**Title:** Understanding how two cancer rehabilitation services work for people in South Wales, UK: findings from a mixed-methods study

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Background: Two cancer rehabilitation (CR) services provide in- and outpatient support, such as a 12-week exercise programme, fatigue management groups etc., in two oncology centres in South Wales, UK. However, some cancer patients still report unmet rehabilitation needs. The aim of this study was to investigate how the two CR services work, for whom, and in what circumstances.

Methods: A realist informed mixed-methods study was conducted. Quantitative secondary analysis of a CR database containing pre and post rehabilitation outcome measure data (e.g.: FACIT-F, etc.) was performed using paired t-test or Wilcoxon signed rank test. Qualitative, semi-structured interviews with rehabilitation professionals (n=20) and cancer patients (n=15) were conducted and reflexive thematic analysis was used to develop themes.

Results: The quantitative data showed that the 12-week exercise programme potentially led to improved fatigue and mobility (p<0.05), which was supported by some qualitative accounts. However, several factors hindered adequate CR provision. Insufficient needs assessment and care coordination could have led to unmet needs, whilst unmanaged therapeutic relationships might have resulted in cancer patients' dependency on CR services and a lack of self-management behaviour.

Conclusion: Improved coordination of patient support and boundary setting for CR services is needed. However, some of these issues cannot be resolved until CR is fully embedded in the cancer pathway.