

ESNEFT Evaluation Report

Title: An evaluation of the effectiveness of a prehabilitation and rehabilitation pilot programme of cancer patients (based on NHS ESNEFT, Essex and Suffolk)

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“Getting a grip on the whole process, to make your treatment more bearable and effective, and your recovery speedier, and to make optimal use of the available support and resources on offer, could alter both your experience of cancer treatment, and the eventual outcome. It could transform a devastating year of feeling helpless and terrified, into a challenging opportunity to take back some control. There's a myth that adopting a positive attitude can help. Well it might, but you might want to rant and rave at the universe in anger, weep daily tears, or withdraw from the world into numb hibernation – and all those are legitimate responses too. But what evidence is there that anything you might decide to do can prepare you optimally for the rigours of the treatment you're about to embark upon?”

Prehabilitation for People with Cancer, Macmillan Cancer Support

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Executive Summary

East Suffolk and North Essex NHS Foundation Trust was formed on 1 July 2018 through the merger of Colchester Hospital University NHS Foundation Trust and The Ipswich Hospital NHS Trust. Within this Trust are located the Ipswich and Colchester Cancer Wellbeing and Information Centres that commissioned the current evaluation study.

This is an evaluation of a pilot project organised to test a model of prehabilitation and rehabilitation for patients, initially with a diagnosis of bowel cancer; the work was later broadened to include all cancer sites.

The project involved working collaboratively with the East Suffolk and North Essex cancer commissioning group (CCG) and the integrated care system (ICS), with the intention that the pilot informs and influences the scoping and commissioning of a model which is funded and available to all cancer sites and becomes part of the cancer patient pathway.

Key Findings

Data analysis based on the reported scores of the service under analysis suggests that participants taking part in the prehabilitation/rehabilitation program reduced their depression (non-significant result) and anxiety scores, enhanced their ability to perform daily tasks, increased the strength of their lower legs, and improved eating behaviour scores. All these improvements are in line with the positive effects of prehabilitation/rehabilitation services nationally and internationally, supporting the feasibility and potential of the service provided by ESNEFT in East Suffolk and North Essex (UK).

Actionable Recommendations

Based on the results of this evaluation report the effectiveness of the prehabilitation and rehabilitation pilot programme of cancer patients can be characterised as effective. Expanding the provision of related services for oncological patients can reduce health care costs, improve therapy responses, and support wellbeing in patients in need.

Report Impact

- The report provided clues on the positive impact the ESNEFT pilot program of prehabilitation/rehabilitation is having on its participants. This result is in line with evaluations of similar programs aimed towards the enhancement of functional ability, recovery and wellbeing of oncological patients.
- Additional resources and support seem to be needed during the first 2 to 3 months after the prehabilitation initiation, or else during the period of the oncological treatment (aka restorative rehabilitation). It is the period where most of the evaluated scores of participants showed deterioration.
- More emphasis is needed on patient recruitment and retention, making sure this pilot intervention program is accessible to more (if not all) oncological patients undergoing treatment.

Introduction

The ESNEFT cancer information centre has a steering group which meets quarterly and includes patient and carer representatives. The centre has a proven track record of working collaboratively with a number of stakeholders in order to improve services and meet the needs of people affected by cancer in Suffolk and North Essex.

The information centre has been a pilot site for the National Cancer Survivorship initiative and NHS England Quality of Life project and has worked closely with Active Suffolk and One life Suffolk on a number of health improvement projects over the last 8 years. The Active Wellbeing Service in collaboration with Active Suffolk, aimed to support cancer patients to improve their health & wellbeing by increasing their physical activity levels.

Over a 3 year period, patients received bespoke support from a handful of physical activity advisors and the evaluation data demonstrated that after just 3 months on the service, patients recorded 67% energy improvements; 42% mobility improvements; 50% sleep improvements; 77% patients achieved 60mins of activity per week; 75% personal wellbeing improvements and 58% confidence improvements, encompassing the significantly positive benefits that cancer patients feel and experience when they have access to such services. The centres work collaboratively with a wide variety of service providers and stakeholders in order to improve and develop services in order to address health inequalities, improve services and meet local needs.

The centre has an established exercise referral scheme with eight local partners across Suffolk. In partnership with Active Suffolk a twice yearly education day is run for all local exercise instructors to facilitate bespoke learning opportunities, peer support and a community of practice. Bursaries for local exercise professionals are also offered to support them to undertake their GP referral and can rehab level 4 training. This approach has ensured access to appropriately trained instructors who are motivated to support cancer patients effectively closer to home rather than attending hospital for exercise classes.

Context

Background

Prehabilitation is the first stage in the rehabilitation pathway, otherwise known as preventative rehabilitation, and is followed by restorative rehabilitation, normally referred to simply as rehabilitation.

Cancer prehabilitation, as defined by Silver and Baima (2013) is “a process on the continuum of care that occurs between the time of cancer diagnosis and the beginning of acute treatment, includes physical and psychological assessments that establish a baseline functional level, identifies impairments, and provides targeted interventions that improve a patient’s health to reduce the incidence and the severity of current and future impairments.”

The “Fit for Life” project is a pilot project to test a model of prehabilitation and rehabilitation for patients, initially with a diagnosis of bowel cancer; the contents of this pilot were later broadened to include all cancer sites.

The project involved working collaboratively with the East Suffolk and North Essex cancer commissioning group (CCG) and the integrated care system (ICS), with the intention that the pilot informs and influences the scoping and commissioning of a model which is funded and available to all cancer sites and becomes part of the cancer patient pathway.

Patients undergoing treatment for cancer are subject to adverse side effects caused by both their disease and treatments. Preparing patients through physical, nutritional and psychological interventions to undergo treatment is associated with positive outcomes, including reduced length of hospital stay and post-operative complications and improved recovery and quality of life. Prehabilitation is thus becoming increasingly widespread as a means to enable people with cancer to prepare for treatment through promoting healthy behaviours and needs based prescribing of exercise, nutrition and psychological interventions, and it is part of a continuum to rehabilitation (Macmillan 2017). In addition to treatment preparation, it aims to shorten recovery time, reduce peri-operative complications and improve compliance with non-surgical treatments (Moore et al. 2020) There is also evidence that prehabilitation can downstage tumours.

Prehabilitation not only reduces the negative impact of treatment, but also gives increased return on investment in conventional rehabilitation (Macmillan 2017). It can potentially reduce costs associated with providing extended rehabilitation, length of stay within the service and can improve patients’ satisfaction, quality of life and health outcomes. Recent evidence has shown a reduction in length of stay by 3 days.

Prehabilitation and rehabilitation services are already established in other parts of the country and improve patient experience and outcomes. Prehab4cancer in Greater Manchester has had a significant positive impact on patients' recovery and quality of life following cancer treatment. Evaluation of the Calderdale and Huddersfield NHS Foundation Trust cancer prehabilitation project demonstrated that patients who participate in prehabilitation interventions describe an improvement in quality of life and experience; they feel better equipped with information and support, leading to improvements in their physical and emotional wellbeing. Harrogate and District NHS Foundation Trust established "Active Against Cancer" in July 2019. It offers one-to-one consultations and bespoke activity programmes delivered by specialist trainers qualified to provide exercise sessions before, during and after cancer treatment. This is the model on which Fit for Life is based on, with a holistic focus on prehabilitation, maintenance during treatment, rehabilitation and then lifelong activity. Active Against Cancer has proved very successful; out of 73% of cancer diagnoses, 67.6% of patients accessed the service with positive results.

Prehabilitation/rehabilitation programmes can help to improve survival and reduce cancer deaths. Receiving care that is tailored to a person's needs can have a significant positive impact on their experience and quality of life following diagnosis and treatment. Prehabilitation provides such an opportunity.

Currently, ESNEFT is providing both a digital and a face-to-face pathway of prehabilitation/rehabilitation services, offering choice and equity across all oncological patients. However, a report around the efficacy of the service will provide robust results and conclusions around the actual efficacy of the intervention for the patients ESNEFT serves. In scoping this project the centre worked collaboratively with Active Suffolk and Essex, East Suffolk Cancer Commissioning group and former and current service users.

Prehabilitation model

Current evidence suggests that a multi-modal approach is the most effective and yields the best outcomes for patients and organisations, with the key interventions being robust assessment of nutritional and psychological needs as well as physical function. This is followed by referral as appropriate to dietetic services, counselling and bespoke exercise programmes.

A prehab model consisted of three different stages:

1.Pre-assessment

Used to measure the patients' baseline, identify risk factors, inform the patient and make joint decisions and to establish the interventions required to support patients so they achieve the maximum benefit from interventions associated with prehabilitation. It also contributes to

individual level data on the outcomes of prehabilitation, which can ultimately add to the wider evidence base supporting prehabilitation.

2. Prehabilitation interventions

There are a range of interventions that make up prehabilitation. Physical Activity is always present, Dietary Support and Psychological Wellbeing are often present whilst other interventions are seen less frequently

3. Follow-up post-treatment

This is the rehabilitation stage following treatment.

The Fit for Life programme broadly adopts this model and provides an individualised approach; specific needs are addressed, and referrals can also be made to services such as smoking cessation, weight management, counselling and support groups to ensure that the individual has the right support at the right time to make healthy lifestyle choices.

How was the project promoted and in which sites?

To recruit patients, the project was promoted at both Ipswich and Colchester hospitals through a variety of means, principally:

- Cancer Nurse Specialists were briefed on the programme and encouraged to refer appropriate patients through to the Cancer Wellbeing and Information centres at Ipswich and Colchester
- Patients could sign up via the centre website; centre staff would then contact patients and begin the referral process
- Patients drop in at the Information Centres

Methodology followed for patients to be involved in.

Inclusion and exclusion criteria are identified below. Once patients were identified as appropriate for referral, a referral form (see example below) was sent to the appropriate provider of the exercise classes; initial telephone contact was then made with the patient to discuss the programme and answer any questions. PAR-Q and risk screening was undertaken and patients commenced classes once approved.

Patient pathway

Approx. 12-16 weeks total pathway with flexibility according to patient need

Patients could also entered directly into the Rehabilitation phase of the programme.

Any patients included/excluded in the study?

Patients of Grade 0-2 of ECOG Performance Status were eligible for the programme. Inclusion and Exclusion Criteria are detailed below. Patients considered as High Risk on The Irwin and Morgan Risk Stratification Tool were also excluded.

Inclusion Criteria:

Clinical diagnosis of cancer

Patient is at one of the following stages:

Pre-treatment

Undergoing treatment

Post-treatment

Patient has been consented and is motivated to attend exercise sessions

Independently mobile with/without walking aid

Exclusion Criteria:

X Patient did not fit within the inclusion criteria stated above.

X Patient was under the age of 18 years.

X Patients presented unhealed surgical wounds.

X Resting systolic blood pressure \geq 180mmHg and/or diastolic blood pressure \geq 100mmHg.

X New or uncontrolled arrhythmias.

X Uncontrolled resting tachycardia \geq 100bpm.

X A recent (within last 6 months) significant change in a resting ECG

X Unstable/acute heart failure.

X Any other unstable cardiovascular conditions i.e. unstable angina, Acute Left Ventricular Failure, uncontrolled hypertension, recent MI or other acute cardiac event, Aortic stenosis

X Unstable diabetes.

X Acute/uncontrolled psychiatric illness.

X Symptomatic hypotension/patient experiences significant drop in BP with exercise.

X Experiences pain, dizziness or excessive breathlessness during exertion.

X Febrile illness.

X Active foot problem, e.g. ulceration.

X Established cerebro-vascular disease.

X Any unstable/uncontrolled condition.

X Currently Neutropenic

X Moderate to severe cognitive impairment that would require 1:1 support during exercise

X Unmanaged pathological fractures

X Patient has any other comorbidities outside scope of practice of L3 Exercise Referral / Level 4 Cancer Rehab exercise instructors

Objectives

Prehabilitation cancer services are essential for improving the resilience and outcomes of patients undergoing cancer treatment. By addressing physical, mental, and nutritional health early, these services lay the foundation for better overall treatment success. Studies, reviews and meta-analytic studies have shown several benefits for patients in both physical and psychological health and speed of recovery. These include, reduced inflammatory states and improved organ function along with important psychological improvements (i.e. better mood, improved levels of distress, depression, anxiety, reduced fatigue, etc.) (Faithfull et al., 2019; Treanor et al., 2018; Wabe-McBane et al., 2023).

Consequently, current evaluation aimed to assess important mental, psychological and physical metrics to measure the outcomes of the “Fit for Life” intervention along with its longer-term effects, within a year after the beginning of the prehabilitation phase of participation in the intervention.

Methodology

Evaluation goal

- The goal of the current project was to assess the effectiveness of the “Fit for Life” during a full year of participation for each patient. This included baseline and repeated measures every two -to three- months (depending on the patients’ needs and availability) for each participant of the evaluation survey.

The programme was designed to help patients prepare, cope better with their decided treatment and improve their recovery outcomes, health and quality of life, before, during and after the end of treatment.

- Following their registration on the programme, patients received a link to an initial online workshop (a set of pre-recorded videos so they could go at their own pace), covering the importance of physical activity, nutrition, emotional wellbeing and services available to help. These were followed by structured (face-to-face) exercise classes that take place both before and after treatment to assist patients’ recovery.

Participants Information Package

Participants were invited to the evaluation project via a brochure that included the following document:

Participant Information Form

Study Title: An evaluation of the effectiveness of a prehabilitation and rehabilitation pilot programme of cancer patients

Research Lead: Dr Emmanouil (Manos) Georgiadis

You are invited to take part in a study evaluating the effectiveness of a prehabilitation and rehabilitation pilot programme on the recovery of individuals with colorectal cancer.

This Participant Information Form will help you decide if you would like to take part. It sets out why we are doing the study, what your participation would involve, what the benefits and risks to you might be, and what would happen after the study ends. I will go through this information with you and answer any questions you may have. You do not have to decide today whether or not you will participate in

this study. If you agree to take part in this study, you will be asked to sign the Informed Consent Form. You will be given a copy of both the Participant Information Form and the Informed Consent Form to keep. Please make sure you have read and understood all the pages of the Participant Information Form.

1. What is the purpose of the study?

The purpose of this study is to evaluate the effectiveness of a prehabilitation and rehabilitation pilot programme ('Fit For Life') and its impact on the recovery of individuals with colorectal cancer.

2. What will my participation in the study involve?

Your participation will involve completion of a questionnaire and a chair sit to stand test. The questionnaire and sit to stand test will be completed at baseline i.e. just before the prehabilitation programme commences, and then again at 3 months, 6 months, 9 months and 12 months after the baseline. The questionnaire will take approximately 20 minutes to complete. The sit to stand test is a simple measure of lower body muscular strength and endurance. You will be asked to stand from a seated position on a chair, and to repeat this as many times as you can within 30 seconds. You will record the number of full sit to stands you complete within the 30 seconds.

All your responses and test results will be anonymised, and your identity won't be revealed at any point of data transfer, results analysis and published conclusions of this evaluation study.

3. What are the possible benefits and risks of this study?

Although this evaluation study does not provide any specific benefits to individuals taking part, the information we gain will help our understanding of prehabilitation and rehabilitation programmes. By taking part you will be contributing to research in the field of cancer prehabilitation and rehabilitation and helping to establish the effectiveness of this pilot programme. The possible benefits of this study are that this research will begin to build an understanding of how a prehabilitation and rehabilitation pilot programme can impact the recovery of people with a diagnosis of colorectal cancer. You will also be helping to inform the improvement and development of the programme. If significant benefits are shown through the outcomes of the evaluation then there is the potential for the programme to be implemented for other cancer patients.

Whilst we do not anticipate that you will experience any distress in completing the questionnaires, you will be aware that answering questions regarding your psychological and physical wellbeing can be

an emotional process. If you feel the need, please refer to the specialist personnel providing the prehabilitation/rehabilitation program for psychological support and available services.

The risks of taking part in the 30 second chair sit to stand test are low. You may feel slightly warm and out of breath, with possible soreness in your muscles and joints. There exists the remote possibility during a functional physical activity test such as the 30 second chair sit to stand test of adverse changes including, but not limited to, abnormal blood pressure, fainting, dizziness and localised muscle pain.

There are no risks or disadvantages to withdrawing your consent at any time.

4. Who pays for this study?

This study is funded by the John le Vay Cancer Support and Information Centre and staff time from the University of Suffolk.

5. What if I feel uncomfortable with an aspect of the study?

If you feel uncomfortable with any aspect of the study, you have the right to withdraw your participation at any point. All data you may have provided to this evaluation study up to that point will be removed and disposed to maintain confidentiality and anonymity. Should you like more information about the ways data confidentiality and data protection are retained during the current study, all researchers are available for questions on data collection and analysis procedures.

6. What if I don't want to answer a question being asked of me?

If you do not want to answer a question in any of the questionnaires, then the question can be skipped. Equally if you do not wish to participate in the chair sit to stand test, then you can decline to do this.

7. What are my rights?

Apart from the previously mentioned rights to withdraw yourself from the study at any point, you also have the right to information about the study and its purpose and this will allow you to provide informed consent before you take part in the study. You have a right to not be harmed or distressed, physically or psychologically, therefore if you feel uncomfortable or distressed about any aspect of the study, you have a right to withdraw your participation. You also have a right to be debriefed after the study which researchers will provide after the research has concluded.

8. What happens if I change my mind?

You can withdraw your information at any time during the study or after you have participated in the study. This means that, if you change your mind, you have a right to withdraw your participation and data from the study. Should you decide this, no information or data that has been given by you will be used in the study.

9. What happens after the study?

After you have finished the questionnaires and sit to stand test and you are still happy for your answers and information to be used in the study, your answers will be transcribed on to an anonymized excel data spreadsheet, which contains only your participant number. All results will be incorporated into an evaluation study which will be sent to the East Suffolk and North Essex NHS Foundation Trust. They will share this amongst other organisations including Clinical Commissioning Groups. We can send you a summary of those results so you can see how your participation has helped our research. The findings of the evaluation will also be written up for submission to academic journals with a view to publishing the outcomes in the academic literature. The answers and information you have provided will be kept in a password protected cloud file -on average- up to 5 years, depending on requests from any journals the research may be submitted to.

10. Who do I contact for more information if I have concerns?

If you have any concerns about the study or simply would like more information about how your data and information will be used, you can email the lead of this evaluation study Dr Emmanouil (Manos) Georgiadis at M.Georgiadis@uos.ac.uk.

11. How will my data be stored and for how long?

To conform with GDPR guidelines, all data will be stored in a secure password protected Cloud file and will be stored for 5 years depending on any journal requirements that research may be submitted to for publication. All data will be kept anonymous and confidential and will not be connected to you personally. Your personal details will not be entered on any data sheets. Confidentiality of the material will be maintained by using a unique identifying number, which will be allocated to each of you participating in the study. Data will be stored on an encrypted file and hard copies of data will be held in a locked cabinet to which only the researchers will have access. The data will be held for five years.

Informed Consent Form

Study Title: An evaluation of the effectiveness of a prehabilitation and rehabilitation pilot programme for colorectal cancer patients

Research Lead: Dr Manos Georgiadis, University of Suffolk

I confirm that I have read and understand the information sheet/letter explaining the above research project and I have had the opportunity to ask questions about the project.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences.

I understand that my responses will be anonymised and any personal or identifying information removed from published materials

I give permission for members of the research team to have access to my anonymised responses.

I understand that my name will not be linked with the research materials, and I will not be identified or identifiable in the

report, reports, or any research publications that result from the research.

I understand the risks associated with the physical activity testing (30 seconds chair sit to stand test), including the risk of bodily injury.

I understand that the data I provide will be used solely for the purposes of the research study outlined and will not be used for any other purpose. I also understand how long my data will be stored for.

I agree to take part in the above research project.

Name of Participant

Date

Signature

(or legal representative)

Name of person taking consent*

Date

Signature

(if different from lead researcher)

To be signed and dated in presence of the participant

Researcher*

Date

Signature

To be signed and dated in presence of the participant

**Delete as appropriate*

Copies:

Once this form has been signed by all parties the participant should receive a copy of the signed and dated participant consent form, the letter/information sheet and any other written information provided to the participants.

A copy of the signed and dated consent form will be kept in a secure location.

Evaluation included the following components:

Perceived levels of anxiety, depression, hope for the future, fatigue, and quality of life. Body weight related information during the current and the previous period. Physical activity, sedentary behaviour and lower limbs physical strength. Selection of the tools used in the current evaluation report was based on the following criteria,

1. A reduced number of items (questions) for patients to respond, to minimise patient burden

Each questionnaire was treated as an important source of information with the potential to reveal the effects of the prehabilitation program “Fit for Life”. However, due to the variety of the required information, each questionnaire was chosen based on the number of its items as well.

2. Prior usage of tests/questionnaires in oncology scientific literature

Selected tests and questionnaires have been created targeting the needs of oncological patients or have been used before in oncological related research projects.

3. Already published validation properties for each test/questionnaire

Every questionnaire and evaluation test used in the current survey has shown acceptable psychometric properties and test-retest validity and reliability.

In more detail, the questionnaires and measurement used in the current evaluation study were:

The Hospital Anxiety and Depression Scale (HADS) - 14 items measuring Anxiety and Depression

HADS is a questionnaire assessing depression and anxiety in non-psychiatric patients. It provides two distinct scores of depression and anxiety through 14 items (short questions) with various studies showing reliable and valid results. In more detail, HADS performs well in screening for the two separate scales in non-psychiatric hospital populations and the general population. Additionally, it shows evidence of equal abilities to identify anxiety and depression disorders similarly to clinical questionnaires (Bjelland et al., 2002).

The Piper Fatigue Scale-12 (PFS-12) - 12 items measuring behavioural, affective, sensory and cognitive fatigue

Cancer-related fatigue is usually linked to perception of unusual tiredness with varied severity affecting the functional ability of cancer survivors. The 12-items Piper Fatigue Scale has been shown very good psychometric results based on several criteria that include reliability, validity, literacy levels, and response bias (i.e. in various cultures). Overall, the PFS-12 covers different aspects of the fatigue experience and has been frequently suggested in the research literature to be free measurement burdens (Reeve, et al., 2012).

The MUST - Malnutrition Universal Screening Tool (though discussion needed here regarding this or Eating Wellbeing Check)

Oncology patients are at high risk of malnutrition due to both the clinical effects of the disease and the consequences of the required treatment. MUST screening tool has been found a reliable scale to identify successfully oncology patients at the risk of malnutrition (Ferguson et al., 1999). Even if we haven't used it as a screening test to curve malnutrition at an individual level, we have used the scale to repetitive assess patients scores (and any variations of those scores) over 12

months. It is a reliable tool used extensively in NHS settings including the Ipswich and Colchester Hospitals.

The Integrative Hope Scale (IHS) 23 items measuring 'trust and confidence', 'positive future orientation', 'social relations and personal value' and 'lack of perspective.

Hope has been identified as a key dimension integral to personal appreciation of wellbeing and optimism. It relates to previous experiences, future references of aspiration, important goals in life, inner strength, personal motivation, contextual factors, human relationships, spirituality, sense of meaning in life, and perceived accomplishments in daily living. For those reasons, it has got central role in psychology, psychotherapy and psychiatry with clinical populations being also a priority population when hope is required and evaluated (Bluvol & Ford-Gilboe, 2004).

The IHS scale showed provides acceptable psychometric properties provide and good evidence for reliability, validity, stable factor structure and concurrent and external validity (Schrack, et al., 2010). The four subscales of the questionnaire (trust and confidence, Lack of perspective, positive future orientation, social relations and positive value) are stable and well supported making this short questionnaire appropriate and relevant to the evaluation study.

The RAND 36-Item Short Form Health Survey (SF-36) 36 items assessing Physical functioning, Physical health, Emotional problems, Energy/ fatigue, Emotional well-being, Social functioning, Pain, and General health

Health-related quality of life (HRQoL) describes the way health impacts an individual's ability to function and relates to her/his perceived physical, mental and social levels of well-being in life. Functioning components (relatively objective measurements of well-being) relate to areas of self-care, occupational and house related activities. However, the well-being components of every measure of HRQoL are considered more subjective and internal to the responder as they include areas such as, happiness, sadness, depressive symptoms, anxiety and pain. Hence, a comprehensive measure of HRQoL includes mental, physical and social components.

The SF-36 questionnaire with its subscales has been evaluated and showed appropriate psychometric values across different populations. It provides measurements of physical and mental components of quality of life (2 scores), but also 8 separate subscales (Physical functioning, Physical health, Emotional problems, Energy/ fatigue, Emotional well-being, Social functioning, Pain, and General health). It has been used in various languages and provides valid and reliable scores repetitively (Hays & Morales, 2001). Hence, it was considered ideal for the needs of the current evaluation.

The International Physical Activity Questionnaire IPAQ - short - Self-reported Physical Activity: 7 items measuring PA and sedentary behaviours

Physical Activity (PA) and Sedentary Behaviours (SD) have attracted enormous attention during the last 25 years as they are highly correlated with health-related indices (WHO, 2025). One of the biggest challenges in measurement of PA and SD is the validity of their reported amounts as they tend to be a subject of social desirability (i.e. provide an ideal version of self), and memory biases. When accelerometers (that are considered the golden standard of field assessment of PA and SB) are not possible to use due to cost and limited resources, there is a need to choose a questionnaire with the utmost value in terms of psychometric properties (Freedson & Miller, 2000).

One of the PA and SB questionnaires that provides relatively stable scores in terms of test-retest reliability and validity in comparison to accelerometers but also it is short in items and completion time is the IPAQ-short. These characteristics made it an ideal scale for feasibility, resources and duration purposes during the current evaluation study (Lee et al. 2011).

The 30 second sit to stand test (30CST) Assesses functional leg strength and dynamic stability – number of full stands a patient can complete from sitting on a chair, in 30 seconds.

Lower extremity muscle ability and strength is highly important for preventing physical frailty, disability and dependency in later years but also in clinical populations. As it is highly significant to maintain lower body strength when undergoing a highly toxic medical treatment such as the one oncology patients are going through, it is important to evaluate this health component using the best available tool.

The 30CST test has shown repetitively one of the best test-retest reliability and validity test as it provides consistent and coherent measures of lower body strength in various populations in need. Related studies have shown that the 30CST measurement has one of the best discrimination power levels in relation to age and physical activity levels, categorising individuals in an effective way (Jones et al., 1999). Additionally, the 30CST test can be administered online and via a video call making it ideal and a highly effective tool for the needs of the current evaluation study (Bowman et al., 2023).

Results:

Descriptives and Demographics

Participants:

Participants reported two genders with females being slightly outnumbered by males during baseline (Males=94; Females=87). This means that 52% of participants were male and 48% females.

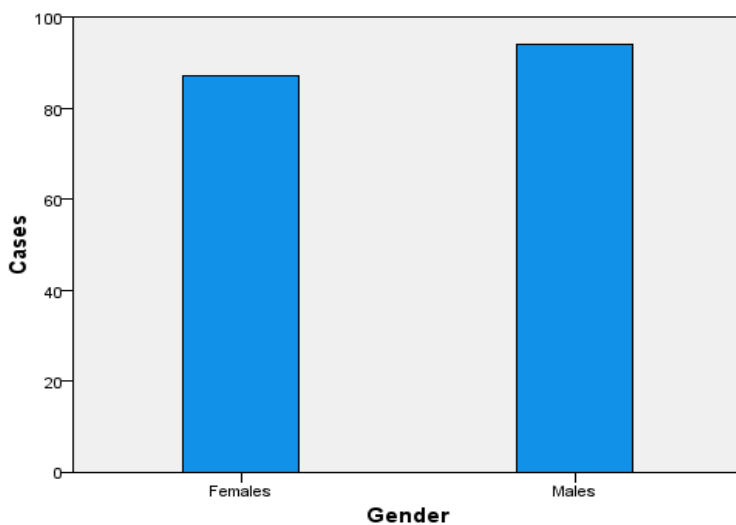


Figure 1. Participant's reported gender

Age of participants was quite variable. The following graph shows the cases per age group:

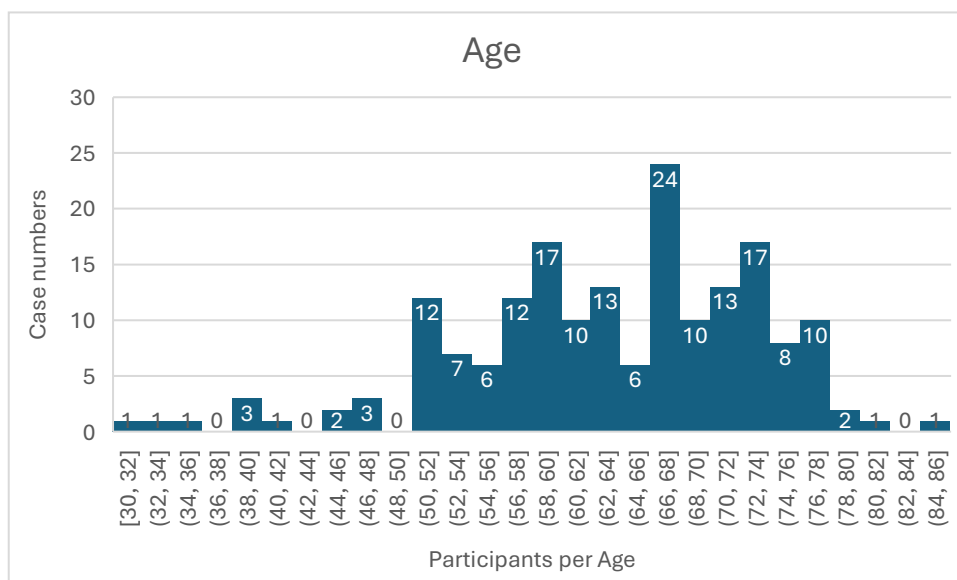


Figure 2. Age (per N) of participants

A series of repeated Anova tests were conducted to examine whether participants' responses were influenced by the prehabilitation intervention. Unfortunately, participants' numbers were significantly dropped from one data collection to the next (Baseline → 1st Data collection → 2nd Data collection → 3rd Data collection → 4th Data collection). This resulted in less power than required to assess the expected effects the service had on participants. In more detail, participant numbers per data collection were as follows (participants' numbers vary in each phase according to the examined variable):

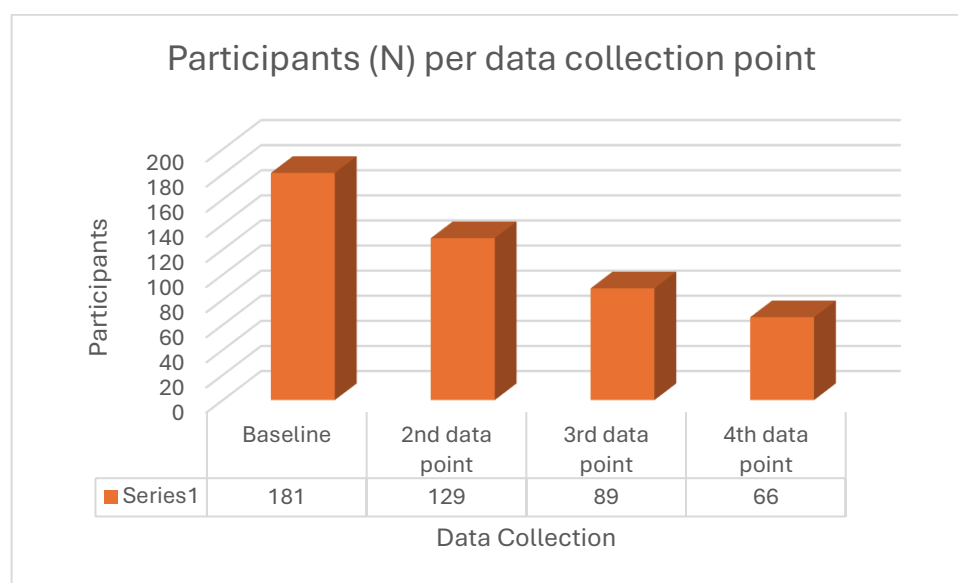


Figure 3. Number of participants per data collection point

Power needed based on intended statistical analyses

Unfortunately, this reduced participation rate in each of the data collection points did not allow enough statistical power to evaluate the assessed intervention fully. In more detail, the required power (based on G*Power software) in each of the assessment data collection points needs to be not less than $N=90$ for the needs of the evaluation processes (see Figure 4)

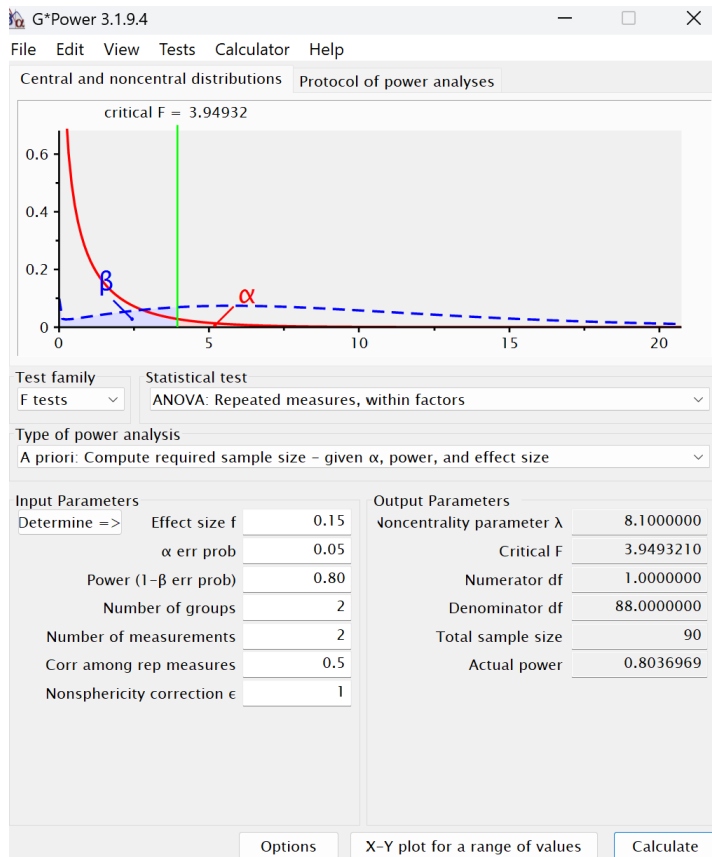


Figure 4. Needed power for the assessment needs of the current evaluation (based on G*Power)

Anxiety Measurement Effects (HADS questionnaire)

(lower score signifies an improved result)

A repeated measures ANOVA was conducted to examine the effect of the Fit for Life intervention to participants' anxiety levels. Apart from the 2nd data collection, the third data collection provided clues about the positive effects of the prehabilitation program.

Mauchly's test indicated that the assumption of sphericity was retained ($\chi^2(2) = .000$, $p = .1.000$). The analysis revealed a significant main effect of time $F(1,65) = 4.74$, $p < .033$, indicating changes in anxiety levels for the participants of the intervention during the first 4-5 months of the intervention. Post-hoc comparisons showed that the participants experienced a significant reduction in anxiety ($M = 6.076$; $SD = .486$) from their baseline levels ($M = 7.33$; $SD = .517$) ($p < .033$; $\eta^2_p = .068$) (Figure 5).

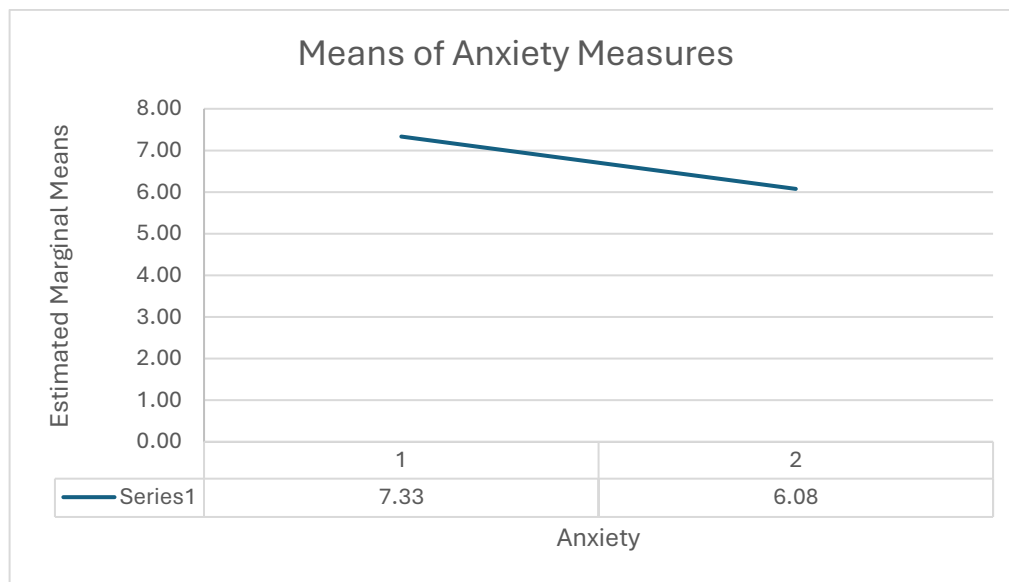


Figure 5. Difference between the baseline (1) and the 3rd data collection (2) of anxiety in the participants' sample (N=66) (the lower mean suggests an improved score)

Depression measurement effects (HADS questionnaire)

(lower score signifies an improved result)

The same trend (between the baseline and the 2nd measurement) and result was revealed for participants' depression scores that were reduced from the baseline to the third data collection. In more detail, a repeated measures ANOVA was conducted to examine the effect of the Fit for Life intervention to participants' depression levels. The third measurement provided clues about the positive effects of the prehabilitation program. However, the scores' difference failed to reach statistical significance.

Mauchly's test indicated that the assumption of sphericity was retained ($\chi^2(2) = .000$, $p = .1.000$). The analysis revealed a non-significant main effect of time $F(1,58) = 0.34$, $p < .855$, indicating that the reduction of depression levels for the participants of the intervention during the first 4-5 months of the intervention did not reach the level of statistical significance. Post-hoc comparisons showed that the participants experienced a non-significant reduction in depression ($M = 4.881$; $SD = .497$) from their baseline levels ($M = 5.00$; $SD = .506$) ($p = .855$; $\eta^2_p = .001$). Please see following Figure 6 for a schematic representation of the depression scores between baseline and the 3rd data collection points. The inability to find statistically significant changes in depression scores of the prehabilitation intervention can be attributed to the reduced power of the evaluation assessment (Figure 4)

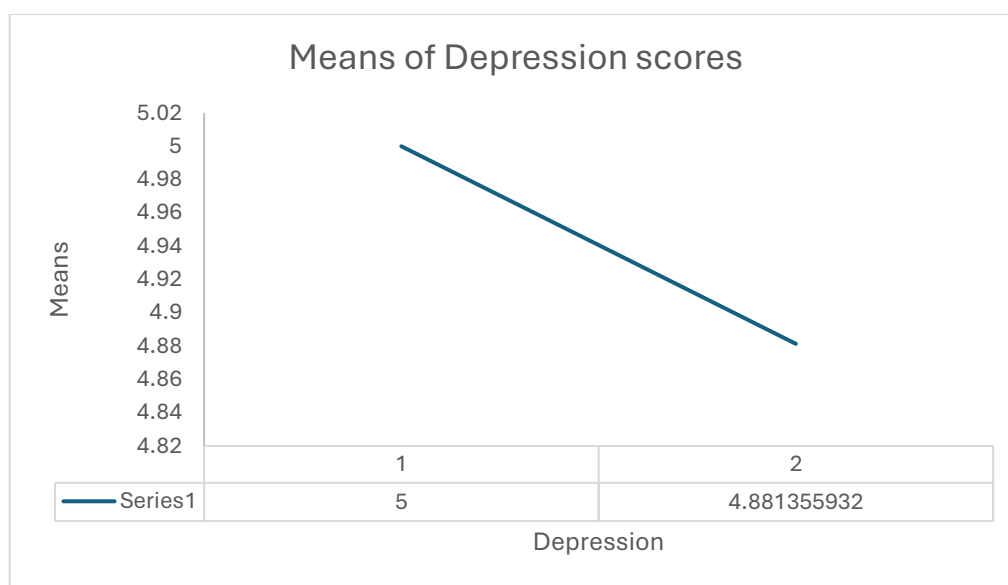


Figure 6. Difference between the baseline (1) and the 3rd measurement (2) of depression in the participants' sample (N=59) (the lower mean suggests an improved score)

Emotional issues restricting HRQoL indices

(higher score signifies an improved result)

A repeated measures ANOVA was conducted to examine the effect of the Fit for Life intervention to participants' perceived emotional issues limiting their quality of life. With the exception of the 2nd measurement, the third measurement provided clues about the positive effects of the prehabilitation program.

Mauchly's test indicated that the assumption of sphericity was retained ($\chi^2(2) = .000$, $p = .1.000$). The analysis revealed a significant main effect of time $F(1,78) = 10.66$, $p < .002$, indicating reductions to factors influencing their perceived energy levels. Hence, the intervention had a positive effect on participants of the intervention during the first 4-5 months of the intervention. Post-hoc comparisons showed that the participants experienced a significant reduction in any emotional issues restricting the quality of life of participants ($M = 61.851$; $SD = 2.626$) from their baseline levels ($M = 52.848$; $SD = 2.480$) ($p < .002$; $\eta^2_p = .120$) (the higher the score, the better the result).

Below you may find the graphic representation of the mean differences for the emotional issues restricting HRQoL (Figure 8).

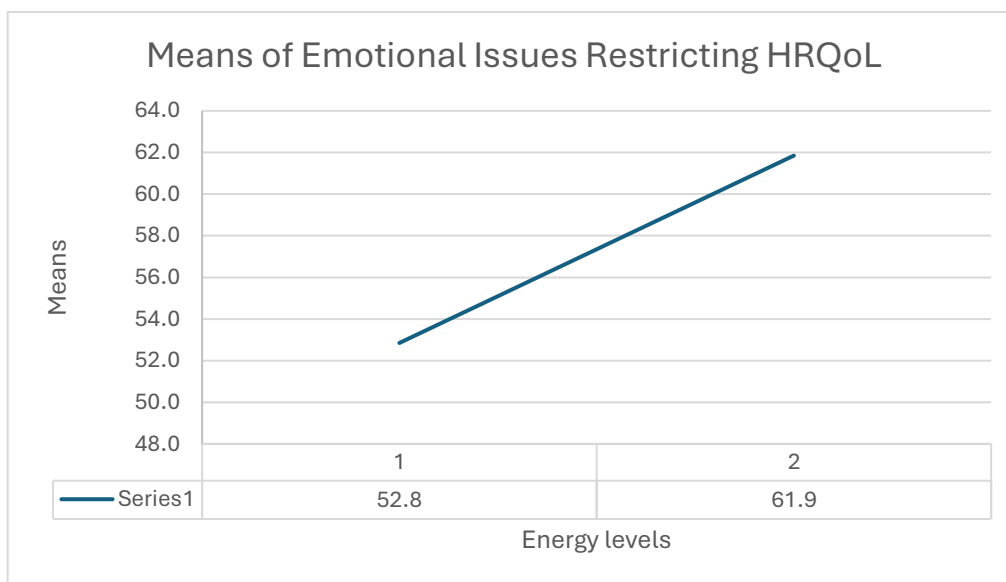


Figure 8. Difference between the baseline (1) and the 3rd measurement (2) of emotional Issues restricting participants' HRQoL (N=79) (the higher mean suggests an improved score)

Sit to Stand Test

(higher score signifies an improved result)

Participants showed an improvement in their lower extremity muscle ability and strength scores as measured by 30CST test. In the particular test participants showed improvements from the 1st measurement after baseline and this was the only measurement showing such a trend.

More specifically, a repeated measures ANOVA was conducted to examine the effect of the Fit for Life intervention to participants' lower extremity muscle ability and strength. Both the 2nd measurement, and the 3rd measurement provided clues about the positive effects of the prehabilitation program.

Mauchly's test indicated that the assumption of sphericity was retained ($\chi^2(2) = 45.111, p = .001$). The analysis revealed a significant main effect of time $F(2,124) = 7.057, p < .001$, indicating improvements in lower extremity muscle ability and strength. Hence, the intervention had a positive effect on the participants' strength during the first 4-5 months of the intervention. Post-hoc comparisons showed that the participants experienced significant improvements in their leg strength from baseline to both the 2nd (2nd data collection point: $M = 16.57$; $SD = .774$) and the 3rd data collection points (3rd data collection point: $M = 16.81$; $SD = .673$) in comparison to their baseline (initial) levels ($M = 14.03$; $SD = .683$) ($p < .002$; $\eta^2_p = .139$) (the higher the score, the better the result).

Below is the graphic representation of the mean differences for the 30CST test (Figure 9).

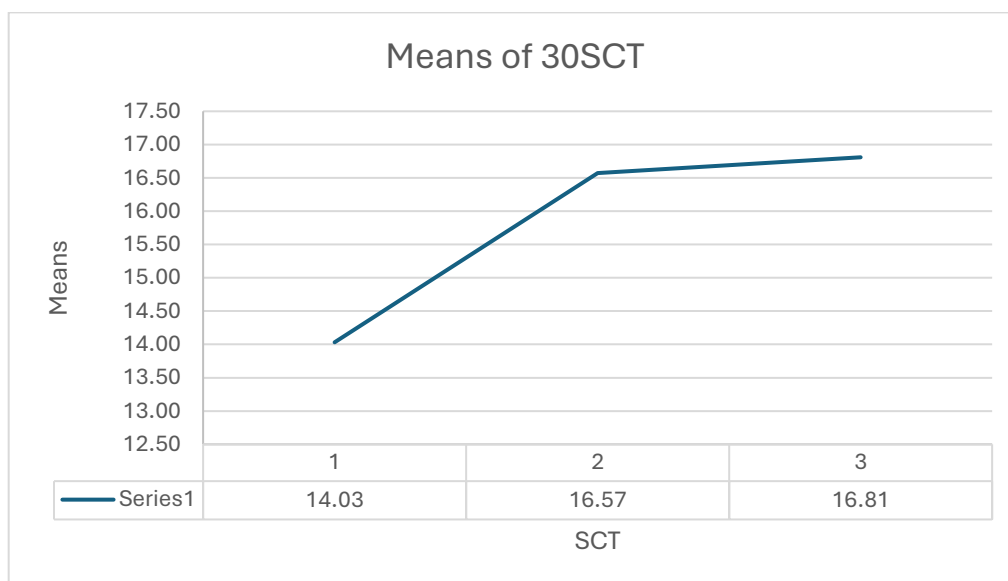


Figure 9. Difference among the baseline (1), the 2nd (2) and the 3rd (3) measurements of Sit to Stand based on the participants' scores (N=63) (the higher mean suggests an improved score)

Eating behaviour

To evaluate responses signifying differences between baseline and next data collection points in eating behaviours and their outcomes, a non-parametric test was performed including the metrics assessed through the use of all three components of the questionnaire. One metric that showed improvements was the degree of unintentional or unplanned weight loss in the last 3 months.

More specifically, a Friedman test was conducted to compare scores of unintended weight loss from baseline to the third data collection points. The test indicated a statistically significant difference between conditions, $\chi^2(2) = 6.373$, $p < .041$. Post-hoc pairwise comparisons using Bonferroni correction revealed no significant statistical differences among conditions. This result could be attributed to the reduced number of participants of the current evaluation.

Below are the mean scores for each data collection phase are displayed along with their cases (Figures 10, 11, & 12).

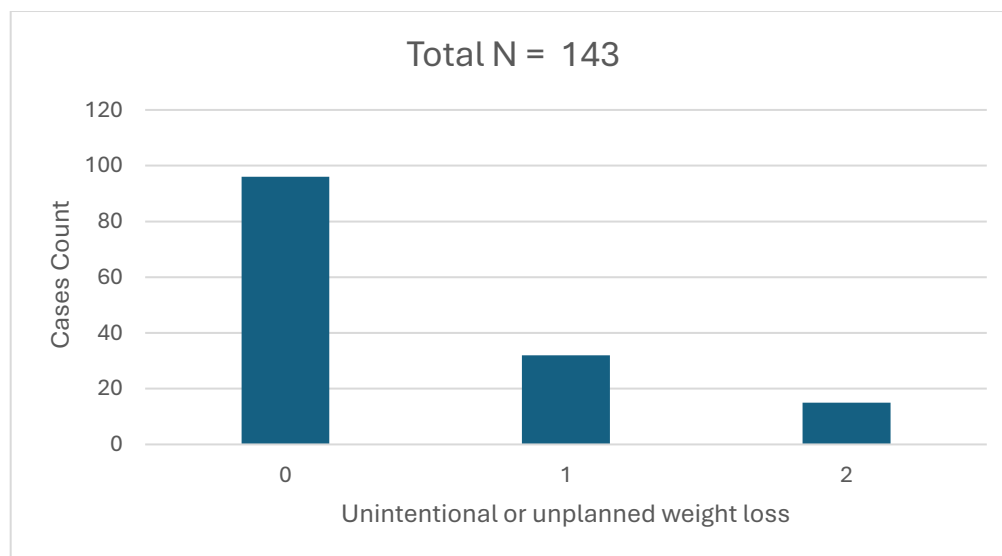


Figure 10. Unintentional or unplanned weight loss case count during baseline data collection (0 represents the best score, where 0 is “no weight loss”, 1 is “some weight loss” and 2 is “more than one stone of weight loss”)

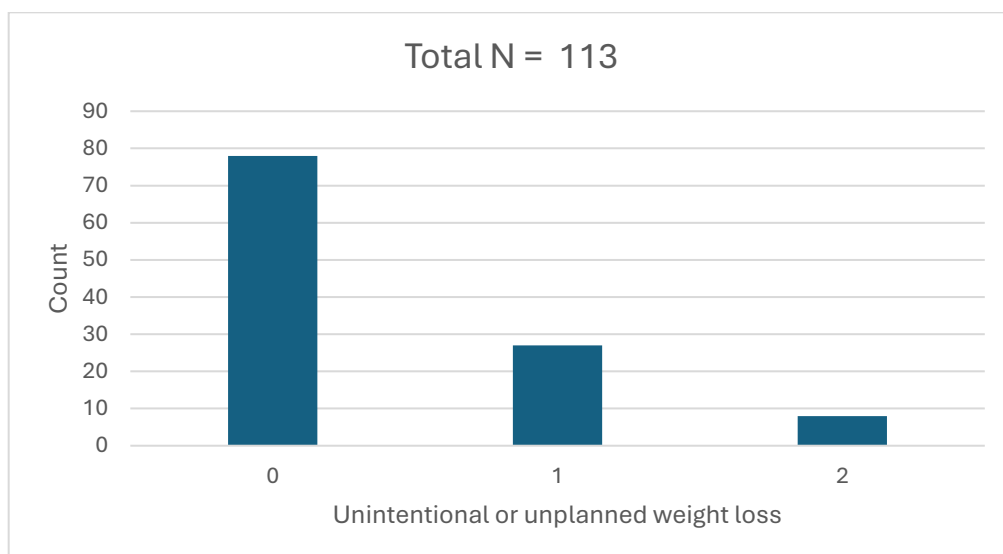


Figure 11. Unintentional or unplanned weight loss case count during the 2nd data collection (0 represents the best score, where 0 is “no weight loss”, 1 is “some weight loss” and 2 is “more than one stone of weight loss”)

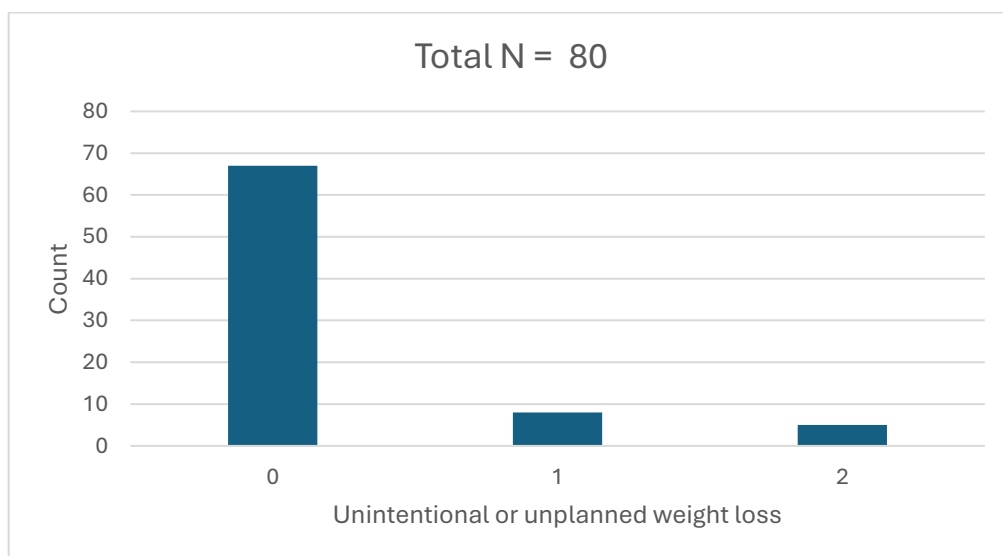


Figure 12. Unintentional or unplanned weight loss case count during the 3rd data collection (0 represents the best score, where 0 is “no weight loss”, 1 is “some weight loss” and 2 is “more than one stone of weight loss”)

BMI scores

BMI scores revealed a reduction trend comparing the baseline to the 3rd data collection point of the participants' responses. In more detail, a repeated measures ANOVA was conducted to examine the effect of the Fit for Life intervention to participants' BMI scores. With the exception of the 2nd measurement, the third measurement provided clues about the reduction of BMI scores of the prehabilitation program.

Mauchly's test indicated that the assumption of sphericity was retained ($\chi^2(2) = .000$, $p = .1.000$). The analysis revealed a significant main effect of time $F(1,67) = 5.882$, $p < .018$, indicating reductions to BMI scores of the participants. Even though, the intervention suggested a significant effect on the participants' BMI, it cannot be estimated whether it is a positive or negative effect on its participants as it depends largely on the individual needs of each patient (i.e. loss of fat mass). Post-hoc comparisons showed that participants experienced a significant reduction in their BMI scores ($M = 26.18$; $SD = .664$) from their baseline levels ($M = 27.78$; $SD = .765$) ($p < .018$; $\eta^2_p = .081$)

Here is the graphic representation of the mean differences for participants' BMI scores:

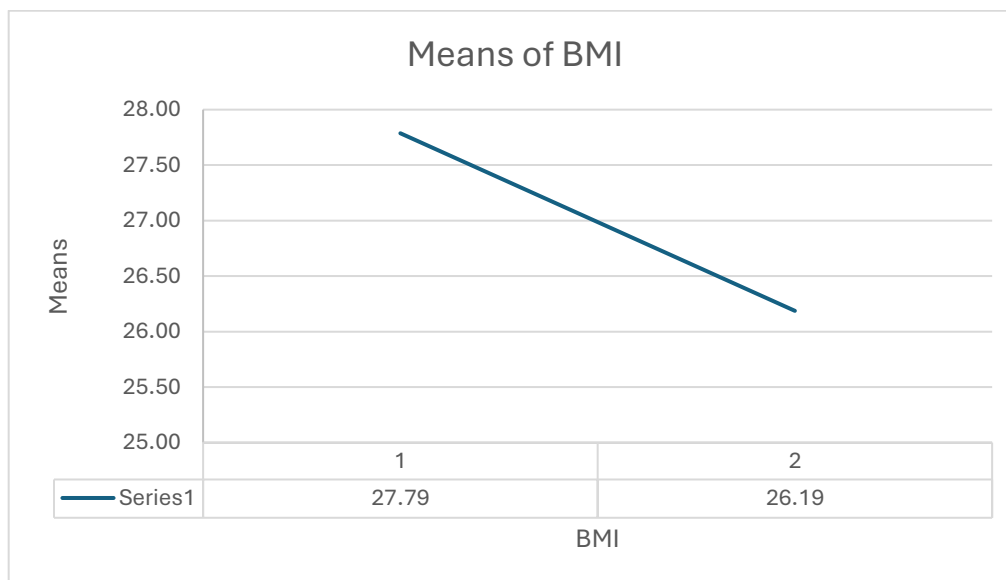


Figure 13. Difference between the baseline (1) and the 3rd measurement (2) of the participants' BMI scores (N=68) (the lower mean suggests an improved score)

No other variables showed significant differences between baseline and any of the following data collection points for the participants of this evaluation study.

Qualitative data

(feedback from patients)

Apart from the tests/questionnaires collected by the kind contribution of participating patients and the staff at the ESNEFT support centres, patients taking part in the prehabilitation/rehabilitation program provided written feedback based on their experiences during the intervention. Although mainly focused on the exercise classes, there are important points to emphasise related to the overall experience of referral and participation in the “Fit for Life” program.

The main areas of feedback are:

- Participants praised the prehabilitation/rehabilitation program and the weekly support sessions as an important, positive and totally recommended experience for every patient needing similar support.
- Patients commended on the physical improvement they experienced as a result of their participation in the program allowing them to either improve their physical condition prior and after the oncological intervention, or to accelerate their rehabilitation during the intervention due to their participation in the weekly exercise sessions.
- Patients also felt great support on their mental health as they experienced emotional stability and encouragement to reengage with their daily endeavours.
- Through the social element of the sessions, participants were able to mingle with other individuals, feeling again part of the wider community.
- The exercise leader and the rest of the program staff have been greatly encouraging and supportive, making the whole experience not only pleasant but also engaging and accommodating each patient’s personal needs.

Overall, feedback points from patients suggested that participation in the “Fit for Life” program has been a positive and greatly appreciated experience, with every participant commending and advocating the program to other users in need (see Appendix).

Discussion

The attempted evaluation has been ambitious in its design and format, assessing the effectiveness of a prehabilitation/rehabilitation program for oncological patients. Seven psychometrically valid, specialised and world widely used questionnaires/tests [the Hospital Anxiety and Depression Scale (HADS), the Piper Fatigue Scale-12 (PFS-12)], the MUST Malnutrition Universal Screening Tool, the International Physical Activity Questionnaire IPAQ – short, the Integrative Hope Scale (IHS), the RAND 36-Item Short Form Health Survey (SF-36), and the 30 second sit to stand test (30CST)] were utilised with the aim to collect accurate responses regarding the effectiveness of the program under evaluation.

Unfortunately, various issues with the participating patients (i.e. having to provide responses over a year and during their prehabilitation/rehabilitation journey) and data collection processes prevented the extraction of robust results for various areas of the intervention (i.e. perceived hope, overall HRQoL scores, physical activity and sedentary behaviours). This is due to reduced statistical power required for the appropriate assessment of critical metrics in this evaluation.

Overall, results support the effectiveness of the intervention. This is due to two main reasons.

The first one relates to the statistical significance several assessed variables could have reached. The example of depression scores that even if they presented an overall improvement in mean scores, they did not reach statistical significance thresholds in separate data collection points (via the General Linear calculations of repeated ANOVA), is suggestive of such trend in the data. This is an issue that could have been resolved by reaching the required statistical power (see results for more information).

The second reason relates to the significant statistical effects found related to this intervention. On the mental/psychological side, findings suggest the positive effects of the intervention on reported anxiety symptoms and perceived energy levels to accomplish daily tasks. Anxiety (and depressive) symptoms relate to the inability to perform daily personal routines and activities due to unknown and unfamiliar living circumstances. These are greatly significant for mental health in oncological patients, facing life-changing consequences and an uncertain future, where 1 in 3 experience anxiety and 1 in 4 face depression symptoms (Naser et al., 2021; Pitman et al., 2018).

However, it appears that the structure and multilevel nature of the intervention under assessment (exercise, nutritional and psychological support), can enhance those variables even when underpowered and lacking the required number of participants. Behavioural measurements as they are represented by other statistically significant scores (reduced emotional issues restricting HRQoL, eating behaviour improvements) suggest that participants

in the intervention felt supported to engage more in daily living. These are important variables for behavioural intentions of oncological patients, especially when supported by an enhanced control over body weight around the 3rd data collection point (approximately, 4 to 6 months after the start of the prehabilitation/rehabilitation program). It signifies a central factor of improved control over the lives of the oncological patients. This is in line with recent evidence suggesting that oncological patients are in increased need of behavioural guidelines and support (Mititelu, et al. 2024) with a well-designed plan required involving the patients and their families/carers for the most adaptive behavioural responses to occur and allow improvements in quality of life both throughout the therapy treatment and after its conclusion (Turchi et al., 2021).

On the physical level the improvement of participants' leg muscle strength, signifies another important finding. The significance of retaining muscle mass is critical for the positive prognosis of oncological patients as it helps to retain a healthy metabolic rate (Ligibel et al., 2022). Current oncological research supports the initiation of sophisticated muscle strengthening programs to help improve fatigue and retaining muscle mass (Bettariga et al., 2023). Overall, there is ample evidence that muscle strengthening exercises are significant for improving treatment prognosis and the current evaluation provides support for improving this important physical metric in the participants of the assessed intervention. This clearly signifies an important finding for the evaluation of this study.

There seems to be an increased need for patients' support during the intervention and the rehabilitation process (treatment phase) (Keen, et al., 2023). Analysed data provided clues regarding the patients' need for more resources and support. Prehabilitation/rehabilitation services need to take this information on board when designing required resources, frequency of support and meetings with the experts. This finding is in line with relevant literature supporting the significance of this phase, under the terms of "maintenance" and "restorative" rehabilitation for a successful oncological therapy/service provision (Humphreys, et al., 2024).

Finally, based on feedback received by participants, it is evident that patients adhering to the weekly exercise, nutrition and mental health sessions have been greatly benefiting from this participation. Patients reported important physical, mental, and social benefits from partaking in the "Fit for Life" program with every one commending on and endorsing the program to individuals in need of such prehabilitation/rehabilitation service for overcoming oncological related health issues.

The above information is deemed important for informing further developments and improvements in the Fit for Life program. Planning this type of targeted intervention for oncological patients requires synergy and collaboration of experts providing services on

exercise, nutrition and mental health with additional resources needed at every level of provision (Cancer Research UK, 2025). The results of this report support the effectiveness of the intervention program and call for maintaining this prehabilitation service to oncological patients in need. We also aspire that this report will contribute to policy improvements in the prehabilitation/rehabilitation services.

Results of this evaluation are in line with recent literature evidence. Based on meta-analytic data there is a clear support for the overall efficacy of prehabilitation interventions to reduce clinical complications, providing significant improvements in length of hospitalised stay, health related quality of life, and physical recovery for patients (McIsaac et al., 2025). This meta-analytic study provided also clues suggesting that evaluation studies around prehabilitation/rehabilitation services need to be "...appropriately powered for high priority outcomes and [...] a low risk of bias [are required] to have greater certainty in prehabilitation's efficacy" (McIsaac et al. 2025; p. 1).

Unfortunately, reduced statistical power impeded the extraction of robust and emphatic results based on statistical significance and effect size during the assessment of critical variables of effectiveness in the current evaluation study. This evaluation could greatly benefit from efficient mechanisms to recruit and engage an increased number of oncological patients, enhancing the statistical power of its attempted analyses.

Such a demand requires careful planning, resources and the adaptation of systems able to respond to complex patients' needs (i.e. age, deprivation, culture, transport) (Keen et al., 2023). However, it seems to be the only way to tackle the exclusion of patients from a service that shows effectiveness, reduction of health care costs, improved treatment responses, less therapy complications, better physical recovery and improved quality of life (McMillan Cancer Support, 2024). Equally, supporting lifestyle modifications and adaptations (i.e. more physical activity and increasing the consumption of protein) leading to improved treatment responses and enhanced physical and mental health outcomes, requires caring for individual differences and unique patients' characteristics that necessitate expertise and resources in place to meet such a demand (Keen et al., 2023).

We aspire that the results of the current evaluation study will help harmonising services and streamlining resources towards the expansion of the prehabilitation/rehabilitation service. Sample was not large enough to allow significant results in every examined metric. However, it provides evidence over its effectiveness and potential, supporting similar positive findings in the current literature, and calling for improvements in standardisation of services and policies.

Recommendations

- The current evaluation provided positive clues on the mental, behavioural and physical improvements of the participating oncological patients.
- There is a need to expand the recruitment of oncological patients in the prehabilitation/rehabilitation intervention, irrespectively of their individual characteristics and based on their complex needs (i.e. cultural background, age). The same request applies for the need to facilitate continuation of participation for patients in all rehabilitation phases.
- Results of this evaluation are in line with encouraging recommendations of the prehabilitation/rehabilitation literature, confirming the need to expand the provision of related services for reducing health care costs and treatment complications, while improving therapy responses, physical recovery and quality of life in oncological patients.

Conclusions

Results of this evaluation study support the remit and objectives of the prehabilitation/rehabilitation service. Important metrics for the mental and physical well-being of participants improved over the data collection points and the duration of this evaluation. Similarly, behavioural components linked to quality of life were also enhanced.

In line with relevant scientific literature, improving recruitment and streamlining resources to facilitate and expand the prehabilitation/rehabilitation ESNEFT service, will enhance its provision and accessibility, matching the complex needs of the oncological patients.

This will support the expansion of the service in line with the requests for including all oncological patients in prehabilitation/rehabilitation within the next 5 years (Humphreys, et al., 2024).

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Appendices

Questionnaires in Use

Name: _____

Surname: _____

Age: _____

Date of Birth: _____

Gender (please circle): Female - Male - Non-binary

Date today: _____

You will be asked to complete this questionnaire again 3 months, 6 months, 9 months and 12 months after today's date.

Are you taking part in the prehabilitation program? (please circle)

Yes	No	I don't know
-----	----	--------------

Condition (reason in the program): _____

Surgery or Main Treatment
(please circle):

I am not in need of surgery or treatment	Surgery/ treatment has not happened yet	Surgery/ treatment has taken place	I don't know about my treatment as yet
--	---	------------------------------------	--

If you **have had** surgery, are you currently taking part in the rehabilitation program? (please circle)

Yes	No	I don't know
-----	----	--------------

Are you currently participating in a regular exercise program? (please circle)

No	Once a week	Twice a week	Three times or more per week
----	-------------	--------------	------------------------------

If you answered yes in the previous question, are you taking part regularly in group exercise sessions?

No	Once a week	Twice a week	Three times or more per week
----	-------------	--------------	------------------------------

Do you access parts of the prehabilitation or rehabilitation information e.g. exercise class video, support information etc. **online**? (please

Yes	No
-----	----

 circle)

HADS

Instructions: Read each item and circle the reply which comes closest to how you have been feeling **in the past week**. Don't take too long over your replies: your immediate reaction to each item will probably be more accurate than a long thought out response.

*(please
above each list
are for office)*

I feel tense or 'wound up':	A
Most of the time	3
A lot of the time	2
Time to time, occasionally	1
Not at all	0

*disregard A & D
of numbers as they
use only)*

I feel tense as if I am slowed down:	D
Nearly all of the time	3
Very often	2
Sometimes	1
Not at all	0

I still enjoy the things I used to enjoy:	D
Hardly at all	3
Only a little	2
Not quite so much	1
Definitely as much	0

I get a sort of frightened feeling like 'butterflies in the stomach':	A
Very often	3
Quite often	2
Occasionally	1
Not at all	0

I get a sort of frightened feeling like something awful is about to happen:	A
Very definitely and quite badly	3
Yes, but not too badly	2
A little, but it doesn't worry me	1
Not at all	0

I have lost interest in my appearance:	D
Definitely	3
I don't take as much care as I should	2
I may not take quite as much care	1
I take just as much care as ever	0

I can laugh and see the funny side of things: D

Not at all	3
Definitely not so much now	2
Not quite so much now	1
As much as I always could	0

I feel restless as if I have to be on the move: A

Very much indeed	3
Quite a lot	2
Not very much	1
Not at all	0

Worrying thoughts go through my mind: A

A great deal of the time	3
A lot of the time	2
From time to time but not too often	1
Only occasionally	0

I look forward with enjoyment to things: D

Hardly at all	3
Definitely less than I used to	2
Rather less than I used to	1
As much as I ever did	0

I feel cheerful: D

Not at all	3
Not often	2
Sometimes	1
Most of the time	0

I get sudden feelings of panic: A

Very often indeed	3
Quite often	2
Not very often	1
Not at all	0

I can sit at ease and feel relaxed: A

Not at all	3
Not often	2
Usually	1
Definitely	0

I can enjoy a good book or radio or TV programme: D

Very seldom	3
Not often	2
Sometimes	1
Often	0

PFS-12

Directions: Please circle the number which best describes the fatigue you are experiencing **in the past 4 weeks** (if any).

1. To what degree is the fatigue you are feeling interfering with your ability to complete your work or school activities?

0	1	2	3	4	5	6	7	8	9	10
None										A great deal

2. Overall, how much is the fatigue which you are experiencing interfering with your ability to engage in the kind of activities you enjoy?

0	1	2	3	4	5	6	7	8	9	10
None										A great deal

3. How would you describe the degree of intensity or severity of the fatigue which you are experiencing?

0	1	2	3	4	5	6	7	8	9	10
Mild										Severe

4. To what degree would you describe the fatigue which you are experiencing as being:

0	1	2	3	4	5	6	7	8	9	10
Pleasant										Unpleasant

5. To what degree would you describe the fatigue which you are experiencing as being:

0	1	2	3	4	5	6	7	8	9	10
Positive										Negative

6. To what degree would you describe the fatigue which you are experiencing as being:

0	1	2	3	4	5	6	7	8	9	10
Normal										Abnormal

7. To what degree are you feeling:

Eating Wellbeing Check

Have you experienced unintentional or unplanned weight loss in the last 3 months?

Please circle the number that applies to you.

No weight loss	0
Some weight loss please specify _____	5
More than 1 stone (7kg) for men More than 12lbs (5.5kg) for women	10

1. Do you think that you are underweight?	No - 0	Yes - 5
2. In the last 5 days have you been eating less than half of all your meals?	No - 0	Yes - 5

3. Are you experiencing any symptoms affecting your food intake? (Sore mouth, feeling sick, being sick, constipation, diarrhoea?)	No - 0	Yes - 3
--	--------	---------

Today's Height (ft./cm)	
Today's weight (stones/kg)	
Please add up your score	Total =

IHS

Please **circle** the number which indicates the extent to which you agree or disagree with the following statements from 1=strongly disagree, to 6=strongly agree.

1. I have deep inner strength.

1	2	3	4	5	6
Strongly disagree					Strongly agree

2. I believe that each day has potential.

1	2	3	4	5	6
Strongly disagree					Strongly agree

3. I have a sense of direction.

1	2	3	4	5	6
Strongly disagree					Strongly agree

4. Even when others get discouraged, I know I can find a way to solve the problem.

1	2	3	4	5	6
Strongly disagree					Strongly agree

5. I feel my life has value and worth.

1	2	3	4	5	6
Strongly disagree					Strongly agree

6. I can see possibilities in the midst of difficulties.

1	2	3	4	5	6
Strongly disagree					Strongly agree

7. My past experiences have prepared me well for my future.

1	2	3	4	5	6
Strongly disagree					Strongly agree

8. I've been pretty successful in life.

1	2	3	4	5	6
Strongly disagree					Strongly agree

9. I have the faith that gives me comfort.

10. It is hard for me to keep up my interest in activities I used to enjoy.

1	2	3	4	5	6
Strongly disagree					Strongly agree

11. It seems as though all my support has been withdrawn.

1	2	3	4	5	6
Strongly disagree					Strongly agree

12. I am bothered by troubles that prevent my planning for the future.

1	2	3	4	5	6
Strongly disagree					Strongly agree

13. I am hopeless about some parts of my life.

1	2	3	4	5	6
Strongly disagree					Strongly agree

14. I feel trapped, pinned down.

1	2	3	4	5	6
Strongly disagree					Strongly agree

15. I find myself becoming uninvolved with most things in life.

1	2	3	4	5	6
Strongly disagree					Strongly agree

16. There are things I want to do in life.

1	2	3	4	5	6
Strongly disagree					Strongly agree

17. I look forward to doing things I enjoy.

1	2	3	4	5	6
Strongly disagree					Strongly agree

18. I make plans for my own future.

1	2	3	4	5	6
Strongly disagree					Strongly agree

19. I intend to make the most of life.

1	2	3	4	5	6
Strongly disagree					Strongly agree

20. I feel loved.

1	2	3	4	5	6
Strongly disagree					Strongly agree

21. I have someone who shares my concerns.

1	2	3	4	5	6
Strongly disagree					Strongly agree

22. I am needed by others.

1	2	3	4	5	6
Strongly disagree					Strongly agree

23. I am valued for what I am.

1	2	3	4	5	6
Strongly disagree					Strongly agree

SF-36

Directions:

Please insert the number that represents your best response in the box at the right-hand side of each question as in the example below:

Question no.	Question	Answer
Example	In general, would you say your health is: Excellent (1) Very good (2) Good (3) Fair (4) Poor (5)	4
Question no.	Question	Answer
1	In general, would you say your health is: Excellent (1) Very good (2) Good (3) Fair (4) Poor (5)	
2	Compared to one year ago, how would you rate your health in general now? Much better now than one year ago (1) Somewhat better now than one year ago (2) About the same (3) Somewhat worse now than one year ago (4) Much worse now than one year ago (5)	

Question #	Question	Answer
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The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so,

3	<p>Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports</p> <p>Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)</p>	
4	<p>Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf</p> <p>Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)</p>	
5	<p>Lifting or carrying groceries</p> <p>Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)</p>	
6	<p>Climbing several flights of stairs</p> <p>Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)</p>	
7	<p>Climbing one flight of stairs</p> <p>Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)</p>	

8	Bending, kneeling, or stooping Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)	
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Question #	Question	Answer
9	Walking more than a mile Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)	
10	Walking several blocks Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)	
11	Walking one block Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)	
12	Bathing or dressing yourself Yes, Limited a Lot (1) Yes, Limited a Little (2) No, Not limited at All (3)	
13	Cut down the amount of time you spent on work or other activities Yes (1) No (2)	
14	Accomplished less than you would like Yes (1) No (2)	
15	Were limited in the kind of work or other activities Yes (1) No (2)	

Question #	Question	Answer
16	<p>Had difficulty performing the work or other activities (for example, it took extra effort)</p> <p>Yes (1)</p> <p>No (2)</p>	

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

Question #	Question	Answer
17	<p>Cut down the amount of time you spent on work or other activities</p> <p>Yes (1)</p> <p>No (2)</p>	
18	<p>Accomplished less than you would like</p> <p>Yes (1)</p> <p>No (2)</p>	
19	<p>Didn't do work or other activities as carefully as usual</p> <p>Yes (1)</p> <p>No (2)</p>	
20	<p>During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?</p> <p>Not at all (1)</p> <p>Slightly (2)</p> <p>Moderately (3) Quite a bit (4)</p> <p>Extremely (5)</p>	

Question #	Question	Answer
21	<p>How much bodily pain have you had during the past 4 weeks?</p> <p>None (1) Very mild (2) Mild (3) Moderate (4) Severe (5) Very severe(6)</p>	
22	<p>During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?</p> <p>Not at all (1) Slightly (2) Moderately (3) Quite a bit (4) Extremely (5)</p>	
	<p>These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.</p>	
23	<p>Did you feel full of pep?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	

Question #	Question	Answer
24	<p>Have you been a very nervous person?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	
25	<p>Have you felt so down in the dumps that nothing could cheer you up?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	
26	<p>Have you felt calm and peaceful?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	

Question #	Question	Answer
27	<p>Did you have a lot of energy?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	
28	<p>Have you felt downhearted and blue?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	
29	<p>Did you feel worn out?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	
30	<p>Have you been a happy person?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	

Question #	Question	Answer
31	<p>Did you feel tired?</p> <p>All of the Time (1) Most of the Time (2) A Good Bit of the Time (3) Some of the Time (4) A Little of the Time (5) None of the Time (6)</p>	
32	<p>During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?</p> <p>All of the time (1) Most of the time (2) Some of the time (3) A little of the time (4)</p>	
33	<p>I seem to get sick a little easier than other people.</p> <p>Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false(5)</p>	
34	<p>I am as healthy as anybody I know.</p> <p>Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false(5)</p>	

Question #	Question	Answer
35	I expect my health to get worse. Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false(5)	
36	My health is excellent. Definitely true (1) Mostly true (2) Don't know (3) Mostly false (4) Definitely false (5)	

International Physical Activity Questionnaire (IPAQ SF)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and garden work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ **days per week**

No vigorous physical activities



Skip to question 3

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ **hours per day**

..... **minutes per day**

Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

..... **days per week**

No moderate physical activities



Skip to question 5

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

No walking



Skip to question 7

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a week day?

_____ **hours per day**

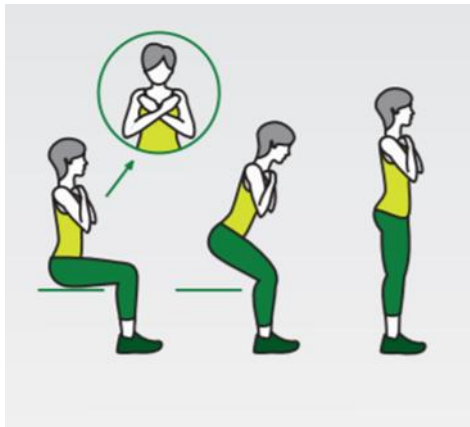
_____ **minutes per day**

Don't know/Not sure

This is the end of the questionnaire, thank you for participating. Now, please complete the 30 second chair sit to stand test as described below.

30 second sit to stand test

You will be shown how to perform this test to determine the maximum number of stands you can complete in 30 seconds in the workshop. After three months, six months, 9 months and 12 months you will be asked to perform the test at home.



Instructions

1. Use a folding chair without arms, with seat height of 17 inches (43.2 cm) placed against a wall to prevent it from moving.
2. Sit in the middle of the chair.
3. Place your hands on the opposite shoulder crossed, at the wrists.
4. Keep your feet flat on the floor, shoulder width apart, angled slightly back from the knees, with one foot slightly in front of the other to help maintain balance.
5. Keep your back straight, and keep your arms against your chest.
6. Rise to a full standing position, then sit back down again.
7. Repeat this for 30 seconds.
8. Record the number of complete stands you have completed in 30 seconds (more than halfway up at the end of 30 seconds counts as a full stand)

Number of complete stands in 30 seconds

Thank you for completing the questionnaires and test!

Feedback from Fit For Life patients

“Thank you for an opportunity to comment.

I have found the programme a great benefit. It has helped improve my general fitness and muscle strength to a greater extent than I would have otherwise achieved. It's easy to find exercises online or written down but having a scheduled programme ensures one does do them and there is also an opportunity to check they are being done correctly. In addition the ability to meet and see others and hear some of the issues we all share, aids by hearing how others cope or adapt. With mental health increasingly a concern these days, I think this may be a significant help to many. It certainly made me feel I was not alone.

I hope this helps as I am very grateful for being able to participate and am sure others will benefit too.”

“As a cancer patient I assumed once treatment stopped I would slip back into my normal routines. Because I'm a level headed person with a positive outlook, I also assumed I would need little help.

However, it has taken more out of me than I expected.

I attended a 6 week class after breast surgery. I was feeling delicate with the ongoing treatment and found this was very valuable in terms of physical and mental support.

I now attend Richards class. It is the perfect level. I have been saddened by the fact that I can not walk as I did, and have had to give up badminton for now. My regular keep fit class did not feel ready to accept me back, so this has been brilliant. It is knowing what, or how much to do in a friendly and un judgmental setting. Due to another commitment I can only attend alternate weeks. This flexibility has meant a lot, as it takes pressure off. If there had been pressure to attend weekly I may have given up. I feel this class is an incredibly important step on the road to recovery, and is something 'normal' classes could not provide. It is so important knowing that everyone there is on a journey, and that there is a shared unspoken understanding. It is led by someone who is totally aware of your situation, so you feel the exercises are safe, and gives confidence to get moving again. It makes a big difference to my well being at this time. I am so grateful this course is running. Thankyou.”

“Thanks for the opportunity to give my feedback.

Naturally I was feeling very low following my diagnosis.

The call from you, which came approx. 48 hours later, was a huge benefit and really lifted my mood.

Just knowing that there was someone else involved in my holistic care, along with the medical team, was extremely reassuring to both me and my wife.

I have spoken about the program, at length, to friends and family.

Since then, I have now attended 5 classes and look forward to each class every week.

It is also great that you make yourself available before and after each session for encouragement and advice.

I find the program a huge physical and emotional benefit as I now progress towards my treatment.

I cannot praise you or the program highly enough.

Thank you very much.”

“Happy to give feedback. As prehab classes I found them invaluable for a number of reasons:

- 1) Physical preparation for my operation to come. There is no doubt that my recovery from surgery was significantly enhanced by the classes, both the actual attendance and taking away the exercises to do at home
- 2) It was a positive experience mentally to feel that I was doing something positive as I approached the surgery. As I said to the seminar, it contributed towards taking control of a situation in which I had previously felt helpless
- 3) It was good to meet and talk to others in the same position, albeit at different stages
- 4) You are a very positive person to be around, encouraging and supportive - your own story makes the programme real

In short the prehab classes were especially important during the period between diagnosis and treatment, delivering significant benefits both mentally and physically. I should also say that this has continued since resumption, during the rehab phase.

I hope that this sums it up!”

“A few lines on what the sessions mean to me....

Following breast cancer treatment last year. Chemo, mastectomy and radiotherapy, my body had changed beyond recognition in my mind.

Pre cancer, I was a high level athlete playing hockey at an international masters level.

Pre cancer, I had good muscle mass and a all round top fitness level.

Training 3 times a week, with games at the weekend and then international high intensity training in Dublin.

Through chemo and the various drugs and treatments, I developed a chemo shell. Bigger than I had been before and with my muscles wasting away.

Through the John le vey centre, it was suggested I attend the cancer rehab fitness with Richard.

Possibly the best thing I signed up to post cancer.

Richard's sessions were based at a level of intensity that everybody could work with.

Very quickly, Richard's sessions enabled me to think positively about the future and adapting my chemo shell back to a body I resembled pre cancer.

Gradually, muscle mass began to return and my chemo damaged lungs began to clear.

Though Richard's sessions on a Tuesday, I was able to meet with an array of folk with the common denominator in cancer. All of us working at our own levels to achieve our own personal goals.

Richard's sessions are fun, with a great sense of humour and an amazing supportive nature, Richard gets the best from us all. We are all working at our own levels and for our own reasons attending the sessions.

My ultimate goal being a return to international hockey. This is a real possibility now thanks to Richard and the support of the John le vey centre. An amazing part of the cancer journey.

Thank you for sign posting me to Richard's sessions and your continued support throughout this very strange time."

"Since my diagnosis I've taken part in the PFE class, and also Richard's weekly exercise class.

Both are extremely well run, and are of great use and value to myself and I'm sure most if not all would feel the same.

The PFE has finished now, however I still attend Richard's class. He is an excellent instructor and always tailors the class to all abilities, taking time to make sure everyone is ok and answering questions and giving advice where required. He enables us to participate at our own pace and I for one, would not have gotten anywhere near as far, or have the confidence to exercise as I can now.

I would wholeheartedly support any possibility to expand the prehab/rehab facilities from a patient perspective as it would only enhance the experience and journeys of the wider cancer patient community.

You have a great team and I would like to offer my sincere thanks to Richard, the lady that did the PFE class, and all your colleagues for the excellent support and kindness you have shown me."

"I feel I have benefited greatly on the Keep Fit classes. In lots of ways.

Physically:

Being taught how to exercise correctly.

Enabling: Increased strength, control movements, bending correctly, balance (didn't realise my balance was bad before), posture. Enabling a lot of movements needed for everyday life.

Examples:

Could not walk far. On Holiday walked and walked following Keep fit techniques .

Carry shopping with out worrying now.

Bending without fear to pick my dog up.

Emotional:

Before Classes:

Fear to exercise.

Fear I am not exercise correctly.

Fear not enough before starting class.

Depressed

Very anxious

After Classes :

Confidence improvement

Self esteem improvement

Hope

Peer support not alone

Enjoying exercise

The information and video on how to follow the classes at home in-between classes very helpful.”

“The classes are pitched just right, warm up and down are easy and the rest is left to the individual to work as hard as they feel able.

Best parts for me are, Balance, Pelvic floor exercises, the correct way to exercise to get maximum benefit, and having the bands to exercise anytime.”

“I have found the classes excellent in preparing for radiotherapy. As someone who is overweight I need all the help I can get to lose some.

1 hour is about right, twice a week would have more impact.

Richard is an excellent host and pitches at the right level, keeping motivation high. If it were too hard people would not tune in.”

“The prehab programme is both helpful and enjoyable. Richard pays attention to each participant and makes the weekly sessions fun, providing encouragement, support and humour and friendly banter. He shows how exercises can be adapted for both the more healthy and experienced participants and those whose condition requires some compromise. He varies each weekly session so they stay fresh and enjoyable.

The health benefits are clear, as regular exercise helps us to keep fit and strong in light of the radiotherapy or whichever treatment is applicable. Personally I have progressed from performing exercises with the yellow band, to the red and lately onto the green band which I found challenging at first but no longer do. I'm sure that this is one of the reasons why I have had a far easier time going through my radiotherapy than I had expected from the related literature provided (even continuing my regular tennis).

The video is a useful tool and provides help for participants to continue exercises at home.

The course is well supported by Shona who helps with publicity, enrolment and ongoing support where needed.

The church hall is conveniently located and suitable. Remote meetings are held via Zoom when the hall is unavailable and these are also successful, with Richard again able to give us personal attention.

If the programme is expanded, e.g. to include more members I would prefer class sizes to still be small so Richard can give us the individual attention we have enjoyed to date. I would also like more different videos (or worksheets) to be provided so that we can more easily vary our home routine, more facilitation for participants to get to know one another and cover for weeks when Richard is unavailable.”

“I am pleased to say that I've found the rehab/rehab programme (ie the exercise classes!) very useful. In particular the 'group' nature of it - all of us doing it together makes it more fun and inclusive, and it makes one do it all as there's "no hiding"!! Of course, you always say that we should only do each of the exercises according to our physical abilities, and that's quite right, but being in a group makes you concentrate and

try that little bit harder! It has certainly helped me in my prehab phase, and I hope to rejoin the weekly classes at some stage after my op for the rehab phase...”

“The rehab classes have been amazing for me - they helped me reconnect socially as well as physically. Having gone through cancer treatment during the pandemic, the psychological and physical impacts were multiple.

The classes helped me regain some physical confidence, and it was so good to meet others with similar challenges - whether prehab or rehab. Now I'm a good way on from my original surgery, but I still attend classes as they will now be 'prehab' for me as I have more surgery coming up.

I attended some classes in person but now attend on line and find that both have worked well. I am keeping fitter, have gained core strength, and am more confident about upcoming surgery.”

“After being referred to the Colorectal Unit at Ipswich Hospital for bowel cancer treatment by the Bowel Cancer Screening Service, I was contacted by the John Le Vay Cancer Support team at Ipswich hospital and asked if I would like to attend a Prehab/Rehab exercise course. The object of the course was to prepare me properly for surgery and thereafter to enhance and improve my recovery. I enrolled on the course and initially found the exercises to be moderately easy. However as part of the course I was given some exercises to modify and improve my breathing into a method which would induce me to relax more and therefore reduce stress. I used these new breathing techniques immediately prior to surgery and was more than sufficiently calm and mentally prepared for the operation. I also used the method upon my immediate recovery and found that as I relaxed during the exercise performed on my recovery ward bed, my pain decreased and was much more easily managed. I have been attending the course regularly since my surgery and I have steadily lost weight, gained better fitness and self esteem. The course itself is attended by others and is specifically designed to assist all patients of different capabilities. Participation in any of the exercises is never compulsory and is always left to the individual . During the session capabilities are never pushed leaving each of us free to decide for ourselves whether to stop or continue exercising. A system which all my fellow classmates greatly appreciate. I am deeply indebted to Course Leader Richard Farrar and his team at the John Le Vay Centre for

providing such an enjoyable system of recuperation. I would highly recommend the course to all those people unfortunate enough to require it.”

“Following a diagnosis which would involve colorectal surgery it was suggested attending a newly formed exercise class would be beneficial. As I considered myself to be pretty fit my first reaction was not to take up the option but having learned what the treatment involved I started to attend the classes. Right from the start it was reassuring to see that each person was treated as an individual with Richard frequently checking that somebody’s breathing was alright or if another person’s shoulder was comfortable. At no time was anybody pressured, with an emphasis on stopping rather than carrying on regardless. It soon became obvious to me that there were a lot of muscles and particularly breathing exercises which were benefiting me. There are I have discovered additional benefits such as extending the exercise routine for a replacement hip and more particularly pelvic floor exercises which are a great help following prostate cancer treatment.”

“I've been attending Richard's cancer rehabilitation classes for some time and have definitely found that, following major abdominal surgery, my core muscles are responding well and I feel stronger, fitter and generally healthier. Not only that, but Richard always imparts useful information, is motivational and - importantly - makes the sessions fun and inclusive. I really value the classes - even when we had to move to online.”