the surgical P4C pathway is the Multi-disciplinary team decision to operate based on the pathway below. In phase 1, all patients undergoing colorectal, lung and upper GI cancer surgery are offered 'Prehab4Cancer' without restriction.</p> <p>A 4 x assessments are carried out:</p> <ul style="list-style-type: none"> • On initial referral • Pre-op (end of prehab phase) • Post-op • Completion of rehab phase <p>Patient outcomes</p> <ul style="list-style-type: none"> • Length of stay • Patient morbidity • 2 year survival <p>Patient generated</p> <ul style="list-style-type: none"> • PROMs • PREMs

What?
3

Intervention resources

Consultation paperwork and assessments – see procedures and key components (5) below. Equipment available was leisure centre gym-based machinery such as cardiovascular and resistance machines, in addition to free weights and resistance bands. Assessments were carried out using blood pressure monitors, oxygen saturation monitors, weight and height scales, a hand grip machine and shuttle walk cones.

Once paperwork and assessments were completed, a brief conversation about service user goals and service provision was undertaken where possible with the instructor. Service users were then triaged into the pathway of support that best suited their condition and level of need:



(Continued)

Table 2. Continued.

Item Number	Item
4	<p>Procedures and key components Participants' wellbeing modality was constructed using the National Institute for Health and Care Excellence stepped care model approach to psychological support, highlighted in the Macmillan Prehabilitation Evidence and Insight report from 2017 [14] and accepted as an effective framework to deliver mental wellbeing assessment and intervention. Practical application: How this works practically is summarised in the diagram below:</p> <p style="text-align: center;">The Prehab4Cancer Pathway</p> <p>PREHABILITATION</p> <p>Questionnaires:</p> <ul style="list-style-type: none"> • EQ5D-L • IPAQ • Self Efficacy of Exercise • Rockwood Frailty • WHODAS 2.0 • EORTCQLQ-C30 • PGS-GA • IDDSI <p>Physiological testing:</p> <ul style="list-style-type: none"> • 6 Minute Walk Test • Incremental shuttle Walk • Hand Grip • Sit to Stand • CPET (if necessary) <p>REHABILITATION</p> <p>Health checks:</p> <p><i>At rest and exercising</i></p> <ul style="list-style-type: none"> • Blood Pressure • Heart rate • SP02 • Height • Weight • Medical history <p>Eligibility: Anyone with a cancer diagnosis on a curative pathway of treatment.</p> <p>Who will provide? 5. There are 12 community leisure organisations in the region that collaborate with the local cancer alliance and stakeholders to deliver the intervention. Various referral pathways were used: Referring health professionals: Referrals were accepted from all health professionals (GP's, physiotherapists, clinical nurse specialists). Specialist Exercise instructors: Based in regions, these instructors delivered face-to-face and virtual sessions to service users. P4C specialist exercise instructors (including the service manager/deputy manager) were qualified in cancer-specific exercise via vocational qualifications identified by the Chartered Institute for Management of Sport and Physical Activity (CIMSPA). They also retained multiple different specialist vocational qualifications in areas such as cardiac, falls, and stroke rehabilitation. Additionally, these instructors had undergraduate degrees in a Sport and Exercise Science-related subject. There were six staff in total at this level, all retaining responsibility for the whole patient journey. Exercise instructors (2) were qualified in exercise referral, they did not have any higher level vocational qualifications or undergraduate degrees. Their role was to support the specialist exercise instructors in service delivery. Programme manager and deputy manager: Ensured all staff had relevant resources to fulfil service requirements, including equipment and training. Assisted in delivering assessment clinics and exercise prescription sessions.</p> <p>How? 6. Instructor-led: Face-to-face and one-to-one format of delivery to individuals. This then expanded into small group exercise sessions (due to COVID-19) consisting of 8-15 service users via the Microsoft teams platform (virtual).</p> <p>Where? 7. All service user consultations and activities took place virtually via Microsoft teams or face-to-face at a local leisure centre.</p> <p>When and how much? 8. The intervention had an initial 3-4 week prehabilitation phase (where applicable) and a 12-week funded period of rehabilitation. The programme was not restricted in terms of days or times service users could use facilities. Service users were able to access the gym, swimming and fitness classes throughout the region as part of the intervention. Once 12-weeks had been completed service users had the option of continuing to attend the facilities at a subsidised rate of membership. The virtual classes, however, were free of charge and had no access restrictions, i.e., it surpassed 12 weeks due to lack of cost associated with virtual delivery.</p> <p>Tailoring 9. All sessions were tailored to individual goals and used individualised exercise prescription developed by specialist exercise professionals.</p>

collection by the lead researcher. Attendees interested in taking part in the focus groups were provided with a written study information sheet and consent form, and a day/time was arranged for focus group. No one formally declined or stated any reasons for not taking part in the focus group, but often participants cited time restrictions so did not participate. The service user focus group ($n=9$) were white British ($n=8$) and Asian ($n=1$), male ($n=6$), retired (mean age of 67 years), had various long-term

medical conditions, and were specifically referred due to having one of the three cancer pathologies accepted via the service inclusion criteria (i.e., colorectal, lung or upper gastrointestinal). Few participants had a relationship with each other or the exercise specialists before attending the intervention. The researcher involvement was limited to participant recruitment and data collection and had no prior relationship with the intervention or participants.

Data collection

Staff participants worked across different sites based on individual caseloads allowing observational and semi-structured interview data collection. The eclectic and multi-faceted nature of the service provision meant that service users were unpredictable in their attendance which made it difficult to just use one singular method to obtain a sufficient cross-section of participant feedback. A focus group [16], in combination with observational data were used to understand the experiences of service user participants who attended different sessions within the intervention, encouraged peer interaction and the promoted shared experience where possible (e.g., [14]).

Semi-structured interviews

The semi-structured interview guide (see [additional file 1](#)) was developed based on the CFIR framework. The lead researcher had previous experience conducting semi-structured interviews, therefore focused on open questions allowing participants to respond with the issues they deemed most important [17]. Pilot interviews were conducted by the first author with three independent researcher peers prior to study commencement to enhance credibility and refine interview questions where necessary [18]. Exercise specialist interviews ($n=7$) were conducted on an individual basis by the first author *via* a secure virtual platform (Microsoft Teams) lasting 51 min on average (range 22–76 min). Written consent was obtained before the interviews were visually and audio recorded with prompts and probes used to elicit more detailed responses [12]. At the end of each interview, a brief verbal summary was provided by the researcher to clarify the main points and allow individuals to add further information (where required) [19].

Focus group

One focus group was conducted by the first author with service users ($n=9$) who had been taking part in the exercise service for (at least) six weeks, *via* a secure virtual platform (Microsoft Teams). The visual and audio recorded focus group lasted 23 min and used the same CFIR-based interview guide as the semi-structured interviews. Spontaneous conversation was encouraged by the researcher with participants discussing and challenging opinions if they wished [20]. Clarification of information was sought during the questioning process to ensure participants were able to expand on each-other's opinion and summarise the information provided [20,21].

Observation and field notes

Observations of the setting, daily practice, staff and service user interactions were undertaken [13]. The lead author was typically on-site observing face-to-face interaction 1–2 days per week and engaged in virtual sessions ranging between 1–2 h per day for 2–3 days a week. The initial expectation to be fully immersed within the environment resulting in a more typical ethnographic position of hanging out and observing events as they unfolded [22] was limited due to service alterations resulting from COVID-19. In terms of procedure, notable moments were written down in a note pad in the form of keyword entries for both face-to-face and virtual observations [8]. Memories and reminders in the field notes then allowed the observations and conversations to be developed

into a research log, typically completed during lunch breaks or at the end of each day of engagement and never more than 24 h after the original observation to prevent the risk of memory fading and details being lost [8,16]. Such accounts were accompanied by the researcher's insights and interpretations of events which contributed to the understanding of the setting and a narrowing of the research lens [8]. Throughout this process, the research team acted as "critical friends" and theoretical sounding boards, encouraging lead author reflection and interpretation of the themes which became central throughout the data collection period [23].

Data analysis

Data obtained through the semi-structured interviews, field notes (*via* participant observations) and the focus group were audio and visually recorded using a portable Dictaphone and Microsoft Teams, then transcribed verbatim. Data were thematically analysed manually using reflexive thematic analysis recommendations such as data familiarisation, generating initial themes, coding and finalising patterns of shared meanings underpinned by a central concept, and writing up using data extracts interspersed with researcher insights and interpretations [19,22]. Although the data themes generated were deductively linked in relevance to the pre-determined categories formed by the CFIR-guided research questions, the patterns of shared meaning were generated, more inductively, from the data themselves allowing interpretation and researcher contextual awareness to be discussed [19]. Flexibility in analysis was driven by both the prevalence (number of service users articulating the theme) and the importance placed on information [19,22]. Primary analysis was conducted by the first author with frequent debriefing sessions with the research team to discuss, challenge and reframe the thematic structure [22–24]. It is important to note that "data saturation" or "data adequacy" could be assumed as no new themes were identified when analysing the final few transcripts [17,19].

Lead researcher positioning

Given this study was based upon ethnographic principles, lead researcher self-reflexivity was important due to researcher background and training within clinical exercise provision [25]. Such experiences could influence participant interactions, provide pre-conceived ideas regarding exercise provision and enable a broader interpretation of participant concerns or thoughts [25]. Such reflection means that this article will retain the use of "I," "me," or "my" on occasion and as such refers to the first author [25].

What follows is my (the researcher's) story of "self" experiences, alongside the "other," in this case, the collective thoughts of staff and service users concerning their cultural experiences within a clinical exercise service [25,26]. Each CFIR section explored staff participant perspectives, their lived experiences and feelings, and my observations [25,26]. Service user perspectives were captured relating to resources and challenges, alongside their interactions with staff and experiences within the service. The data extracts represent each individual's experiences and opinions at a given time; however, taken in combination with my observations, this re-creates a holistic view of experience that is representative of what any individual may be exposed to in the service at a point in time [25,26]. There is an effort towards emphasizing the "... personal and 'real' nature of an individual self, identity, experience and subjectivity." [26], yet, acknowledgment that these are constructed through social interaction and that socio-cultural factors colour a person's sense of self, or identity [27].

As a Registration Council for Clinical Physiologists (RCCP) registered Clinical Exercise Physiologist (CEP) who has completed a similar role previously, I knew it would be hard to avoid assumptions regarding service operations such as assessment protocols, programme design, exercise delivery or even the referral process. I acknowledge that I needed to see past my own preconceptions and review what was happening within the service. However, these preconceived ideas (that I carried with me) were used to assist me in probing further into areas that I may not have 'seen' directly; areas that I felt probably existed but only to those who were behind the scenes such as the level and appropriateness of staff training and qualification levels. As my time within the service increased, I forged a closer relationship with staff enabling all parties to speak more openly and candidly. Rapport was developed and any researcher vs participant barriers were seemingly lowered after the initial 3–4 weeks. At the outset I would have classified myself as an outsider in collaboration with insiders given that I approached the service to observe it [27,28]. Yet, after this initial period (3–4 weeks) and given my background within clinical exercise delivery, the relationship felt like it had morphed into one of an insider in collaboration with other insiders due to flowing conversations and a mutual respect developed forged through shared experiences [27,28]. For example, staff began to ask my opinion regarding exercise prescription design and the practicalities of one-to-one versus group exercise sessions. These areas that were closed off in the early weeks, potentially due to limited trust or credibility, but over time these discussions increased in frequency and shifted into a two-way dialogue.

The first meeting

I was first introduced to the exercise team during their weekly (virtual) debrief. I can only assume that this experience was as daunting for them as it was for me. At this point in time they had little knowledge of me, my background, my agenda or how I might portray them and their service. What made this initial meeting more challenging was its online format. Although ethnographic research has been conducted in online forums, a true representation and sense of feeling displayed by levels of interaction can be more challenging as participants can be unseen or hidden behind their device [29]. After a brief introduction I verbally explained my purpose (to gain a greater understanding of what knowledge, skills and competencies were required to work within their service, how an effective service team operates and the challenges they face in delivering effective provision). Following this, I paused to allow time for questions/concerns (of which few were raised). I felt my research aims were understood and an acceptance of me (given my background in the delivery of clinical exercise) was initiated. For the rest of the meeting, I maintained a bystander/observational position. The meeting continued. Hearing the staff discuss the service users and protocols made it clear from the outset that this group of practitioners were tightly knit, truly invested in their workplace and passionate about the service they provided, most of whom had been there since its formation. I left the meeting feeling that, as a group, they did not view themselves as just exercise practitioners; there was a caring intent focused on providing an effective service in relation to the goals of the patient, an effectiveness which has been criticised in the past from a patient outcome perspective, mainly in relation to physical goals [30,31]. This desire to care for their service users was captured by Staff 5, "We're not just a program that supports people in exercise...we provide so much support to holistically to help them have a better quality of life." Table 3 illustrates the themes

and subthemes identified during the analysis, supported by verbatim quotes focusing on which staff knowledge, skills and competencies contribute to the provision of an effective clinical exercise service, how an effective service team is created, and the challenges faced when running a clinical exercise service.

CFIR results and discussion

CFIR Section 1.1 – collaborative working

Throughout my observations it became clear that at the forefront of service decisions were patient needs. Discussions around service inception demonstrated that many moving parts were involved in shaping the delivery model into a comprehensive patient-centred care package:

...our service was so considered in its design. We collaborated with leaders in the field and had a huge service user involvement at the start...it's that service user involvement which has led to the effectiveness of the program...they're [service users] the guys who said actually no, you don't want it in a clinical setting, you want it in a community setting...you don't want to do it that way, you need to ask this question. It was designed by the people who were going to use it and not by the people who thought of the outcomes. (Staff 4).

The collaborative nature of service design is not unusual and has been identified as good practice when multiple stakeholders are involved [32]. The design of the service was led by the NHS clinical leads (e.g., Clinical Head of Division for Anaesthesia) who retain responsibility for high quality care provision, in conjunction with the clinical expertise and operational management knowledge from a wide range of academics and clinical colleagues from other cancer services. The NHS contract, service specification, commissioning discussions and the recurrent funding was accredited to the work undertaken by the NHS programme manager in collaboration with the P4C programme leads with input from clinicians within the Greater Manchester cancer alliance. Yet, this co-design process was not straight forward as described by staff 4:

...trying to get everybody around the table was a huge challenge! There was some butting heads between clinical backgrounds and exercise professionals...everybody had to understand where their professional boundaries were, to be relaxed enough and confident enough to say, actually, NO! We can't do that. Or no, that is our remit. So, in the early days that was quite difficult."

The challenge of pleasing all parties is indicative of multi-stakeholder collaboration [32]. Yet, the expertise of the exercise specialists to articulate their requirements during the launch of the service displayed a level of confidence in their own proficiency that can only be gained through a combination of experience (workplace craft), education and a fundamental belief that they know what works and have an (robust) evidence base to justify and substantiate their position/stance [33,34]. Further, such skills were evident when discussing their own team environment "...we work as a team... it's about getting the right people for the right roles" (Staff 5). The importance of such knowledge, skills and competencies were highlighted when recruiting for exercise specialists:

...Staff need the right training such as exercise prescription and behaviour change...somebody's ability to communicate, empathize and work with a patient is what's going to engage and motivate that patient... (Staff 4)

In isolation, "right people for the right roles" could just refer to qualifications. Yet, on further exploration to be part of this team you had to convince the service lead and service users that

Table 3. CFIR sections and Sub-themes with additional supporting Quotes.

CFIR Section(s)	Sub-theme(s)	Quote or supporting text	Participant
1.0 Intervention development and challenges (e.g., reasons for the service delivery in a clinical or community setting)	1.1 Collaborative working	"referrals come directly from the from the CNS nurses... it's about making sure that health professionals understand (the benefits)...I think when certain health professionals haven't really been involved with this sort of thing before there can be a hesitation as to how this is going to be beneficial"	Staff 5
	1.2 Service adaptation	"blended approach to physical activity support... April 2019 and we were very much offering a face to face service... lung and colorectal and upper GI cancers... face to face assessment... questionnaires and paperwork to assess medical suitability. We emerged out of COVID, could get back into clinic and do some of the face to face appointment appointments. But we learned that things do work just as well sometimes on the telephone. So some of the things that we used to do in clinic we could do over the telephone such as the questionnaires (health screening) and some assessments such as sit-to-stand"	Staff 5
	1.3 Person-centred approach	"Ideally we want to work patients for a couple of months before they have any treatment, but in reality, it's not always that simple. We often get patients who literally referred and then a week later they go in for surgery"	Staff 6
2.0 Service user resources (e.g., hierarchy of working and challenges)	2.1 Patient resources, support & adaptations	"It was a very generalized booklet that we would give to everybody if the need arose. And I think in some ways, COVID allowed us to kind of hone in to the plan and consider what this actually needs to look like to be more effective for our patients... we were then able to then do assessments over the telephone and provide that home exercise plan for patients to do instead of using the gym"	Staff 5
3.0 Organisational structure (creation of team)	3.1 Organisation structure	"Exercise specialists are responsible for the exercise prescription for all of the patients entering onto the scheme and hosting the assessments...they do the exercise prescription and the exercise instructors take them (patients) through it as support"	Staff 1
	3.2 Staff roles and responsibilities	"(Work)...Are open to any training that you want to do. We have our CPD's, but if there's anything that's out of interest on any other courses, there will be an email sent through, you know, links to join on webinars and things like that...we did one for stoma care...as an exercise instructor we are constantly being asked what do you want to do? Where do you want to go?"	Staff 7
4.0 Staff knowledge (theoretical) skills (practical) & competencies (effectiveness)	4.1 Theoretical exercise knowledge	"A specialist qualification is always a good thing to have, it makes our team more diverse. We have people with the mental health, falls prevention, cardiac and pulmonary so any of those are brilliant...but really the baseline is undergraduate degrees, then cancer rehab"	Staff 4
	4.2 Skill application in the field	"I can only kind of draw on my own experiences...I've come through from a sports science undergraduate background. So obviously that's fundamental...most important is an awareness of communication styles and being able to flip your communication style and within seconds when you're meeting people so those skills, which are quite hard to assess and quite hard to prove I look for first and foremost"	Staff 5
	4.3 Competency – the ability to complete tasks effectively	"...patient care protocol is that every patient gets seen as by an exercise specialist at assessment in the prehab phase...stay with the them through prehab because things change really quickly...A patient may get handed off to our exercise instructors in rehab should they be on the universal arm of the program, that is a very independent, motivated, engaged patient with mild comorbidities, well controlled and everything went very smoothly in the operation"	Staff 4
5.0 Service effectiveness	5.1 Data monitoring and patient safety	"we obtain the key outcome data that we need to monitor the patients and also to ascertain whether the scheme was doing what it says on the tin essentially and supporting those patients to be fitter for surgeries or treatment"	Staff 5

sat on the interview panels (a stipulation of the co-design process) that you could communicate with a wide spectrum of stakeholders and had an up-to-date knowledge of cancer-related exercise literature. It was evident through our discussions that respect, sharing experiences and being transparent in their ways of working were traits that not only applied to patient care, but internally within the team environment. My observations led me to believe this was truly a collaborative service, both externally with partners, and internally across the team, driven by a need to provide knowledge driven patient centred care.

CFIR Section 1.2 service adaptation ~ COVID moving online...

The COVID-19 pandemic highlighted the flexibility of the service as the team transitioned from a face-to-face format to a virtual delivery model. I observed staff coach in front of a screen with minimal (if any) control over the service user environment, deal with increased levels of risk (managed by safety protocols they implemented such as fellow instructors observing without taking part, known as 'spotters') and have a reliance on patient honesty concerning how they were feeling (this is usual, but is often accompanied by other monitoring tools such as observation and talk test on an individual basis). This transition required high levels

of planning and implementation from an exercise specialist/patient perspective regarding environmental risk assessments, risk stratification of conditions, safe and effective exercise prescription and exercise delivery [35]. This process was again collaborative with ideas generated by the P4C exercise specialists in conjunction with the P4C clinical lead, the P4C programme manager and signed off by the P4C steering group. As we approached these online sessions, I had my own reservations. How would the observation of participants work and how will they control any potential adverse events such as home hazards and falls? As the sessions unfolded, my concerns were soon lessened. I was surprised how smoothly the sessions went. Service users actively provided perceived intensity level feedback and created space to ensure the surrounding area was free of hazards (e.g., furniture). On reflection I feel this came from the team's learned ability to coach participants within clinical exercise settings. The team's knowledge and understanding of risks (primarily risk prevention) from doing the job in a face-to-face setting, underpinned by their knowledge of the cancer-specific exercise literature through and in combination with their previous workplace experiences of exercise prescription design and delivery (craft development) [36] shone through. Session planning covered all potential condition-specific outcomes (specifically adverse) through risk stratification, whilst factoring in patient needs from the session (e.g., physical benefits, but also

social and psychological benefits *via* interaction with peers [37]). Communication skills (honed through team training in virtual settings) were excellent both verbally and visually (*via* demonstrations), and the ability of the staff to problem solve during sessions (e.g., technical difficulties) was akin to critical thinking originating from high volumes of practitioner experience. Such abilities displayed competency in delivering effective sessions. These qualities were driven by the exercise specialist's need to retain service provision during COVID-19. This transition to virtual delivery was however met with some initial trepidation, but it surpassed staff expectations regarding effectiveness; *"Surprisingly, I think it's been a positive thing, when we started this, I wasn't convinced that not having face-to-face would be the way to go"* (Staff 2). It does, however, remain questionable if such a transition would be as successful or even possible for clinical services that did not employ exercise specialist staff with such high levels of qualification, skills and experience.

Inadvertently, the forced change in format appeared to enhance the service provision in multiple ways. Originally the service was gym-based either through one-to-one or group attendance allowing service users to complete their individualised sessions with an exercise specialist overseeing [7]. Evidence suggests that the social aspect of physical activity aids engagement and adherence, however, no specific instructor-led group sessions were available akin to traditional exercise classes (e.g., circuit training) [37]. Logistical issues similar to the formation of any exercise service (e.g., venue availability, space, equipment) alongside concerns about trying to create too many exercise options too early, meant that more generic group classes were only explored more recently due to the success of the online sessions [7]. It was evident to all that social interaction between service users increased due to any group setting as long as the exercise class was appropriate. Once teething issues around technology were overcome, I witnessed generic group discussions, questioning (between service users) around condition management, shared experiences and a continuity of attendance which resulted in support networks being created similar to other physical activity interventions [37]:

...patient fears and anxieties towards exercise on top of the cancer diagnosis can be a bit of a barrier to participation in the scheme...the virtual/group model allows service users to overcome some anxiety by attending in their own homes and provides more patient-to-patient contact than our 1-2-1 delivery of the gym-based model (Staff 6)

Discovering that the online platforms can encourage similar social benefits to face-to-face exercise delivery was pleasing, but more satisfying to hear was that the service planned to continue with the blended option for the foreseeable future aligning with other conditions that have seen similar benefits [35,38].

CFIR Section 1.3 person-centred approach

6 weeks into my observation a plan to deliver face-to-face group exercise sessions whilst continuing with the home-based assessments/consultations which were found to establish better rapport, was established. This is a key concept. Firstly, understanding that rapport needed to be created to aid engagement is not something which should be taken for granted. This was a learning curve for the service given it was now aiming for group 'buy in' during sessions. Drawing upon both their educational knowledge and skills in supporting patient behaviour change, and their experience from delivering one-to-one sessions in person, the service manager (and team) realised they could enhance service provision through both virtual and face-to-face formats. Secondly, having the capacity to explore such options and recognising that a one

size fits all model rarely works requires the adoption of a critical mindset and the desire for continual improvement based upon reflection on practice and a highly educated, skilled and competent workforce to enable this:

...We're determined to blend the best practices of both models, face-to-face and virtually, one being the telephone assessment as it's a better way of introducing people to our services and developing relationships... non-attending is unusual now. (Staff 4)

Thus far the focus has concentrated on service user needs, however, psychological support, counselling and training was also vital for the exercise specialists. During discussions staff expressed that a shift to home-working was efficient for them personally (no travelling), increased engagement with service users (very few wasted appointments) and catered to patient needs (service remained operational). Yet, from personal perspectives, there were negative connotations of home-working. Staff openly discussed the self-isolation and personal wellbeing fears they had developed once an initial 4-week period of home-working had passed:

...being involved in long conversations can be draining... service users might be isolated themselves and offload all their feelings and concerns on you; a cancer diagnosis is stressful, but for me, when I was out in the centres I can escape and switch off somewhat, sometimes at home that's hard to do (Staff 1)

Given the complexity of managing a service and the logistics of maintaining exercise provision, it was refreshing to discover that the psychological support and training that had been made available to the team from service conception, had expanded during the pandemic:

...our lead psychologist has protocols in place to protect the team who were constantly speaking to people for six hours a day in high stress, high trauma situations. There is a lot of unloading by service users on to the team which could impact their mental health, even more now that they were all working from home (Staff 4)

Although the intention was to aid staff wellbeing, there is no doubt that this extra support and training will have translated into teachable moments useable for both themselves in a personal capacity, but also for service users when discussing cancer diagnosis, treatments and in some cases negative outcomes.

CFIR Section 2: Service user resources and support

Throughout my time in the service it was evident that the service users appreciated the care and attention they received:

...I think staff proactiveness, constant contact from assessment to induction, they went through questionnaires, they followed up with calls or reminders...people struggle to remember things so the support was brilliant (Service User 1)

Service users ($n=9$) spoke to me about their appreciation of having access to this service. More interestingly, the recognition of specialist skills by service users was evident. Firstly, they identified that exercise specialists in this service could discuss complex conditions and surgical procedures due to their in-depth knowledge of cancer:

...they made things understandable, both the reasons why I needed to exercise and the benefits of doing it for my recovery...I wanted to know my limits after surgery...they helped me progress back to a normal life (Service user 4)

Secondly, they highlighted the excellent communication skills staff possessed (i.e., listening and asking questions) to engage the patient further “...(staff) understanding and interest was spot on...I spoke to them about what I’ve gone through and they listened to me” (Service User 2). These interactions provided teachable moments in lifestyle education between staff and service users whereby staff utilised empathetic behaviour skills to enhance confidence in the patient/staff relationship. For example, a brief conversation with service user 7 during some cycling demonstrated to me that not all participants enjoyed exercise, “I don’t like getting all sweaty”. Yet, in the same breath they realised its importance as it had been explained during lifestyle discussions with the staff;

...the chemotherapy decimated my body cells...I’m not a fan of exercise, but the three months I was given (at the gym) helped me to get back on my feet. I learned (from the staff) that exercise (and its benefits) would help me overcome this (cancer) (Service user 7)

Although the service design changed during COVID-19, access was maintained and supporting literature (e.g., home exercise programmes) were improved, but these are changes that can fundamentally be made by any service. My impression, however, was that alongside cancer-specific knowledge, the variety of psychosocial skills (e.g., the ability to communicate clearly both verbally and visually, interpersonal skills and traits that pertain to empathetic personalities, positive attitude, active listening, emotional intelligent and non-judgemental behaviour) utilized by staff and previously acknowledged in oncology pathways [39–41] raised this service to a level that surpassed service user expectations:

...the training they (exercise specialists) have is amazing, everyone (service users) feels comfortable, no one feels judged, we’re all at different stages of our journey but staff make you feel like you can participate, they are an invaluable outlet (Service User 5).

CFIR Section 3.1: Organisational structure

A clear staff structure was evident within the exercise delivery team with additional clinical leadership, supervision and governance provided by the wider NHS-based multi-disciplinary team (MDT) which included the P4C Clinical Lead and the Programme Lead, as well as other members of the Greater Manchester Cancer Alliance and programme steering group. The exercise delivery team was led by the programme manager (current Master degree student, undergraduate degree qualified with multiple specialist exercise instructor vocational qualifications), with exercise specialist instructors ($n=4$) (undergraduate degree with exercise instructor vocational qualifications) and exercise instructors ($n=2$) (exercise referral vocational qualification) (Table 2). A hierarchical structure existed concerning service protocols and decisions (programme manager responsibility with approvals from the clinical leadership team), yet my observation of team meetings gave me a feeling of staff unity without egos or superiority. Staff appeared to interact on an equal footing without rank or marginalisation. Management proactively encouraged conversation and opinions which in my mind enhanced empowerment and inclusivity. One example is the interworking between staff to manage exercise delivery while retaining a level of hierarchy:

... Once they’ve done their assessment the exercise specialists would write the program and pass it over to the exercise instructors. They adjust it when needed, send it to the exercise specialists to check and sign off (Staff 1)

In this case, there was a skillset and scope of practice recognition. Staff adhered to their professional boundaries, communicated changes within those parameters, yet retained a team ethos which supported peer learning and development akin to previous scientific literature [42].

CFIR Section 3.2: Staff roles and responsibilities

Another area recognised as contributing to service effectiveness is internal professional development through the use of peer training and support [42]. Peer training is the passing on of knowledge and skills, potentially to less qualified or experienced staff, to enhance the wider skillset of the team and allow craft (on the job) learning to occur [36]. Learning can take many forms (e.g., observation or undertaking unfamiliar tasks) to aid personal skill attainment [36]. One task (not necessarily documented) for exercise specialists was this fostering of progression of their (less qualified) exercise instructor counterparts by mentoring and developing their skillsets, expanding their levels of responsibility and experience allowing them to grow and learn within the service [36,42]. Internal, peer-supported staff development might be idealistic rather than realistic in most workplaces due to working policies, time constraints or poor levels of peer support [36,42]. Soukup et al. [42] suggest that clinical service staff should recognise each other’s abilities and value opinions on an equal footing, reinforcing collaborative working and ultimately improving patient decision making through shared craft learning. This, however, stems from a highly qualified leadership team that encourages teamworking, patient-centredness, equality and inclusiveness as they are comfortable in their service structure and not threatened by team member progression [42]. Anecdotally, clinical settings can be less friendly in nature with various exercise practitioners disagreeing over roles, responsibilities, scope of practice and seniority which can impact their willingness to support the development of peers. In my experience this came from a lack of team morale, low levels of management support/implementation, and perceptions around levels of knowledge, skills and competency in roles, potentially due to some roles being occupied by non-accredited exercise professionals. On the contrary, this service dispelled my preconceived ideas and experiences as captured eloquently by staff:

...giving exercise instructors the responsibility to be able to develop as an individual and to potentially be an exercise specialist themselves is very important, we need to foster that pathway for them to improve and develop...they are very competent but it is about challenging them (Staff 5)

CFIR Section 4.1 theoretical exercise knowledge

It is established and is my belief, that exercise testing, assessment, interpretation, prescription, delivery and outcomes evaluation for individuals with chronic and complex conditions requires a specialist knowledge base and expertise [4,33]. Exercise specialist staff in this service were aligned to their level of qualification and expertise. Prehabilitation service users, those at higher risk (targeted) and all data point assessments were completed by exercise specialists, whereas lower risk service users undertaking rehabilitation (minimal co-morbidities) or those with more generic/universal needs (low risk stratification) could work with the exercise instructors (Table 2). Nationally, job roles and levels of education across clinical exercise staff vary with differences noted within specific areas of provision (e.g., cardiac) and across conditions

(e.g., stroke vs. cancer) [5]. This service was unique due to their hierarchical format of exercise delivery and because of their exercise specialist qualification levels [5]. Against the grain, this service built their foundations on educational backgrounds citing that an undergraduate degree in a sports and exercise science-related subject plus vocational cancer qualifications were essential (Staff 4,5,7). A degree in a sport and exercise science was identified as providing a knowledge base in exercise screening, assessment and prescription; key areas in delivering clinical exercise services [4,33]. Although the degrees referenced were sport and exercise science-related, no staff had completed a master's degree (MSc.). Interestingly, only 1% of exercise staff within cancer services had an MSc. in CEP [5]. Conversely, 18% ($n=61$) of exercise staff employed within cardiac services were MSc qualified CEPs [5]. During discussions, no staff mentioned post graduate qualifications as a pre-requisite for their role nor deemed that this level of qualification could provide the diverse knowledge required within the service. On reflection, this could be attributed to their current (high) levels of qualification and experience in this specific field, rather than the wider cancer landscape. My impression of the cancer landscape is that the sudden demand for an exercise pre/rehabilitation workforce outweighed the ability to pursue a higher qualification level, this combined with a leisure centre delivery model meant that exercise instructors (vocationally qualified without degrees) were the most accessible and possibly convenient solution for exercise intervention delivery [34]. One area of concern raised was the lack of suitable training in prehabilitation-based exercise prescription itself. Fundamentally, in any workspace where there are advances in practice there needs to be an evolving and relevant continued professional development (CPD) obligation. Yet, in this case, the potential issue was offset by the innovative use of the wider MDT clinical team who provided regular in-house CPD in cancer-specific pathophysiology which assisted the team to develop suitable exercise prescription. Staff appeared to gain deep levels of understanding about cancer-specific treatments and complications from workshops that were delivered by health practitioners. Albeit, not exercise prescription-specific, this additional application-based knowledge obtained from highly experienced professionals allowed them to hone and refine their broader knowledge, but also provided opportunity for questions that could assist in improving their skills and competencies, thus raising their own standards in line with higher levels of qualifications [36].

CFIR Section 4.2 skill application in the field

Clinical exercise skills are linked to patient assessments, interpretation of outcomes, risk stratification and screening, exercise prescription design and delivery (including monitoring) and the ability to communicate all of the above effectively [4,43]. It was clear to me that listening and communication were paramount and on an equal footing within this service, an area that is frequently discussed in clinical service provision [42]. Watching staff interact with diverse communities in places that were out of peoples' comfort zones (e.g., leisure centres) reaffirmed that without the ability to listen, gain trust and confidence, and to communicate suitably, the whole service would be pointless. Empathy, understanding stages of lifestyle change and recognising the need for autonomy for service users, learned throughout their qualifications (mainly their degrees according to staff) were essential, coupled with on-the-job experience (learning from peers and previous interactions) [36]. Staff pointed out that cancer, like most long-term conditions, does not have one demographic or typology, so the

way in which they were able to reassure and support people from all walks of life underpinned all facets of the service:

... we need to communicate effectively with service users, have a bit of empathy, you need to have people skills, you can't be a robot, you need to see them as a person not just as a cancer patient with a cancer diagnosis (Staff 1)

Staff frequently mentioned that service user motivation to attend cancer rehabilitation was low with service users questioning the need and benefit of exercise. I witnessed first-hand the ability of staff to communicate, empathize, 'see' and understand service users from a psychological perspective, then educate them as individuals that created the 'buy in' and personal motivation to begin and adhere to the programme [42].

Staff acknowledged that a prehabilitation offering was a useful step in the behaviour change process as the majority of people want to do all they can to get fitter and stronger before treatment as a way of improving outcomes. This is, however, only a short-term means to an end or fix (i.e., they want to get fitter before the operation) and once completed has no bearing on any future behaviours as it was an externally motivated goal [44,45]. On the contrary, the empathetic, more autonomous approach demonstrated within this service has been shown to aid long-term behaviour changes [7,46]. Multiple techniques to promote/encourage behaviour change were used depending on patient needs, for example motivational interviewing, healthy behaviour education and peer-to-peer support by way of a buddy system [46]. It cannot be underestimated how important it is for such skills (theoretically learned in an academic setting) to be polished through real-life application [36]. However, due to intervention restrictions (12 weeks attendance per patient) and individual session durations (usually 1 h), these techniques often relied on the assumption that if people were shown what to do they will do it, which evidence suggests is not always the case [47]. To offset this, and learned through experience, staff used relaxed discussions around areas of patient interest to pick up on any bits of information that could help them promote behaviour change [36,46]. This subtle, non-prescribed approach of integrating behaviour change information into discussions or environments (e.g., 'teachable moments' during consultations) opposed the less effective practices of including formal education sessions after each exercise session, therefore requires consideration within service behaviour change strategies [46].

CFIR Section 4.3 competency – the ability to complete tasks effectively

Within any exercise service delivery, there are a number of key competencies, one being clinical assessments [43]. Gold standard clinical assessments may include Cardiopulmonary Exercise Tests (CPET) or Exercise Tolerance Tests (ETTs) [48]. Yet, in community venues not conducive to such assessments, field tests (e.g., six-minute walk test or sit-to-stand) were the next best thing and are frequently used [49,50]. Although being effective in delivering assessments is important, it was pointed out to me that "anyone can teach someone to complete an assessment" (Staff 1) indicating the real competency came in the translation of results:

...you need to be able to complete an assessment effectively, but then be able to interpret those results, if you've got any concerns, you need to be confident enough to refer back to the CNS (Clinical Nurse Specialist) (Staff 1).

This was refreshing to hear from a 'best practice' viewpoint. Even more encouraging was that staff understood the importance

of applying this data to individualised exercise prescription, “it’s the practical application...it’s all well and good having all of this knowledge and doing these tests. But if you can’t put it into practice it’s pretty useless” (Staff 6). Staff accredited these competencies to both their undergraduate degree training (e.g., interpretation of data) and craft experience in the role (choosing the correct assessment) endorsing the belief that exercise application cannot take a one size fits all approach. This combination of theoretical and practical learning sees skills and competency merge by way of risk stratification, functional assessment and the ability to utilize and interpret formulas and relevant results into a meaningful exercise prescription. This is where the specialist nature of the role lies. Writing safe and effective exercise prescription is clearly at the forefront of any service, yet sufficient knowledge, skills and competencies are rarely learned through training alone [36]. There is an element of ‘craft’ and professional development forged through workplace mentoring and learning [36]. I can only compare it to the work of Tribble and Newburg [36] who identify that surgery is ‘more about decisions than incisions’. In an exercise environment this translates into implementing your knowledge based on a sound rationale, something which is learned over time and not necessarily part of your initial training, an example being the fostering of progression that is built into the service:

...we (exercise specialists) give the exercise instructors the responsibility to develop as an individual and potentially become an exercise specialist themselves. I think it is very important that we foster that pathway for them to improve and develop...we wouldn’t give anybody complex (to them) just because of the knowledge and the understanding, but they are very competent (Staff 5)

It was clear that theoretical knowledge, skill application and competency (effectiveness), alongside craft-based knowledge (and learning) interact simultaneously during a working day [51]. Further, these competencies or qualities (effective communication, professionalism, assessment and interpretation, exercise planning and delivery, lifestyle change and risk management) were consistently visible within this service [51]. Although this service employed exercise specialists, their job titles did not reflect their overall abilities; staff were educated to higher levels than vocationally-qualified peers with the same title, presenting an anomaly when describing the service as ‘exercise instructor-led’ rather than physiotherapy or CEP-led.

CFIR Section 5.1: Service effectiveness - data monitoring and patient safety

My experiences have shown me that service effectiveness can be subjective and alter depending on the lens you are viewing through, yet in this case all staff overwhelmingly championed the provision:

... everything is covered, you have contingencies for all areas such as safety protocols - every base is covered for the team. We’re organized and have efficient processes, we’re all very much on the same page that provides a continuity of care which is fundamental (Staff 5).

In this case, effectiveness could be viewed from multiple perspectives. Safety protocols were a priority and devised by the lead exercise specialist in conjunction with the wider MDT who together have experience of risk assessment, data protection, safeguarding and exercise-specific contingencies in case of injury or illness. Effectiveness can also refer to patient outcomes through objective measures (e.g., fitness outcomes). Staff cited the numerous data points gathered from assessments, a continuity of referral processes and the ability to adapt and maintain the service

through COVID as key demonstrators of effectiveness. Objective cardiovascular and muscular strength and endurance assessments at point of referral, pre and post-surgical intervention and post-intervention, provided those funding the services with an overview of the improved health profiles of service users. Moreover, these positive assessment outcomes provided evidence that the exercise prescription and delivery was effective across all formats. In addition, the subtle use of communication skills, high levels of staff morale and the autonomy provided by service managers engaged the service users throughout their journey [44,46]. Other than attendance figures, the subjective nature of human interaction driving service effectiveness can be hard to decipher, yet in this case the feelings and experiences shared explained the high levels of adherence. It would be remiss of me not to acknowledge the ability of the service to adapt to change given the recent COVID pandemic. I witnessed a new age of clinical exercise provision and one that was able to be effective (according to both staff and service users) in its ability to engage its target audience, even if it was not able to be as objective in a physical assessment capacity due to the remote delivery.

Recommendations

Three primary recommendations have been identified for clinical exercise service provision in current or new services:

1. Clinical exercise staff knowledge, skills and competencies should be underpinned by undergraduate degrees in sport and exercise science-related subjects or higher. The level of qualifications shown in this study were comparable to that of a registered clinical exercise physiologist (according to the RCCP equivalence pathway), rather than vocationally qualified exercise instructors. Therefore, for effective service provision staff are recommended to be educated at this level.
2. Workplace experience and craft is vital for exercise specialists to develop their knowledge, skills and competencies in real-world settings and highlights the importance of practice-based learning.
3. Underpinning behaviour change and communication skills, specifically empathy and listening skills, should be incorporated into CEP training. Services should look to invest time in developing staff behaviour change skillsets, but also review the evidence that suggests rigid and traditional models of delivery to service users require modification and exploration.

Future research

Future research should explore daily practices within clinical exercise services across other long-term conditions to assist in the generalisation of findings. These observations should consider different staffing structures (e.g., CEP-led provision), distinct educational backgrounds (e.g., MSc. qualified) to gain an understanding how it may impact knowledge, skills and competencies, multiple condition exercise delivery settings and research-focused services to ensure currency in the field of practice.

Limitations

By design, the study was conducted as a single service case study focusing on one long-term condition, therefore limited by a small,

convenience sample. This was demonstrated by the low duration service user focus group. Some caution must be taken in generalising across the cancer landscape as this service is not freely commissioned or widely available in the UK, job titles did not necessarily match staff qualifications and it does not have a research component within the service that can progress the learnings within the field. It does, however, go some way in explaining the key considerations for effective clinical exercise provision for cancer.

Conclusion

This community-based, cancer-specific clinical exercise service collaborated with healthcare professionals and service users at inception to develop a nationally recognised referral pathway. Exercise specialists, with equivalent education and experience to RCCP-registered CEPs, were able to prescribe and deliver exercise based on high levels of cancer-specific knowledge, skills and competency, underpinned by undergraduate degrees and facilitated by peer learning and CPD-based training delivered by healthcare professionals from the wider MDT. Behaviour change was delivered through patient-centred communication that focused on building patient rapport and used subtle, informal messaging during conversations to reinforce effective, cancer-specific and generic lifestyle advice. Finally, the ability to offer menu-based exercise through online consultations/group exercise sessions, alongside in person, one-to-one appointments across a vast amount of venues, was highlighted by staff and service users as creating effective patient-centred care.

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Patient involvement

Patient involvement was completed during the ethics application with a conclusion that the research methods were suitable with exploration required in this area.

Author contributions

AC contributed to the design of the study, collected and analysed the data, and led the writing of the manuscript. HJ and DJG secured funding for the study. PW, HJ, LG and DR contributed to the study design and advised on data collection and analysis. All authors contributed to data interpretation and writing of the manuscript and approved the final version.

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Data availability statement

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

References

- [1] Alderwick H, Dixon J. The NHS long term plan. *BMJ*. 2019;364:l84.
- [2] Lafond S, Charlesworth A, Roberts A. A perfect storm: an impossible climate for NHS providers' finances? 2016.
- [3] Office for National Statistics People with long-term conditions: UK 2019 available at: people with long-term health conditions. 2019.
- [4] Jones H, George KP, Scott A, et al. Charter to establish clinical exercise physiology as a recognised allied health profession in the UK: a call to action. *BMJ Open Sport Exerc Med*. 2021;7(3):e001158. doi: [10.1136/bmjsem-2021-001158](https://doi.org/10.1136/bmjsem-2021-001158).
- [5] Crozier A, Watson PM, Graves LEF, et al. Clinical exercise provision in the UK: comparison of staff job titles, roles and qualifications across five specialised exercise services. *BMJ Open Sport Exerc Med*. 2022;8(1):e001152. doi: [10.1136/bmjsem-2021-001152](https://doi.org/10.1136/bmjsem-2021-001152).
- [6] MacMillan Cancer Support, RCoA, the National Institute for Health Research. Prehabilitation for people with cancer: principles and guidance for prehabilitation within the management and support of people with cancer. 2019.
- [7] Moore J, Merchant Z, Rowlinson K, et al. Implementing a system-wide cancer prehabilitation programme: the journey of greater manchester's 'Prehab4cancer'. *Eur J Surg Oncol*. 2021;47(3 Pt A):524–532. doi: [10.1016/j.ejso.2020.04.042](https://doi.org/10.1016/j.ejso.2020.04.042).
- [8] Krane V, Baird SM. Using ethnography in applied sport psychology. *Journal of Applied Sport Psychology*. 2005;17(2):87–107. doi: [10.1080/10413200590932371](https://doi.org/10.1080/10413200590932371).
- [9] Damschroder LJ, Aron DC, Keith RE, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implementation Sci*. 2009;4(1):1–15. doi: [10.1186/1748-5908-4-50](https://doi.org/10.1186/1748-5908-4-50).
- [10] Downey J, Shearn K, Brown N, et al. Behaviour change practices in exercise referral schemes: developing realist programme theory of implementation. *BMC Health Serv Res*. 2021;21(1):1–9. doi: [10.1186/s12913-021-06349-9](https://doi.org/10.1186/s12913-021-06349-9).
- [11] Stetler CB, Legro MW, Wallace CM, et al. The role of formative evaluation in implementation research and the QUERI experience. *J Gen Intern Med*. 2006;21(S2):S1–S8. doi: [10.1007/s11606-006-0267-9](https://doi.org/10.1007/s11606-006-0267-9).
- [12] Smith JA. Semi structured interviewing and qualitative analysis. 1995.
- [13] Davies CA. Reflexive ethnography: a guide to researching selves and others. Routledge; 2012.
- [14] Turner GL, Owen S, Watson PM. Addressing childhood obesity at school entry: qualitative experiences of school health

- professionals. *J Child Health Care*. 2016;20(3):304–313. doi: [10.1177/1367493515587061](https://doi.org/10.1177/1367493515587061).
- [15] Hoffmann TC, Glasziou PP, Boutron I, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ*. 2014;348:g1687. doi: [10.1136/bmj.g1687](https://doi.org/10.1136/bmj.g1687).
 - [16] Emerson RM, Fretz RI, Shaw LL. *Writing ethnographic field-notes*. Chicago: University of Chicago; 1995.
 - [17] Hennink MM, Kaiser BN, Weber MB. What influences saturation? Estimating sample sizes in focus group research. *Qual Health Res*. 2019;29(10):1483–1496. doi: [10.1177/1049732318821692](https://doi.org/10.1177/1049732318821692).
 - [18] Shaw R. Embedding reflexivity within experiential qualitative psychology. *Qualitative Research in Psychology*. 2010;7(3):233–243. doi: [10.1080/147808802699092](https://doi.org/10.1080/147808802699092).
 - [19] Braun V, Clarke V. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qual Res Sport Exerc Health*. 2021;13(2):201–216. doi: [10.1080/2159676X.2019.1704846](https://doi.org/10.1080/2159676X.2019.1704846).
 - [20] Kitzinger J. The methodology of focus groups: the importance of interaction between research participants. *Soc Health Illness*. 1994;16(1):103–121. doi: [10.1111/1467-9566.ep11347023](https://doi.org/10.1111/1467-9566.ep11347023).
 - [21] Kidd PS, Parshall MB. Getting the focus and the group: enhancing analytical rigor in focus group research. *Qual Health Res*. 2000;10(3):293–308. doi: [10.1177/104973200129118453](https://doi.org/10.1177/104973200129118453).
 - [22] Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qual Res Sport Exerc Health*. 2019;11(4):589–597. doi: [10.1080/2159676X.2019.1628806](https://doi.org/10.1080/2159676X.2019.1628806).
 - [23] Wolcott HF. *Writing up qualitative research*. London: Sage Publications; 2008.
 - [24] Costa AL, Kallick B. *Through the lens of a critical friend*. Education Leadership. Westport, CT: USA 1993;51:49–49.
 - [25] Foley DE. Critical ethnography: the reflexive turn. *Inter J Qual Stud Educ*. 2002;15(4):469–490. doi: [10.1080/09518390210145534](https://doi.org/10.1080/09518390210145534).
 - [26] Smith B, Sparkes AC. Contrasting perspectives on narrating selves and identities: an invitation to dialogue. *Qual Res*. 2008;8(1):5–35. doi: [10.1177/1468794107085221](https://doi.org/10.1177/1468794107085221).
 - [27] Agar M. Ethnography reconstructed: the professional stranger at fifteen. *The professional Stranger*; 1996: p. 1–51.
 - [28] Herr K, Anderson GL. *The action research dissertation: a guide for students and faculty*. Sage publications; 2014.
 - [29] Howlett M. Looking at the ‘field’ through a zoom lens: methodological reflections on conducting online research during a global pandemic. *Qual Res*. 2022;22(3):387–402. doi: [10.1177/1468794120985691](https://doi.org/10.1177/1468794120985691).
 - [30] Rowley N, Steele J, Mann S, et al. Delivery approaches within exercise referral schemes: a survey of current practice in England. *J Phys Act Health*. 2021;18(4):357–373. doi: [10.1123/jpah.2020-0388](https://doi.org/10.1123/jpah.2020-0388).
 - [31] Steele J, Wade M, Copeland RJ, et al. The national ReferAll database: an open dataset of exercise referral schemes across the UK. *IJERPH*. 2021;18(9):4831. doi: [10.3390/ijerph18094831](https://doi.org/10.3390/ijerph18094831).
 - [32] Buckley BJR, Thijssen DHJ, Murphy RC, et al. Making a move in exercise referral: co-development of a physical activity referral scheme. *J Public Health (Oxf)*. 2018;40(4):e586–e593. doi: [10.1093/pubmed/fdy072](https://doi.org/10.1093/pubmed/fdy072).
 - [33] Warburton DE, Bredin SS, Charlesworth SA, et al. Evidence-based risk recommendations for best practices in the training of qualified exercise professionals working with clinical populations. *Appl Physiol Nutr Metab*. 2011;36(S1):S232–S265. doi: [10.1139/h11-054](https://doi.org/10.1139/h11-054).
 - [34] Renouf T, Bates A, Davis JF, et al. Prehabilitation. An interdisciplinary Patient-Centric conceptual framework. *Semin Oncol Nurs*. 2022;38(5):151329. doi: [10.1016/j.soncn.2022.151329](https://doi.org/10.1016/j.soncn.2022.151329).
 - [35] Ganeshan S, Tse C, Beatty A. Home-based cardiac rehabilitation during COVID-19: a Qualitative Study. 2021.
 - [36] Tribble C, Newburg D. Learning to fly: teaching mental strategies to future surgeons. *J Excellence*. 1998;1:6–19.
 - [37] Crozier A, Porcellato L, Buckley BJR, et al. Facilitators and challenges in delivering a peer-support physical activity intervention for older adults: a qualitative study with multiple stakeholders. *BMC Public Health*. 2020;20(1):1–10. doi: [10.1186/s12889-020-09990-x](https://doi.org/10.1186/s12889-020-09990-x).
 - [38] Lewis A, Knight E, Bland M, et al. Feasibility of an online platform delivery of pulmonary rehabilitation for individuals with chronic respiratory disease. *BMJ Open Res*. 2021;8(1):e000880. doi: [10.1136/bmjresp-2021-000880](https://doi.org/10.1136/bmjresp-2021-000880).
 - [39] Dal Mas F, Biancuzzi H, Miceli L. The importance of soft skills in Co-Production of healthcare services in the public sector. In: *Soft skills for human centered management and global sustainability*. London: Routledge; 2021. pp. 110–126.
 - [40] Gibb S. Soft skills assessment: theory development and the research agenda. *Inter J Lifelong Educ*. 2014;33(4):455–471. doi: [10.1080/02601370.2013.867546](https://doi.org/10.1080/02601370.2013.867546).
 - [41] Snell S, Snell-Siddle C, Whitehouse D. Soft or hard boiled: relevance of soft skills for is professionals In: *Proceedings of the 15th Annual Conference of the National Advisory Committee on Computing Qualifications*. 2002.
 - [42] Soukup T, Lamb BW, Arora S, et al. Successful strategies in implementing a multidisciplinary team working in the care of patients with cancer: an overview and synthesis of the available literature. *J Multidiscip Healthc*. 2018;11:49–61. doi: [10.2147/JMDH.S117945](https://doi.org/10.2147/JMDH.S117945).
 - [43] CEP-UK, CEP. Clinical exercise physiology curriculum framework. 2021. https://www.clinicalexercise physiology.org.uk/_files/ugd/dc94ed_7c916b9cbf4f480a8c25a2b9f6aeeae7.pdf
 - [44] Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol*. 2000;55(1):68–78. doi: [10.1037/0003-066x.55.1.68](https://doi.org/10.1037/0003-066x.55.1.68).
 - [45] Teixeira PJ, Carraça EV, Markland D, et al. Exercise, physical activity, and self-determination theory: a systematic review. *Int J Behav Nutr Phys Act*. 2012;9(1):78. doi: [10.1186/1479-5868-9-78](https://doi.org/10.1186/1479-5868-9-78).
 - [46] Teixeira PJ, Marques MM, Silva MN, et al. A classification of motivation and behavior change techniques used in self-determination theory-based interventions in health contexts. *Motivation Science*. 2020;6(4):438–455. doi: [10.1037/mot0000172](https://doi.org/10.1037/mot0000172).
 - [47] Kelly MP, Barker M. Why is changing health-related behaviour so difficult? *Public Health*. 2016;136:109–116. doi: [10.1016/j.puhe.2016.03.030](https://doi.org/10.1016/j.puhe.2016.03.030).
 - [48] Arena R, Canada JM, Popovic D, et al. Cardiopulmonary exercise testing—refining the clinical perspective by combining assessments. *Expert Rev Cardiovasc Ther*. 2020;18(9):563–576. doi: [10.1080/14779072.2020.1806057](https://doi.org/10.1080/14779072.2020.1806057).
 - [49] Reyhler G, Boucard E, Peran L, et al. One minute sit-to-stand test is an alternative to 6MWT to measure functional exercise performance in COPD patients. *Clin Respir J*. 2018;12(3):1247–1256. doi: [10.1111/crj.12658](https://doi.org/10.1111/crj.12658).
 - [50] Raymond J, Sealey R, Naumann F, et al. Development of core clinical learning competencies for Australian exercise physiology students. *J Clin Exerc Physiol*. 2020;9(1):1–9. doi: [10.31189/2165-6193-9.1.1](https://doi.org/10.31189/2165-6193-9.1.1).
 - [51] Buckley BJR, Finnie SJ, Murphy RC, et al. “You’ve got to pick your battles”: a mixed-methods investigation of physical activity counselling and referral within general practice. *IJERPH*. 2020;17(20):7428. doi: [10.3390/ijerph17207428](https://doi.org/10.3390/ijerph17207428).