



Healthcare professionals and physical activity, working together for exercise referral: a scoping review

Ellie Rossiter^{1,2} · Rob Southall-Edwards^{1,2} · Valerie Gladwell^{1,2}

Received: 17 April 2025 / Accepted: 6 August 2025
© The Author(s) 2025

Abstract

Aim To explore how healthcare professionals collaborate in the context of exercise referral, the supporting mechanisms for this and how specialised physical activity (PA) programmes are designed and delivered, to promote PA in patients and the wider community.

Subject and methods This scoping review followed the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) guidelines. PubMed, CINAHL, and SCOPUS databases were searched to identify literature, within the scope of the research questions, published from 1st January 2013 to 23rd October 2023. Data was extracted using a standardised data charting form, all authors were involved in thematically and visually representing the data, and a narrative synthesis summarised the evidence.

Results Thirty-nine studies were included in this review. Three themes were identified in relation to the research questions: 1) confidence of health care professionals (HCPs); 2) person-centred approaches; 3) joined-up systems. Sub-themes were identified within these three broader themes.

Conclusion The findings of this review highlight the need to move beyond viewing exercise referral schemes (ERS) as a linear referral pathway and instead conceptualise it as a dynamic, interconnected network embedded within the wider system (i.e., healthcare, leisure, community). Ongoing collaboration, stakeholder engagement, and feedback mechanisms are essential to building and maintaining trust, increasing awareness, and ensuring referral pathways remain both active and effective. A more connected and adaptive approach to ERS can better support diverse needs, reduce inequalities, and facilitate sustained long-term PA behaviour change.

Keywords Exercise prescription · Exercise referral · Healthcare · Physical activity

Background

Physical inactivity represents one of the leading modifiable risk factors for non-communicable diseases and health conditions worldwide (Lee et al. 2012; WHO 2022). The substantial health and economic burden associated with sedentary lifestyles has been well-documented, with the World Health Organisation (WHO) estimating that physical inactivity contributes to millions of premature deaths annually

and carries a significant financial toll on healthcare systems globally, costing health systems an estimated 27 billion US dollars per year (WHO 2022). In response to this public health challenge, various initiatives have been developed to promote physical activity (PA) and bridge the gap between healthcare and community-based exercise opportunities.

Exercise referral schemes (ERS) have emerged as a promising approach to address this issue by enabling healthcare professionals (HCPs), such as doctors or physiotherapists, to refer patients to structured exercise programs tailored to their specific needs and health conditions (Dunphy and Blane 2024; NICE 2014). According to guidelines set forth by the National Institute for Health and Care Excellence (NICE 2014), ERS typically involve several key components: an initial assessment by a primary care or allied health professional to determine an individual's current activity level, a formal referral to a PA specialist or service, a personalised

✉ Rob Southall-Edwards
r.southall-edwards@uos.ac.uk

¹ Institute of Health and Wellbeing, University of Suffolk, 19 Neptune Quay, Ipswich IP4 1QJ, UK

² School of Sport Rehabilitation and Exercise Sciences, University of Essex, Wivenhoe Park, Colchester CO4 3SQ, UK

assessment to design an appropriate exercise program, and the opportunity to participate in the recommended activities. These schemes aim to provide a safe and supportive environment that encourages individuals to adopt and maintain physically active lifestyles, while also offering necessary guidance and resources to facilitate long-term behaviour change. Some schemes also incorporate follow-up assessments to track participants' progress and provide ongoing support.

While ERS have demonstrated promising results in improving health outcomes, particularly for those with cardiovascular and mental health conditions, the evidence regarding their overall effectiveness and cost-efficiency remains mixed; several reviews have examined the impact of ERS on various health outcomes, with some studies reporting modest, short-term increases in PA levels (Pavey et al. 2011; Williams et al. 2007). However, these reviews have also highlighted the need for more targeted, disorder-specific approaches and raised questions about the long-term sustainability and cost-effectiveness of ERS when implemented in isolation within primary-care settings (Campbell et al. 2015; Rowley et al. 2018; Werbrouck et al. 2022; Anokye et al. 2011).

Furthermore, despite evidence-based policy recommendations such as the World Health Organisation's Global Action Plan on Physical Activity 2018–2030 (GAPPA), the implementation of ERS has been limited, with minimal progress in increasing population-level PA (WHO 2018). GAPPA emphasises the importance of collaboration between healthcare, community organisations, and other sectors to create supportive environments and systems for PA promotion. However, ERS often operate in isolation (i.e., a 12-week strength and balance scheme delivered in a medical setting), highlighting a critical gap in realising GAPPA's vision of integrated, systems-based solutions (WHO 2018). Economic and structural barriers, such as resource limitations and workforce constraints, further hinder the implementation of ERS, especially in low-income settings, exacerbating global health inequities (Santos et al. 2023).

Only 56% of UK medical schools include PA promotion in their curriculum, and 55% of GPs report no training in this area (Chatterjee et al. 2017; Weiler et al. 2012). Therefore, HCPs may not be best positioned to deliver PA promotion. Studies by Inkpen et al. (2024) and O'Brien et al. (2021) have highlighted the importance of linking primary care providers with qualified exercise professionals (QEPs) to deliver personalised exercise counselling, prescription, and supervision. This method may offer a more sustainable approach to PA promotion, reducing the burden on HCPs. Given their specialised training and expertise, QEPs may be uniquely placed to enhance the effectiveness of PA promotion. Whilst embedding PA promotion in healthcare remains a viable strategy (Netherway et al. 2021), it is crucial to

understand the underlying mechanisms that facilitate effective collaboration between healthcare providers, QEPs, and the community.

Social prescribing is a related yet distinct approach that enables HCPs to refer patients to non-medical, community-based services to address their health and wellbeing needs (Bickerdike et al. 2017; Chatterjee et al. 2018). Although PA may form part of social prescribing, it is not its primary focus (Chatterjee et al. 2018; Napierala et al. 2022). Instead, social prescribing adopts a holistic perspective on health, leveraging community assets through link workers who assess patients' non-medical needs and connect them with appropriate local services (Bickerdike et al. 2017; Napierala et al. 2022; Pescheny et al. 2020). Through addressing broader determinants of health and promoting social inclusion, social prescribing seeks to reduce health inequalities and enhance overall wellbeing (Elliott et al. 2022; Husk et al. 2020).

The diverse range of PA interventions, and the challenges associated with their implementation and delivery, underscore the need for a deeper understanding of the supporting mechanisms and collaborative processes that facilitate successful ERS. Carstairs et al. (2020) have proposed a framework that categorises PA promotion methods within primary care into three distinct levels of engagement: (1) passive signposting (providing written materials and resources), (2) active signposting (direct discussion and recommendation of specific opportunities), and (3) formal referral or prescribing into structured exercise programmes. Identifying the factors that enable effective communication, coordination, and resource sharing among stakeholders at each of these levels is crucial for enhancing the impact and sustainability of ERS (Speake et al. 2016).

Aim

The objective of this scoping review is to explore how HCPs collaborate with specialised PA providers, including QEPs, through ERS to promote increased PA in healthcare and the wider community. We aim to identify the supporting mechanisms that facilitate this process and understand the challenges encountered when referring people into PA programmes. By considering the diverse range of influences on PA behaviour, this review will inform the development of more integrated, context-sensitive approaches to embedding PA.

Methods

This scoping review was developed in line with the five stages set out by Arksey and O'Malley (2005) and further expanded upon by Levac et al. (2010) and considers recent

developments and best practices for the conducting and reporting of scoping reviews (i.e., Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation (Tricco et al. 2018).

Protocol and registration

The protocol for this scoping review was developed and registered on the Open Science Framework (OSF) on 18/07/2024. The registration can be accessed: <https://doi.org/10.17605/OSF.IO/48WFD>. This scoping review was conducted in accordance with the registered protocol; any deviations are noted and explained in the relevant sections of this manuscript.

Ethical considerations

This scoping review analysed previously published studies and did not involve direct human or animal subjects; therefore, formal ethical approval was not required. However, we adhered to ethical research practices throughout the review process, including accurate representation of findings, proper source acknowledgement, and transparency in methodology and reporting. Any conflicts of interest were declared and managed appropriately.

Scoping review process

Stage 1: identifying the research questions

The objective of this scoping review was to explore how HCPs collaborate with specialised PA providers through exercise referral to promote increased PA in patients and the wider community. The PCC (population, concept and context) method has been implemented to generate the following questions (Pollock et al. 2023):

- 1) What causal and supporting mechanisms facilitate joined up working between health care professionals and specialised PA programmes?
- 2) What challenges exist when referring individuals into PA programmes?

Stage 2: identifying relevant studies (search strategy)

Two authors (RSE & ER) conducted pilot investigations and discussed appropriate databases and search terms to identify literature within the scope of the review. A comprehensive search strategy was developed and applied to PubMed, CINAHL, and SCOPUS databases. These databases were selected due to their comprehensive coverage of medical, nursing, and allied health literature, ensuring a thorough

search of relevant publications in the field of exercise referral and healthcare.

The following search string was used:

("exercise referral scheme" OR "exercise referral program*" OR "exercise prescription" OR "exercise referral pathway*" OR "physical activity referral" OR "exercise referral scheme*" OR "exercise referral" OR "exercise prescription" OR "exercise on prescription" OR "exercise referral pathway*") AND (healthcare OR "primary care" OR "secondary care" OR leisure OR community).

This search strategy was designed to capture a wide range of terms related to ERS while also including healthcare and community contexts where schemes are delivered. Searches were limited to studies involving human participants, published in peer-reviewed journals, subjected to a rigorous review process, ensuring a high standard of evidence applicable to the general population. Studies were excluded if they were not in English language to ensure language was not a barrier to clear interpretation. Only studies published between 1st January 2013 to 23rd October 2023 were included. This date range was chosen to ensure key concepts in contemporary research were identified and relevant in the context of a dynamic and continually evolving healthcare system. By focusing on this recent decade, we aimed to capture the most up-to-date practices and insights in ERS.

No searches of grey literature were performed, and no manual searches of bibliographies were conducted. While this may have limited the scope of included studies, our broad database search strategy was designed to capture the majority of relevant peer-reviewed literature within our specified established criteria. As suggested by Arksey and O'Malley (2005), a broad search including numerous concepts related to the research question, will likely retrieve the vast majority of relevant studies.

Stage 3: study selection

Table 1 outlines the detailed eligibility criteria used for including and excluding studies in this scoping review. These criteria were applied at each stage of the screening process to ensure that only relevant studies were included in the final analysis. In line with the pragmatic approaches outlined by Arksey and O'Malley, part of the eligibility criteria was developed "post-hoc" through collaborative discussions as more familiarity with the topic was gained.

It's important to note that while our search strategy captured terms related to exercise referral, we specifically excluded studies focusing solely on Social Prescribing. Although Social Prescribing can include PA components, its broader scope encompasses various non-clinical interventions beyond our focused interest in ERS. This

Table 1 Eligibility criteria for scoping review

Criterion	Inclusion	Exclusion
Population	Adult participants over 18 years	Participants younger than 18 years old
Context	Focus must be predominantly on physical activity, sport or exercise referral	Focus on physical activity, sport, or exercise promotion without a direct referral process or intervention. Studies focusing solely on social prescribing
Concept	Describes causal and supporting mechanisms for design, implementation, and/or delivery of exercise referral scheme	Focus on outcome measures of exercise referral programme. No detail of causal and supporting mechanisms for design, implementation and/or delivery of exercise referral scheme
Publication type	Peer-reviewed research	Policy guidelines, conference abstracts, conference papers
Language	Originally produced in English Language	Not Originally produced in English Language
Date	Studies published between 1 st January 2013 to 23rd October 2023	Studies not published between 1 st January 2013 to 23rd October 2023

exclusion allowed us to maintain a specific focus on pathways and collaborations directly related to exercise/PA referrals.

Eligibility criteria (Table 1) were implemented across a rigorous four-stage screening procedure to select relevant studies:

- I. Initial processing: literature search results were imported into a reference manager (Endnote X9.1), where duplicates were identified and removed. The remaining results were then imported into Rayyan for a final duplicate check.
- II. Title screening: two authors (ER and RSE) independently screened a subset of titles (20%) based on the established eligibility criteria. After reaching an acceptable level of agreement ($\kappa \geq 0.8$) (McHugh 2012; Pum 2019), one author (ER) screened the remaining titles (80%).
- III. Abstract screening: two authors (ER and RSE) independently screened a subset of abstracts, based on the eligibility criteria and did not reach an acceptable level of agreement ($\kappa \geq 0.8$). Therefore, both authors (ER and RSE) independently screened all remaining abstracts and discussed any conflicts to reach an agreement.
- IV. Full-text screening: full-text articles were independently screened by two authors (ER and RSE). Any conflicts were discussed to reach an agreement, and reasons for exclusion at this stage were documented.

Throughout the screening process, an additional author (VG) was consulted to resolve any instances where an agreement could not be reached between the two primary screeners. This approach ensured a thorough and unbiased selection process, with a third reviewer available to resolve any disagreements at both the abstract and full-text screening stages.

Stage 4: charting the data

A standardised data extraction form (Microsoft Excel) was developed by two authors (ER and RSE) to ensure consistency in data extraction and that information reflected the aims of this review:

1. Author(s)
2. Publication date
3. Title
4. Research aim(s)/question(s)
5. Methodology
6. Participants
7. Main findings
8. Limitations
9. Salient points relating to each of our research questions

Data extraction was performed by one author (ER), with regular engagement and review by a second author (RSE) to ensure accuracy and consistency. In cases of uncertainty or disagreement about the extracted data, a third author (VG) was consulted, and a decision was reached by consensus. Data charting was an iterative process whereby the data-charting form (see Supplementary material) was continually revisited and updated as our knowledge on the topic evolved. This approach allowed for flexibility in capturing emerging themes and ensured comprehensive data extraction aligned with the review's objectives.

Stage 5: collating, summarising and reporting of the results

Following the data extraction process, we employed a narrative synthesis approach to analyse and interpret the collected information:

1. Familiarisation with the data: researchers thoroughly reviewed the extracted data to gain a comprehensive understanding of the content.
2. Thematic analysis: we identified recurring themes and patterns across the included studies, particularly focusing on aspects related to the research questions. These themes included causal and supporting mechanisms for ERS, challenges in referral processes, and factors contributing to successful referrals.
3. Categorisation: the identified themes were categorised and organised to create a coherent narrative that addressed our research questions.
4. Synthesis: we synthesised the findings within each category, noting similarities, differences, and gaps in the existing literature.
5. Critical analysis: researchers critically examined the synthesised information, considering the implications for ERS and identifying areas requiring further research.
6. Visual representation: where appropriate, tables and figures were developed to summarise key findings and illustrate relationships between concepts.
7. Narrative development: finally, a narrative summary was constructed, presenting a comprehensive overview of the current state of knowledge regarding ERS, addressing our research questions and highlighting key insights.

Throughout this process, we maintained regular team discussions to ensure consensus on the interpretation and presentation of findings. The results of this analysis are presented and organised according to the research questions and the main themes that emerged from the literature.

Findings

Study selection

The process of study selection, from initial identification through final inclusion in the scoping review, is illustrated in Fig. 1. As shown in the PRISMA flow diagram (Fig. 1), our initial database search yielded 932 records. After removing duplicates, 339 records remained for title screening. Following title and abstract screening, 64 full-text articles were assessed for eligibility. Of these, 25 full-text articles were excluded, with reasons documented. The final number of studies included in the scoping review was 39.

Characteristics of included studies

This scoping review included 39 studies published between 2014 and 2023. The geographical distribution of studies was as follows: United Kingdom ($n=17$), United States ($n=5$), Australia ($n=4$), Canada ($n=3$), Ireland ($n=3$), France

($n=2$), and Germany ($n=1$). Four papers did not refer to specific countries, including a review (data from eight countries) and commentary pieces.

The research designs employed were diverse: mixed methods ($n=9$), qualitative ($n=18$), qualitative ($n=4$), systematic reviews ($n=2$), and other designs including commentaries/correspondence ($n=5$) and a report ($n=1$).

The studies investigated diverse populations, from HCPs to patients with specific conditions (e.g., multiple sclerosis) and the general public. Research settings primarily involved healthcare environments, including primary care facilities, hospitals, and community-based services.

Interventions examined focused on ERS, PA programs, and healthcare delivery models emphasising patient-centred care. Key outcome measures included PA levels, adherence to exercise programs, HCPs' perspectives, and patient experiences.

A detailed summary of the included studies, including authors, publication years, research aims, methodologies, key findings, and salient points relevant to this review, is presented in Table 2.

Themes

Three themes were identified in relation to the two research questions: *What causal and supporting mechanisms facilitate joined up working between health care professionals and specialised PA programmes? What challenges exist when referring individuals into PA programmes?* The themes were 1) confidence of health care professionals (HCPs), 2) person-centred approaches, and 3) joined-up systems. Sub-themes were identified within these three broader themes.

Confidence of HCPs

HCPs' confidence emerged as a crucial factor in their decision to refer patients to exercise referral programmes, with evidence suggesting that HCPs have low confidence in their ability to make accurate referrals (Bray et al. 2023). HCPs' confidence influences the referral process, possibly contributing to the significant inconsistencies in referral rates across HCPs. This theme focuses on four key aspects: 1) referrer characteristics and behaviours, 2) knowledge and awareness of referral, 3) trust and accountability, and 4) training to prescribe and promote PA.

Referrer characteristics and behaviours Individual characteristics of HCPs can significantly influence their likelihood to refer patients to exercise programmes. For instance, younger professionals (Morgan et al. 2021) and professionals who regularly exercise themselves are more likely to refer others to exercise practices, possibly due to their intrinsic understanding of and confidence in the benefits

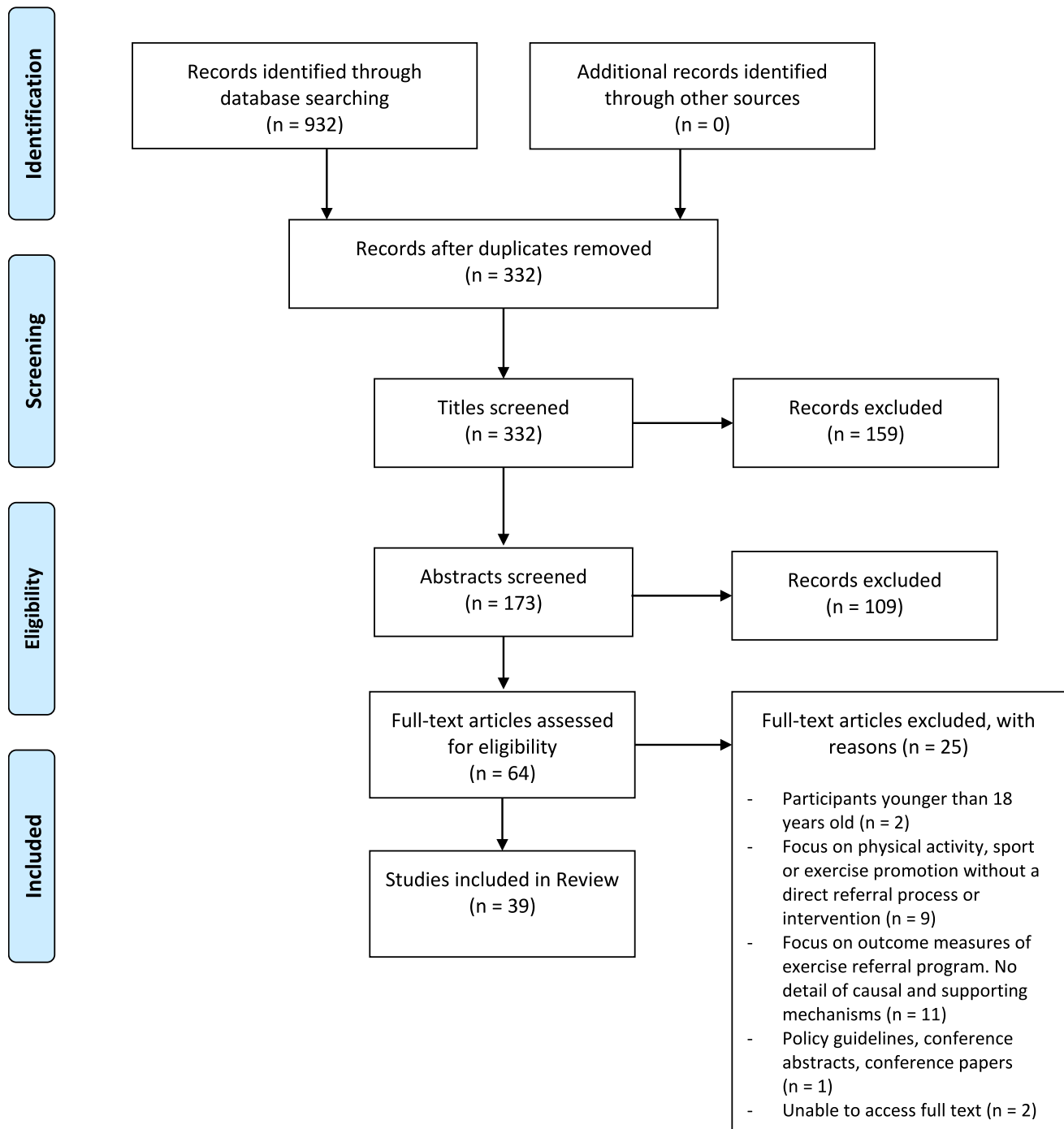


Fig. 1 PRISMA flow diagram of study selection. Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-

Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. <https://doi.org/10.1371/journal.pmed1000097>

of PA participation (Charles et al. 2022; Din et al. 2015). Conversely, some GPs report feeling hypocritical when promoting PA to patients if they themselves are inactive, which can reduce the number of referrals they complete (Din et al. 2015; Lion et al. 2019). These findings highlight how

personal experiences and behaviours can shape a HCP's confidence and willingness to engage in exercise referral.

Knowledge and awareness of referral A commonly reported barrier to referral is low confidence among HCPs in their

Table 2 Summary of included studies

Author(s) & year	Title*	Research aim(s)	Methodology & participants	Key findings	Salient points for this review	Relevant RQ(s)
Abu-Omar et al. 2021	Coproduction for preventive health in Germany	Reflect on experience of coproducing and implementing ERS in German healthcare system	Commentary on coproduction process ($n = 12$ organisations)	Co-production process challenging but effective; knowledge gaps and leadership issues identified	Flexible approach to co-production; lack of knowledge about existing pathways; need for collective effort	1
Albert et al. 2020	Functionality of PARS: systematic review	Examine PARS process across different countries	Systematic review; 27 studies from eight countries	PARS is a key driver for PA; guidelines, group activities, and PA specialists aid adherence	Interventions to manage chronic disease; need for referral to other professionals	1, 2
Albert et al. 2021a, b	Australian patients' perception of PARS	Explore patients' experiences of PARS for program optimisation	Mixed methods: survey ($n = 111$) and interviews ($n = 15$)	Positive perceptions of PARS, but structural bottlenecks impact outcomes and uptake	Scarcity of referral pathways; lack of knowledge; time and cost constraints	1, 2
Albert et al. 2021a, b	The 'price' of PARS: stakeholders' recommendations	Optimise quality of care in PARS referrals to enhance PA and patient health outcomes	Qualitative: semi-structured interviews with GPs, patients, and EPs ($n = 40$)	Five key themes identified: promote, relate, incentivise, communicate, educate (PRICE)	Model/outline for referral; rapport building between HCPs and patients	1, 2
Allin et al. 2023	Training impact on postnatal PA program referral	Understand value of training for health professionals in referring postnatal women to PA program	Qualitative: semi-structured interviews ($n = 7$) with early years practitioners, health visitors, and community midwives	Training increased capability to refer by improving knowledge and confidence	Two-way referral process; challenges in communication and links with other services; increased knowledge and confidence required	1, 2
Below et al. 2021	Cancer survivors' experience in RENEW program	Explore young adult cancer survivors' experiences of RENEW programme	Qualitative: semi-structured interviews with YACS ($n = 16$)	Three major themes: motives for participation (health, confidence, support), experience of RENEW (enrolment, barriers), and impact of RENEW (physical, vitality, outlook)	Barriers to enrolment, including healthcare requirements	2
Borchers et al. 2019	PT decision-making tool for PD exercise classes	Propose a decision-making tool for assigning persons with PD to multilevel group classes	Mixed methods: Retrospective medical record review ($n = 92$) and therapist consensus	Physical therapists are uniquely qualified to manage lifelong exercise prescription for PwP	Framework to communicate and coordinate care	1
Bourke et al. 2018	Exercise guidelines for men with prostate cancer	Examine exercise referral availability for men on ADT	Mixed methods: electronic survey ($n = 95$), focus groups ($n = 26$), and interviews ($n = 37$) with HCPs	Evidence-based national exercise guidelines are not being delivered as intended	HCP with necessary skills; HCP buy-in; MDT approach; tailored referrals	1, 2

Table 2 (continued)

Author(s) & year	Title*	Research aim(s)	Methodology & participants	Key findings	Salient points for this review	Relevant RQ(s)
Bourke et al. 2022	Barriers and motives in cardiac rehab programme	Identify factors influencing adherence and drop-out in ULMedX cardiac rehab programme	Qualitative: interviews with long-term attendees ($n=7$) and dropouts ($n=7$)	Participants more likely to commit if they believed in health benefits, had positive attitude to exercise, and felt in control of attendance	Importance of feeling safe, trusting staff, peer support; barriers include physical limitations and fear of exacerbating conditions	1, 2
Bray et al. 2023	Collaboration between medical and exercise professionals	Propose establishing collaborations between physicians and QEPs to address sedentary population	Commentary	Crucial opportunity to establish collaborations between physicians and QEPs	Ways to begin networking; reinforces need for collaboration; building trust; training;	1, 2
Buckley et al. 2018	Co-development of a PA referral scheme	Report process data from participatory co-development of an ERS	Qualitative: iterative co-development of ERS by multidisciplinary stakeholder group ($n=18$), analysis of process through audio recordings, observations, reflective notes, and visual data	Factors to consider: current ERS culture, skills, safety, accountability, resources, and capacity	Cultural shift required; discussion of having a dedicated person such as health trainer;	1, 2
Buckley et al. 2020	PA counselling and referral in General Practice	Investigate GP perspectives on PA counselling and referral	Mixed methods: online survey ($n=56$) and semi-structured interviews ($n=7$) with GPs	Multi-level strategies required to help GPs promote PA and use ERSs	Referral to fitness centres; ways to communicate with GPs; non-clinical staff involvement	1, 2
Camhi et al. 2021	Factors in urban ExRx program for under-resourced women	Explore barriers and facilitators for ExRx adherence in under-resourced women	Mixed methods: questionnaires and semi-structured interviews with patients who had been prescribed exercise ($n=30$)	Success dependent on motivation, confidence, peer support, location, and ease of access	Referrals made by various HCPs; word-of-mouth referrals	1, 2
Charles et al. 2022	PA prescription in French primary care	Study effect of legislative framework on PA prescription practices	Quantitative: cross-sectional survey of GPs ($n=283$)	Regular PA critical in profile of current prescribers; multiple barriers emerged	Need to know where to refer patients; need for additional training; regular PA in effective prescribers	1, 2
Cheema et al. 2014	Exercise physiologists as health-care professionals	Present data on Medicare-funded services provided by AEPs	Report from Australia 2006–2012	Integration of exercise professionals within healthcare systems could tackle NCD pandemics	Recommendation for system where allied HCPs, including QEPs, can function within a disease prevention framework	1

Table 2 (continued)

Author(s) & year	Title*	Research aim(s)	Methodology & participants	Key findings	Salient points for this review	Relevant RQ(s)
Crozier et al. 2020	Peer-support PA intervention for older adults	Explore facilitators and challenges of delivering peer-support PA intervention for older adults	Qualitative: semi-structured interviews ($n=7$) and focus group ($n=5$) with stakeholders	Facilitators included social interaction, community referral pathways; challenges included inconsistent practice, staff capacity	Joined-up working; health trainer; community-based HCP	1, 2
Din et al. 2015	Health professionals' views on NERS in Wales	Explore health professionals' perceptions of their role in promoting PA and experiences of NERS	Qualitative: semi-structured group interviews with health professionals ($n=46$)	Many thought PA promotion was outside their expertise; concerns about patient selection criteria and lack of feedback	Selective and subjective GP referrals; GP engagement and time; patient self-referral;	1, 2
Dodd-Reynolds et al. 2020	Northumberland ERS as weight management program	Examine associations of sociodemographic predictors, obesity class and profession of referrer on weight and PA variables	Mixed methods: quantitative data analysis ($n=3624$) and qualitative interviews ($n=7$)	ERS has potential to reduce obesity inequalities, but care should be taken to ensure equitable provision	Inconsistencies in referring; HCP time to recognise indicators for referral	1, 2
Downey et al. 2021	Behaviour change in exercise referral schemes	Build initial ideas about implementation of behaviour change practices in ERSs	Qualitative: focused ethnography (participant observation, interviews, document analysis, and reflexive journaling) as first phase of realistic evaluation of an ERS	Conveyed necessary elements for implementing behaviour change practices in ERSs	Emerging theories about conditions, resources, and explanations of behaviour change implementation can inform service development	1, 2
Garner-Purkis et al. 2020	Community-based program for PA in deprived area	Examine experiences of participants and staff in a novel ERS	Qualitative: semi-structured interviews with project participants and staff ($n=35$)	Free or subsidised classes with individualised assessment facilitated engagement; supportive social context was a major facilitator	Mentors within the scheme; awareness of opportunities; initial free classes as incentive; lack of feedback; self-referral and motivation	1, 2
Hanson et al. 2019	Participant experiences in Northumberland ERS	Gain insight into varied engagement through understanding participant experiences	Qualitative: longitudinal approach using semi-structured interviews ($n=11$)	Three themes emerged: 'success', 'struggle', and 'defeat'	'One-size-fits-all' model does not adequately cater for complex range of referrals; cyclical needs; person-centred approach	1, 2
Johnston et al. 2016	Pulmonary rehabilitation in rural settings	Explore perspectives of rural and remote health care professionals on pulmonary rehabilitation	Mixed methods: surveys and face-to-face interviews with health care professionals ($n=25$)	Main issues: staffing, time constraints, patient attitudes, lack of knowledge, ensuring sustainability	HCP staffing issues; irregular coverage; lack of confidence; cultural awareness	1, 2

Table 2 (continued)

Author(s) & year	Title*	Research aim(s)	Methodology & participants	Key findings	Salient points for this review	Relevant RQ(s)
Learmonth et al. 2017	MS patients' needs for exercise promotion	Identify needs and wants of MS patients from healthcare providers regarding exercise advice and support	Qualitative: semi-structured interviews with MS patients ($n = 50$)	Established three key needs: materials, knowledge, and behavioural change strategies for exercise promotion	Importance of HCP referrals to QEPs; need for appropriate exercise recommendations; social accountability as a strategy	1, 2
Learmonth et al. 2018	Promoting exercise for MS patients	Explore HCP' needs for promoting exercise among persons with MS	Qualitative: semi-structured interviews with neurologists, OTs, PTs, and nurses ($n = 44$) Debate/commentary	Three themes: opportunities for exercise promotion, healthcare provider education, patient tools/strategies	Providers wanted consistency of information and resources; need for additional training	1, 2
Lion et al. 2019	PA promotion in primary care	Discuss factors contributing to success or failure of PA promotion in primary care	Debate/commentary	Synergic and multisectoral action of stakeholders will help overcome physical inactivity in a sustainable way	Lack of time and competing priorities. Various schemes and pathways outlined; Care Sport Connectors' concept; influence of HCP own experiences	1, 2
Maiorana et al. 2018	Shared care in exercise prescription	Comment on CASEM position statement on physical activity prescription	Correspondence	Commend CASEM on position statement to better equip physicians for PA prescription	CEPs to conduct process more comprehensively than possible in standard physician consultation; interdisciplinary teams and feedback	1
McHale et al. 2020	Green Health Partnerships in Scotland	Explore views and experiences of professionals involved in establishing Green Health Partnerships	Qualitative: focus groups and semi-structured interviews with professionals ($n = 55$)	Green health considered good strategic fit but not fully embedded; concerns about sustainability	Green health messaging pathway not consistent or joined up; need for cultural shift	1, 2
Morgan et al. 2021	Adherence to exercise referral schemes	Examine participant views on exercise referral schemes	Systematic review ($n = 33$)	Themes for participant views classified as intrinsic and extrinsic; recommendation for social support	Focus on patient views and adherence	2
Morgan et al. 2021	Stakeholder experiences of NERS in Wales	Explore perceptions and experiences of referral to NERS among referrers, scheme deliverers and patients	Qualitative: semi-structured interviews with stakeholders ($n = 50$)	Multi-level strategies required; barriers include lack of consultation time and feedback	Efforts to engage with referrers; awareness and trust building with HCPs; need for automated system; referrer characteristics	1, 2

Table 2 (continued)

Author(s) & year	Title*	Research aim(s)	Methodology & participants	Key findings	Salient points for this review	Relevant RQ(s)
Nguyen et al. 2022	Determinants of exercise for cancer patients	Offer socio-ecological perspective on determinants of exercise promotion among oncology services	Qualitative: case study analysing exercise promotion in oncology services; semi-structured interviews ($n=36$)	Five determinants emerged, including exercise as a complement to treatment and timing of exercise	Having dedicated individuals to refer patients to; HCPs have limited time and expertise	1, 2
O'Brien et al. 2021	PA counselling among Nova Scotia dietitians	Evaluate perceptions and practices around PA counselling and exercise prescription in dietitians	Qualitative: online province-wide survey of dietitians ($n=95$)	Need for interventions to assist dietitians in implementing PA counselling and providing written exercise prescriptions	Need to know who to refer to and how to refer; perceived patient interest as main barrier	1, 2
Oliver et al. 2021	Inequalities in Exercise Referral Schemes	Understand who exercise referral schemes do and do not work for and why	Mixed methods: national referral data modelling and qualitative interviews ($n=4$)	Exercise referral can positively impact health inequalities; local partnerships can strengthen this approach	Health service developments forming partnerships between GP surgeries; tailored support	1, 2
Portman et al. 2023	ERS participant characteristics and outcomes	Investigate associations between ERS participants/referral characteristics and likelihood of accessing/completing scheme	Quantitative: cross-sectional evaluation of referral participant characteristics ($n=637$)	Positive associations between referral characteristics and mode of ERS entry	Emphasis on self-referral; project support officer	1, 2
Seth 2014	Exercise prescription in primary care	Discuss exercise prescription in primary care	Commentary	Discusses exercise prescription in primary care	Exercise is medicine initiative; lack of time, referral pathways, knowledge; adequate patient follow-up	1, 2
Sheill et al. 2023	Hospital to community exercise referral pathway	Develop and explore feasibility of pilot exercise referral pathway between hospital and community gyms	Mixed methods: data analysis, survey and semi-structured interview ($n=49$)	Structured exercise referral pathway to support transition between settings appears feasible and associated with patient satisfaction	Introductory sessions, direct referral, contact person important; importance of collaboration with QEPs;	1, 2
Sheill et al. 2022	Exercise for chronic conditions in community	Identify exercise barriers, facilitators, and needs of patients with chronic disease in community; provide recommendations for transition	Qualitative: focus groups with patients ($n=11$) and fitness instructors ($n=10$)	Need to improve referral and inductions processes for patients with chronic conditions; need for further professional training	Currently no standardised pathway to support patients; process for communication; suggestion for coordinator to oversee process	1, 2

Table 2 (continued)

Author(s) & year	Title*	Research aim(s)	Methodology & participants	Key findings	Salient points for this review	Relevant RQ(s)
Shore et al. 2021	Exercise Referral Instructors' perspectives	Explore exercise referral instructors' perceptions of motivating and supporting participants	Qualitative: exploratory study with semi-structured interviews ($n = 6$)	Four themes emerged related to instructors' role, techniques, perceptions of participants' views, and barriers	Provide clear information about ERS; mentoring and reassurance important	1, 2
Smock and Alemagno 2017	Barriers to Medical Fitness center Referral	Describe provider barriers to referring patients to MFCFs	Mixed methods: electronic survey ($n = 51$) and semi-structured interviews ($n = 25$)	Health care providers want clinical standard guidelines, protocol, and training to refer patients to MFCFs	Stronger links between healthcare system and MFCF can help promote prevention activities; need for communication; guidelines, time and awareness limit referral	1, 2
Wagoner et al. 2023	EXCEL study for rural cancer exercise access	Evaluate first-year reach, adoption, and implementation of EXCEL study	Mixed methods: evaluation using RE-AIM of online exercise program	Delivery and implementation of EXCEL considered feasible and safe, facilitated through HCP and QEP networks	"Hub and spoke" framework; online referral process; QEP network development	1

* Note: Titles are abbreviated for brevity; Abbreviations used in this table: ADT = androgen deprivation therapy; AEP(s) = accredited exercise physiologist(s); CASEM = Canadian Academy of Sport and Exercise Medicine; EP(s) = exercise professional(s); ERS = exercise referral scheme(s); EXCEL = exercise for cancer to enhance living well; ExRx = exercise prescription; GFP(s) = general practitioner(s); HCP(s) = healthcare professional(s); MDT = multidisciplinary team; MFCF(s) = medical fitness centre facilities; MS = multiple sclerosis; NCD = non-communicable disease; NERS = National Exercise Referral Scheme; OT(s) = occupational therapist(s); PA = physical activity; PAP = physical activity prescription; PARS = physical activity referral scheme(s); PD = Parkinson's Disease; PT(s) = physical therapist(s); QEP(s) = qualified exercise professional(s); RE-AIM = reach, effectiveness, adoption, implementation, maintenance; RQ(s) = research question(s); YACS = young adult cancer survivors

ability to provide PA counselling and prescribe exercise (Albert et al. 2020; Bray et al. 2023; Johnston et al. 2016; Dodd-Reynolds et al. 2020). This lack of confidence frequently stems from limited knowledge and awareness of available opportunities, resources, and referral processes (Albert et al. 2021a; Morgan et al. 2021; Bourke et al. 2018). HCPs' awareness of available programmes and resources is crucial for providing personalised referrals. To make an appropriate referral, a HCP must understand both the patient's needs and the specific assets of available programmes (Smock and Alemagno 2017). Both patients and HCPs recognise this awareness is essential for building the confidence necessary to make appropriately informed, personalised, referral decisions (Albert et al. 2021a). Scheme deliverers describe attempts to engage with referrers through awareness-raising activities, including initiatives to build familiarity and trust. Examples include accessible guidance for use and dissemination across practices (Morgan et al. 2021).

Trust and accountability HCPs are more likely to refer patients into ERS when they believe they are delivered by high-quality, qualified instructors (Buckley et al. 2018; Crozier et al. 2020). However, concerns about exercise professionals' lack of training and expertise specific to patients' needs limit HCP referrals (Buckley et al. 2018; Morgan et al. 2021). Additionally, HCPs express concerns about patient safety and the responsibility of "signing off" patients as safe to exercise, which deters some from making referrals (Crozier et al. 2020). It appears that many HCPs are unaware of the qualifications, such as NVQ3, that exercise professionals may hold (Bourke et al. 2018; Din et al. 2015).

Training to prescribe and promote PA Requests for additional training relating to exercise prescription and promotion and referral are commonly reported (Learmonth et al. 2018; Lion et al. 2019; Sheill et al. 2022). Effective training can increase perceived confidence and knowledge relating to exercise referral and promotion, therefore, increasing a HCPs ability to prescribe and promote exercise (Allin et al. 2023; Charles et al. 2022). Requests by HCPs for additional training to enhance knowledge of exercise promotion and referral are commonly reported (Learmonth et al. 2018; Lion et al. 2019; Sheill et al. 2022), suggesting that embedding training programmes may be a viable approach to increasing HCP confidence and ability to make accurate referrals into exercise.

Person-centred approaches

This theme explores how tailoring ERS to individual needs and circumstances can enhance its effectiveness, utilising a holistic, person-centred approach (Oliver et al. 2021; Abu-Omar et al. 2021; Buckley et al. 2018), focussing on three

key aspects: 1) socioeconomic characteristics and inequalities, 2) flexibility and adaptability, and 3) peer support initiatives.

Socioeconomic/individual characteristics The influence of socioeconomic and individual characteristics has been highlighted as influencing referral rates and outcomes in ERS. For example, HCPs report being more likely to refer females into ERS and consider socioeconomic status when making a referral (Buckley et al. 2018; Dodd-Reynolds et al. 2020; Garner-Purkis et al. 2020). Additionally, patients' social needs and interests play a significant role in the success of these PA schemes, particularly as promoting a sense of community and addressing loneliness and social isolation are commonly reported secondary outcomes (Crozier et al. 2020; Lion et al. 2019; Camhi et al. 2021). Therefore, an individual's cultural background and attitudes should be considered in the process to facilitate a successful referral (Johnston et al. 2016).

Flexibility and adaptability A flexible approach to exercise referrals can support effective implementation, engagement and adherence. A 'one size fits all' approach may not be appropriate (Hanson et al. 2019), particularly for patients who experience cyclical or changing needs (Oliver et al. 2021). For example, the timing and delivery of exercise is an important consideration to ensure best outcomes for a patient, such as cancer patients at different stages of treatment (Bourke et al. 2018; Nguyen et al. 2022), postnatal women (Allin et al. 2023) and those whose conditions may result in inconsistent needs (Hanson et al. 2019). The timing and location of programmes should be taken into consideration, as practical barriers, including transport, conflicting responsibilities and competing priorities, are commonly reported barriers to successful referral (Camhi et al. 2021; Morgan et al. 2021; Din et al. 2015; Smock and Alemagno 2017; Lion et al. 2019).

Self-referral Some health professionals suggest that self-referral (i.e. allowing a patient to refer themselves directly into an ERS) would serve as a time-saving alternative to additional health care appointments, which are currently required for access into many schemes (Din et al. 2015; Morgan et al. 2021; Portman et al. 2023). Self-referred participants have been perceived as more motivated and more likely to report positive behaviour change (Garner-Purkis et al. 2020), with research suggesting that incorporating flexible referral methods may improve programme accessibility (Portman et al. 2023).

Joined-up system

A key theme emerging from the literature is the need for a cohesive, interconnected system that can facilitate effective

exercise referral. This theme explores how various elements of the healthcare and PA systems can work together to create a more efficient and effective exercise referral process. Sub themes include; 1) stakeholder engagement, 2) bi-directional feedback and accountability, 3) centralised coordination, and 4) strategic buy-in.

Stakeholder engagement Co-designing exercise referral programmes allows for the distribution and allocation of resources to be considered, potentially leading to more sustainable, joined-up pathways (Buckley et al. 2018; Learmonth et al. 2018; Oliver et al. 2021). Therefore, identifying and engaging all relevant stakeholders (i.e., HCPs, exercise professionals, service users, public/private bodies) should be considered a fundamental principle in the design and delivery of exercise referral and prescription protocols to enhance systemic and strategic buy-in (Abu-Omar et al. 2021). Systemic and strategic buy-in, in which increased resources, subsidised costs, and financial incentives are prioritised, may be effective in creating sustainable approaches to exercise referral (McHale et al. 2020; Buckley et al. 2020; Nguyen et al. 2022). This approach ensures that awareness is distributed across all stakeholders and that all parties are confident in promoting and engaging in consistent practices (Albert et al. 2021b; Maiorana et al. 2018; Bray et al. 2023). By involving existing networks of HCPs, PA providers, and patients in the development process, co-production can lead to more effective and user-friendly referral systems (Buckley et al. 2018; McHale et al. 2020).

Processes and guidelines ERS have been viewed by some HCPs as an optional add-on rather than a standard treatment prescription, with some feeling it represents an additional burden on GPs, describing schemes as a 'nice to have service' (Buckley et al. 2020; Morgan et al. 2021). Structured processes and objective guidelines for exercise prescription and referral have been identified as an essential mechanism to facilitate and standardise the exercise referral process, leading to more appropriate and consistent referral rates (Borchers et al. 2019; Smock and Alemagno 2017; Learmonth et al. 2018; Nguyen et al. 2022).

Bi-directional communication Formal scheme feedback, including progress reports to HCPs, could facilitate understanding between exercise professionals and primary care teams to allow for more tailored support for patients (Morgan et al. 2021). Patients should be referred from a programme back to their HCPs if any symptoms or signs of disease emerge or worsen, and appropriate medical information shared to support patients safely (Maiorana et al. 2018; Sheill et al. 2022). Therefore, bi-directional communication between HCPs and exercise professionals has been identified as an important facilitator of successful referral

(Garner-Purkis et al. 2020). Communication challenges are reported between different sectors/services involved in exercise referral; for example, between acute hospital settings (Sheill et al. 2023), fitness/community facilities (Smock and Alemagno 2017) and specialist services (i.e., oncology, post-natal) (Wagoner et al. 2023; Allin et al. 2023).

Centralised coordination An approach that has proven successful in facilitating joined-up working is designating a specific person to manage referrals and signpost to specific initiatives, such as co-ordinators, care sport connectors and project support officers (Lion et al. 2019; Portman et al. 2023; Sheill et al. 2022). This centralised point of contact can help streamline the referral process and ensure consistent communication between different parts of the system (Bourke et al. 2018; Lion et al. 2019). When combined with self-referral options, this coordinated approach significantly reduces time pressures on HCPs, who commonly report time constraints as a major barrier to making referrals (Bray et al. 2023; Buckley et al. 2020; Din et al. 2015; Nguyen et al. 2022; Seth 2014; Smock and Alemagno 2017).

Discussion

This scoping review explored how HCPs collaborate with specialised PA programmes as part of ERS, and identified underlying mechanisms that facilitate or inhibit this process. While ERS have the potential to increase PA participation, their implementation remains inconsistent due to individual, structural, and systemic challenges. HCPs' confidence in referral processes emerged as a key factor influencing referral rates, with limited training and awareness of available programmes acting as barriers to engagement. Fragmented communication and a lack of standardised referral pathways limit the effectiveness of ERS. The importance of adopting a person-centred approach is also apparent, recognising that flexibility and adaptability in referral processes are necessary to meet divergent patient needs. Addressing these challenges requires enhanced interdisciplinary collaboration, structured referral processes, and increased integration of QEPs to ensure ERS are accessible, sustainable, and capable of supporting long-term PA behaviour change.

It is apparent HCPs play a critical role in referring individuals into ERS; however, confidence in referring into PA is a key barrier to this process (Bray et al. 2023). Part of this confidence stems from the individual traits of the HCP, with those who are younger or who regularly exercise themselves, more likely to refer into PA opportunities (Charles et al. 2022; Din et al. 2015; Morgan et al. 2021). However, confidence is not only influenced by personal characteristics, but also by the wider system. Poor knowledge and awareness of referral process and programmes (Albert et al.

2021a; Morgan et al. 2021; Bourke et al. 2018; Abu-Omar et al. 2021), unclear referral guidelines (Smock and Alemagno 2017), a lack of trust and accountability in those they are referring to (Crozier et al. 2020), and limited training in prescribing or promoting PA (Learmonth et al. 2018; Lion et al. 2019; Sheill et al. 2022), influence an individual's confidence to refer. Together, these individual and systemic factors lead to inconsistency in referral patterns across HCPs. The GAPP advocates for shifting focus from individual initiatives, to favouring system-based approaches that enable more cohesive, scalable, and context-sensitive approaches to PA promotion, implementing mechanisms that build confidence in referral pathways (WHO 2018). Therefore, a system-based approach to exercise referral would improve consistency in referral across HCPs and improve integration into broader healthcare and community services.

Whilst increasing HCP training has been proposed as a solution (Allin et al. 2023; Charles et al. 2022), practical constraints, such as time pressures and competing clinical priorities, make this challenging (Page et al. 2024). The UK primary-care workforce has limited capacity, with a need for policies that reduce workload to support more equitable care (Parisi et al. 2024). HCPs frequently report time constraints as a major barrier to referring patients to ERS. Centralised coordination can help alleviate this by reducing the administrative and decision-making burden on the individual HCP (Buckley et al. 2018; Morgan et al. 2021). Therefore, a more efficient approach to ERS would be to enhance awareness of exercise referral opportunities (Smock and Alemagno 2017), develop relationships with ERS professionals (Albert et al. 2022), and improve clarity in referral mechanisms (Learmonth et al. 2017). This could strengthen referral pathways and uptake of ERS without requiring HCPs to be extensively trained in prescribing PA, utilising those who already possess the required skills/training (i.e., QEPs), aligning with a systems-based approach to exercise referral (Public Health Scotland 2022; WHO 2022). Introducing a referral coordinator could be a practical solution to streamline the referral process and reduce the reliance on already overloaded HCPs (Lion et al. 2019; Portman et al. 2023). The introduction of a referral coordinator, similar to the link worker role in social prescribing, could act as a bridge between HCPs and QEPs within local exercise services (Polley and Sabey 2022). Just as link workers assess patients' non-medical needs and connect them with community resources (Bickerdike et al. 2017; Napierala et al. 2022; Pescheny et al. 2020), referral coordinators could streamline access to ERS by having knowledge of and directing patients to appropriate services, reducing the need for GPs to understand and explain specific scheme characteristics, thereby maximising consultation time (Borchers et al. 2019). Alongside this, digital referral tools and e-referral systems, accessible to all stakeholders, could further enhance efficiency by simplifying processes and improving uptake of

ERS (Buckley et al. 2020). These systems could support referral coordinators by providing a centralised platform for managing referrals, improving integration between stakeholders and ensuring that patients are directed to the most appropriate services. By shifting responsibility away from individual HCPs, a systems-based approach not only reduces pressure on the primary care workforce but also provides the foundation for a more joined-up system, embedding ERS into the wider healthcare and community system (Chada 2022; Gadsby and Wilding 2024).

A systems-based approach also plays a key role in ensuring ERS are embedded within a more joined-up system, strengthening connections between stakeholders (i.e., healthcare, leisure, community) and improving coordination across services, an essential component to facilitate a more interconnected and accessible referral process (Matheson et al. 2013; Public Health Scotland 2022). However, many ERS operate in isolation from healthcare systems, limiting opportunities for collaboration, which is essential for developing trust and facilitating bi-directional feedback between stakeholders (Maiorana et al. 2018). A more cohesive approach is needed to strengthen connections between HCPs and QEPs, helping to address concerns about the competency of those delivering ERS and provide reassurance around patient safety (Bray et al. 2023). As discussed, a dedicated referral coordinator may also help bridge the gap between HCPs and QEPs, strengthening their relationships, addressing concerns around competency and patient safety and improving continuity of care (Albert et al. 2022). By acting as a central point of contact, the coordinator could facilitate two-way communication, ensuring that HCPs receive feedback on referrals while QEPs better understand the needs of patients referred to them. In addition, digital referral systems could further enhance communication and transparency by enabling all stakeholders to access a central platform where patient progress can be monitored. This would not only improve continuity of care but also help build trust in the referral process, as HCPs would be able to monitor patient progress following the referral.

Taking a systems approach also involves co-designing ERS with relevant stakeholders, including HCPs, QEPs, and service users, to create sustainable, well-integrated pathways (Buckley et al. 2018; Oliver et al. 2021). Ensuring strategic buy-in and financial investment is crucial for integrating ERS into the wider system, embedding it more effectively within existing structures to enhance sustainability and preventing it from operating in isolation (Buckley et al. 2020; McHale et al. 2020). Additionally, structured communication pathways, such as feedback loops where HCPs receive updates on patient progress, can reinforce connections, increasing the likelihood of referral and participation (Albert et al. 2021a; Buckley et al. 2018). This approach remains effective even when HCPs lack direct PA training,

reinforcing that a systems-based model offers a more sustainable, equitable, and scalable approach to ERS, reducing the burden on individual HCPs and limiting their role as gatekeepers to the service (Gadsby and Wilding 2024).

While system-level changes are necessary, equitable access must also be considered in how HCPs collaborate with specialised PA programmes. As discussed, ERS often rely on HCPs to refer individuals into the service, creating a gatekeeper that can restrict access, uptake, and sustained engagement with PA. Self-referral has been suggested as one approach to increasing individual agency in care, improving access by removing a bottleneck to participation, and reducing the time constraints on already overloaded HCPs (Din et al. 2015; Morgan et al. 2021; Portman et al. 2023). Additionally, self-referral may enhance ERS effectiveness, as patients who self-refer are perceived to be more motivated and more likely to sustain long-term PA behaviour change (Garner-Purkis et al. 2020). It also has the potential to reduce bias in the referral process, as factors such as gender and socioeconomic status may influence HCP referral behaviour (Buckley et al. 2018; Dodd-Reynolds et al. 2020; Garner-Purkis et al. 2020).

However, a 'one-size-fits-all' approach is not appropriate, and self-referral alone is not sufficient to cater for varying individual needs and levels of motivation (Hanson et al. 2019). Instead, ERS should adopt a person-centred, holistic model that provides flexible referral pathways adaptable to individual needs. Some individuals, particularly those managing complex health conditions (e.g., cyclical, changing, or inconsistent needs) (Oliver et al. 2021) or facing additional challenges (e.g., transport issues, conflicting responsibilities, competing priorities, or time constraints) (Lion et al. 2019), may require alternative referral options and additional support to engage with ERS (Albert et al. 2022). This support may include referrals from HCPs, structured referral frameworks, or the ability to self-refer (Camhi et al. 2021; Din et al. 2015; Morgan et al. 2021; Smock and Alemagno 2017; Hanson et al. 2019; Oliver et al. 2021).

ERS are often designed to support individuals with an existing condition (e.g., type 2 diabetes, hypertension) or following an acute event (e.g., myocardial infarction, stroke) (Rowley et al. 2018; Taylor et al. 2020), rather than proactively engaging those at risk of developing chronic conditions or future adverse health events. As healthcare systems increasingly shift toward preventative models of care (NHS England 2019), ERS must adopt flexible and inclusive designs to ensure equitable access for a broader range of individuals who could benefit from them.

As identified, referral coordinators could play a key role in facilitating these different referral mechanisms, connecting stakeholders and ensuring appropriate, context-specific support. ERS should also recognise the wider benefits of participation, including social engagement and

community connection, and provide a holistic approach that supports both physical and mental well-being (Camhi et al. 2021; Crozier et al. 2020; Lion et al. 2019). By accounting for these broader outcomes and reconceptualising referral pathways as a dynamic and interconnected network, accessibility and sustained engagement in exercise referral would be improved. Additionally, flexible and equitable referral processes are essential within this to address inconsistencies in access to ERS (e.g., gender, socioeconomic status, geographic location), supporting engagement, and increasing the likelihood of long-term behaviour change.

Limitations

This review provides insights into the mechanisms that support collaboration between HCPs and specialised PA providers in ERS; however, several limitations should be acknowledged. The exclusion of non-English studies and grey literature may have limited the diversity of perspectives, potentially underrepresenting certain healthcare systems and regional practices. Expanding the scope of future research could provide a broader understanding of the underlying mechanism of ERS implementation. Additionally, as this review focuses on mechanisms influencing collaboration, it does not establish causal links between referral processes and long-term PA adherence, highlighting the need for further research on the effectiveness of different referral models. Finally, as the included studies span 2013 to 2023, evolving policy and funding environments may shape ERS design, requiring ongoing evaluation to ensure schemes remain effective, equitable, and sustainable.

Recommendations for policy and practice

Based on the findings of this review, recommendations are made to enhance the effectiveness and sustainability of implementing and delivering ERS:

1. **ERS should take a systems-based approach.** ERS should move away from operating as isolated schemes and instead be embedded within broader healthcare and community systems. Strengthening integration across sectors would improve coordination, reduce fragmentation, and ensure ERS are a sustainable, long-term solution.
2. **Introduce referral coordinators.** A dedicated referral coordinator role should be established to strengthen relationships between HCPs, PA providers, and service users. This would enhance trust, increase awareness of ERS, and support structured feedback mechanisms, improving the overall referral process. A centralised, digital communication system alongside this, would

facilitate efficient referral processes, track patient progress, and improve bi-directional communication between stakeholders.

3. **Building confidence in exercise referral through inclusive and equitable practice.** Efforts to embed ERS into routine practice should focus on increasing awareness and confidence across the system. Standardising referral processes and ensuring clarity and confidence in referral criteria can reduce variability in practice and support more consistent and appropriate referrals. Improving communication between stakeholders and embedding clear, structured decision-making processes helps ensure that referrals are not influenced by individual biases. In doing so, ERS can support more equitable and inclusive access, be responsive to diverse needs, and benefit a broader range of individuals.

Conclusion

The findings of this review highlight the need to move beyond viewing ERS as a linear referral pathway and instead conceptualise it as a dynamic, interconnected network embedded within the wider system (i.e., healthcare, leisure, community). Strengthening integration, supported by referral coordinators, structured processes, and communication systems (i.e., digital), would improve accessibility, consistency, and long-term sustainability. Ongoing collaboration, stakeholder engagement, and feedback mechanisms are essential to building and maintaining trust, increasing awareness, and ensuring referral pathways remain both active and effective. Addressing the mechanisms that support and challenge collaboration between HCPs and PA providers will help inform the development of more integrated, context-sensitive approaches to embedding PA within healthcare and the wider community. A more connected and adaptive approach to ERS can better support diverse needs, reduce inequalities, and facilitate sustained long-term PA behaviour change.

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1007/s10389-025-02593-z>.

Acknowledgements The authors would like to acknowledge the support of NHS Norfolk and Waveney ICB, who provided Research Capability Funding for this work.

Funding This work was supported by Research Capability Funding from NHS Norfolk and Waveney ICB.

Data availability Not applicable.

Code availability Not applicable.

Declarations

Ethics approval Not applicable; the review involved the analysis of published literature only.

Consent Not applicable.

Competing interests There are no conflicts to declare.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

References

- Abu-Omar K, Weissenfels A, Mino E, Naber I, Klamroth S, Geidl W, Pfeifer K (2021) Coproduction to improve preventive health services-experiences from Germany. *Health Promot Int* 36:ii107–ii113. <https://doi.org/10.1093/heapro/daab162>
- Albert FA, Crowe MJ, Malau-Aduli AEO, Malau-Aduli BS (2020) Functionality of physical activity referral schemes (PARS): a systematic review. *Front Public Health* 8:257. <https://doi.org/10.3389/fpubh.2020.00257>
- Albert FA, Malau-Aduli AEO, Crowe MJ, Malau-Aduli BS (2021a) Australian patients' perception of the efficacy of the physical activity referral scheme (PARS). *Patient Educ Couns* 104(11):2803–2813. <https://doi.org/10.1016/j.pec.2021.04.001>
- Albert FA, Malau-Aduli AEO, Crowe MJ, Malau-Aduli BS (2021b) The “PRICE” of physical activity referral schemes (PARS): stakeholders' recommendations for delivering quality care to patients. *Int J Environ Res Public Health* 18(16):8627. <https://doi.org/10.3390/ijerph18168627>
- Albert FA, Malau-Aduli AEO, Crowe MJ, Malau-Aduli BS (2022) Optimising care coordination strategies for physical activity referral scheme patients by Australian health professionals. *PLoS ONE* 17(7):e0270408. <https://doi.org/10.1371/journal.pone.0270408>
- Allin L, Haighton C, Dalkin S, Das J, Allen G (2023) Understanding the challenges and impact of training on referral of postnatal women to a community physical activity programme by health professionals: a qualitative study using the COM-B model. *Midwifery* 116:103516. <https://doi.org/10.1016/j.midw.2022.103516>
- Anokye NK, Trueman P, Green C, Pavey TG, Hillsdon M, Taylor RS (2011) The cost-effectiveness of exercise referral schemes. *BMC Public Health* 11(1):954. <https://doi.org/10.1186/1471-2458-11-954>
- Arksey H, O'Malley L (2005) Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 8(1):19–32. <https://doi.org/10.1080/1364557032000119616>
- Below N, Fisher A, Epstone S, Reynolds J, Pugh G (2021) Young adult cancer survivors' experience of taking part in a 12-week exercise referral programme: a qualitative study of the Trekstock RENEW initiative. *Support Care Cancer* 29(5):2613–2620. <https://doi.org/10.1007/s00520-020-05746-w>

- Bickerdike L, Booth A, Wilson PM, Farley K, Wright K (2017) Social prescribing: less rhetoric and more reality. A systematic review of the evidence. *BMJ Open* 7(4):e013384. <https://doi.org/10.1136/bmjopen-2016-013384>
- Borchers EE, McIsaac TL, Bazan-Wigle JK, Elkins AJ, Bay RC, Farley BG (2019) A physical therapy decision-making tool for stratifying persons with Parkinson's disease into community exercise classes. *Neurodegener Dis Manag* 9(6):331–346. <https://doi.org/10.2217/nmt-2019-0019>
- Bourke L, Turner R, Greasley R, Sutton E, Steed L, Smith D, Brown J, Kelly B, Hulme C, Greenfield D, Persad R, Farrin A, Hewison J, Rosario DJ (2018) A multi-centre investigation of delivering national guidelines on exercise training for men with advanced prostate cancer undergoing androgen deprivation therapy in the UK NHS. *PLoS ONE* 13(7):e0197606. <https://doi.org/10.1371/journal.pone.0197606>
- Bourke A, Niranjan V, O'Connor R, Woods C (2022) Barriers to and motives for engagement in an exercise-based cardiac rehabilitation programme in Ireland: a qualitative study. *BMC Prim Care* 23(1):28. <https://doi.org/10.1186/s12875-022-01637-7>
- Bray NW, O'Brien MW, Wong MY, Sui W, Voss ML, Turnbull N, Nagpal TS, Fowles JR (2023) The importance of collaboration between medical and exercise professionals in addressing patient physical inactivity. *Appl Physiol Nutr Metab* 48(1):88–90. <https://doi.org/10.1139/apnm-2022-0312>
- Buckley BJR, Thijssen DHJ, Murphy RC, Graves LEF, Whyte G, Gillison FB, Crone D, Wilson PM, Watson PM (2018) Making a move in exercise referral: co-development of a physical activity referral scheme. *J Public Health (Oxf)* 40(4):e586–e593. <https://doi.org/10.1093/pubmed/fdy072>
- Buckley BJR, Finnie SJ, Murphy RC, Watson PM (2020) "You've Got to Pick Your Battles": a mixed-methods investigation of physical activity counselling and referral within general practice. *Int J Environ Res Public Health* 17(20):7428. <https://doi.org/10.3390/ijerph17207428>
- Camhi SM, Debordes-Jackson G, Andrews J, Wright J, Lindsay AC, Troped PJ, Hayman LL (2021) Socioecological factors associated with an urban exercise prescription program for under-resourced women: a mixed methods community-engaged research project. *Int J Environ Res Public Health* 18(20):8726. <https://doi.org/10.3390/ijerph18168726>
- Campbell F, Holmes M, Everson-Hock E, Davis S, Buckley Woods H, Anokye N, Tappenden P, Kaltenthaler E (2015) A systematic review and economic evaluation of exercise referral schemes in primary care: a short report. *Health Technol Assess (Winchester, England)* 19(60):1–110. <https://doi.org/10.3310/hta19600>
- Carstairs SA, Rogowsky RH, Cunningham KB, Sullivan F, Ozakinci G (2020) Connecting primary care patients to community-based physical activity: a qualitative study of health professional and patient views. *BJGP Open*. <https://doi.org/10.3399/bjgpopen20X101100>
- Chada BV (2022) The systems engineering approach to quality improvement in the NHS. *Future Healthc J* 9(3):330–332. <https://doi.org/10.7861/fhj.2022-0016>
- Charles M, Ouchchane L, Thivel D, Celine L, Duclos M (2022) Does legislative framework favors prescription of physical activity in primary care? The French experience. *Phys Sportsmed* 50(1):47–53. <https://doi.org/10.1080/00913847.2020.1864676>
- Chatterjee R, Chapman T, Brannan MG, Varney J (2017) GPs' knowledge, use, and confidence in national physical activity and health guidelines and tools: a questionnaire-based survey of general practice in England. *Br J Gen Pract* 67(663):e668–e675. <https://doi.org/10.3399/bjgp17X692513>
- Chatterjee HJ, Camic PM, Lockyer B, Thomson LJM (2018) Non-clinical community interventions: a systematised review of social prescribing schemes. *Arts Health* 10(2):97–123. <https://doi.org/10.1080/17533015.2017.1334002>
- Cheema BS, Robergs RA, Askew CD (2014) Exercise physiologists emerge as allied healthcare professionals in the era of non-communicable disease pandemics: a report from Australia, 2006–2012. *Sports Med* 44(7):869–877. <https://doi.org/10.1007/s40279-014-0173-y>
- Crozier A, Porcellato L, Buckley BJR, Watson PM (2020) Facilitators and challenges in delivering a peer-support physical activity intervention for older adults: a qualitative study with multiple stakeholders. *BMC Public Health* 20(1):1904. <https://doi.org/10.1186/s12889-020-09990-x>
- Din NU, Moore GF, Murphy S, Wilkinson C, Williams NH (2015) Health professionals' perspectives on exercise referral and physical activity promotion in primary care: findings from a process evaluation of the National Exercise Referral Scheme in Wales. *Health Educ J* 74(6):743–757. <https://doi.org/10.1177/0017896914559785>
- Dodd-Reynolds CJ, Vallis D, Kasim A, Akhter N, Hanson CL (2020) The northumberland exercise referral scheme as a universal community weight management programme: a mixed methods exploration of outcomes, expectations and experiences across a social gradient. *Int J Environ Res Public Health* 17(15):5297. <https://doi.org/10.3390/ijerph17155297>
- Downey J, Shearn K, Brown N, Wadey R, Breckon J (2021) Behaviour change practices in exercise referral schemes: developing realist programme theory of implementation. *BMC Health Serv Res* 21(1):335. <https://doi.org/10.1186/s12913-021-06349-9>
- Dunphy R, Blane DN (2024) Understanding exercise referrals in primary care: a qualitative study of general practitioners and physiotherapists. *Physiotherapy* 124:1–8. <https://doi.org/10.1016/j.physio.2024.04.348>
- Elliott M, Davies M, Davies J, Wallace C (2022) Exploring how and why social prescribing evaluations work: a realist review. *BMJ Open* 12(4):e057009. <https://doi.org/10.1136/bmjopen-2021-057009>
- Gadsby EW, Wilding H (2024) Systems thinking in, and for, public health: a call for a broader path. *Health Promot Int* 39(4):daae086. <https://doi.org/10.1093/heapro/daae086>
- Garner-Purkis A, Alageel S, Burgess C, Gulliford M (2020) A community-based, sport-led programme to increase physical activity in an area of deprivation: a qualitative case study. *BMC Public Health* 20(1):1018. <https://doi.org/10.1186/s12889-020-08661-1>
- Hanson CL, Oliver EJ, Dodd-Reynolds CJ, Allin LJ (2019) How do participant experiences and characteristics influence engagement in exercise referral? A qualitative longitudinal study of a scheme in Northumberland, UK. *BMJ Open* 9(2):e024370. <https://doi.org/10.1136/bmjopen-2018-024370>
- Husk K, Blockley K, Lovell R, Bethel A, Lang I, Byng R, Garside R (2020) What approaches to social prescribing work, for whom, and in what circumstances? A realist review. *Health Soc Care Community* 28(2):309–324. <https://doi.org/10.1111/hsc.12839>
- Inkpen SJL, Liu H, Rayner S, Shields E, Godin J, O'Brien MW (2024) Exercise referral schemes increase patients' cardiorespiratory endurance: a systematic review and meta-analysis. *Prev Med Rep* 45:102844. <https://doi.org/10.1016/j.pmedr.2024.102844>
- Johnston CL, Maxwell LJ, Alison JA (2016) Establishing and delivering pulmonary rehabilitation in rural and remote settings: The opinions, attitudes and concerns of health care professionals. *Aust J Rural Health* 24 (2):106–114. <https://doi.org/10.1111/ajr.12202>
- Learmonth YC, Adamson BC, Balto JM, Chiu CY, Molina-Guzman I, Finlayson M, Riskin BJ, Motl RW (2017) Multiple sclerosis patients need and want information on exercise promotion from healthcare providers: a qualitative study. *Health Expect* 20(4):574–583. <https://doi.org/10.1111/hex.12482>

- Learmonth YC, Adamson BC, Balto JM, Chiu CY, Molina-Guzman IM, Finlayson M, Barstow EA, Motl RW (2018) Investigating the needs and wants of healthcare providers for promoting exercise in persons with multiple sclerosis: a qualitative study. *Disabil Rehabil* 40(18):2172–2180. <https://doi.org/10.1080/09638288.2017.1327989>
- Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT, Lancet Physical Activity Series Working G (2012) Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *Lancet* 380(9838):219–229. [https://doi.org/10.1016/S0140-6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)
- Levac D, Colquhoun H, O'Brien KK (2010) Scoping studies: advancing the methodology. *Implement Sci* 5(1):69. <https://doi.org/10.1186/1748-5908-5-69>
- Lion A, Vuillemin A, Thornton JS, Theisen D, Stranges S, Ward M (2019) Physical activity promotion in primary care: a Utopian quest? *Health Promot Int* 34(4):877–886. <https://doi.org/10.1093/heapro/day038>
- Maiorana A, Levinger I, Davison K, Smart N, Coombes J (2018) Exercise prescription is not just for medical doctors: the benefits of shared care by physicians and exercise professionals. *Br J Sports Med* 52(13):879–880. <https://doi.org/10.1136/bjsports-2016-096994>
- Matheson GO, Klügl M, Engebretsen L, Bendiksen F, Blair SN, Börjesson M, Budgett R, Derman W, Erdener U, Ioannidis JP, Khan KM, Martinez R, Van Mechelen W, Mountjoy M, Sallis RE, Schwellnus M, Shultz R, Soligard T, Steffen K, Sundberg CJ, Weiler R, Ljungqvist A (2013) Prevention and management of non-communicable disease: the IOC consensus statement, Lausanne 2013. *Br J Sports Med* 47(16):1003–1011. <https://doi.org/10.1136/bjsports-2013-093034>
- McHale S, Pearsons A, Neubeck L, Hanson CL (2020) Green health partnerships in Scotland; pathways for social prescribing and physical activity referral. *Int J Environ Res Public Health* 17(18):6832. <https://doi.org/10.3390/ijerph17186832>
- McHugh ML (2012) Interrater reliability: the kappa statistic. *Biochem Med Zagreb* 22(3):276–282
- Morgan K, Lewis J, Hawkins J, Moore G (2021) From a research trial to routine practice: stakeholders' perceptions and experiences of referrals to the National Exercise Referral Scheme (NERS) in Wales. *BMC Health Serv Res* 21(1):1232. <https://doi.org/10.1186/s12913-021-07266-7>
- Napierala H, Kruger K, Kuschick D, Heintze C, Herrmann WJ, Holzinger F (2022) Social prescribing: systematic review of the effectiveness of psychosocial community referral interventions in primary care. *Int J Integr Care* 22(3):11. <https://doi.org/10.5334/ijic.6472>
- Netherway J, Smith B, Monforte J (2021) Training healthcare professionals on how to promote physical activity in the UK: a scoping review of current trends and future opportunities. *Int J Environ Res Public Health* 18(13):6701. <https://doi.org/10.3390/ijerph18136701>
- Nguyen JM, Rotonda C, Gendarme S, Martin-Krumm C, Omorou YA, Van Hove A (2022) Oncology health professionals' perspectives of determinants of exercise by cancer patients: a socio-ecological approach. *Eur J Oncol Nurs*. <https://doi.org/10.1016/j.ejon.2022.102234>
- NHS England (2019) The NHS Long Term Plan. <https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf>. Accessed 10 April 2025
- NICE (2014) Physical Activity: exercise referral schemes. National Institute for Health and Care Excellence (NICE), London. <https://www.nice.org.uk/guidance/ph54>. Accessed 6 June 2025
- O'Brien MW, Bray NW, Kivell MJ, Fowles JR (2021) A scoping review of exercise referral schemes involving qualified exercise professionals in primary health care. *Appl Physiol Nutr Metab* 46(9):1007–1018. <https://doi.org/10.1139/apnm-2020-1070>
- Oliver EJ, Dodd-Reynolds C, Kasim A, Vallis D (2021) Inequalities and inclusion in exercise referral schemes: a mixed-method multi-scheme analysis. *Int J Environ Res Public Health* 18(6):3033. <https://doi.org/10.3390/ijerph18063033>
- Page B, Irving D, Amalberti R, Vincent C (2024) Health services under pressure: a scoping review and development of a taxonomy of adaptive strategies. *BMJ Qual Saf* 33(11):738–747. <https://doi.org/10.1136/bmjqs-2023-016686>
- Parisi R, Lau YS, Bower P, Checkland K, Rubery J, Sutton M, Giles S, Esmail A, Spooner S, Kontopantelis E (2024) GP working time and supply and patient demand in England in 2015–2022: a retrospective study. *Br J Gen Pract* 74(747):e666–e673. <https://doi.org/10.3399/BJGP.2024.0075>
- Pavey TG, Taylor AH, Fox KR, Hillsdon M, Anokye N, Campbell JL, Foster C, Green C, Moxham T, Mutrie N, Searle J, Trueman P, Taylor RS (2011) Effect of exercise referral schemes in primary care on physical activity and improving health outcomes: systematic review and meta-analysis. *BMJ* 343:d6462. <https://doi.org/10.1136/bmj.d6462>
- Peschery JV, Randhawa G, Pappas Y (2020) The impact of social prescribing services on service users: a systematic review of the evidence. *Eur J Public Health* 30(4):664–673. <https://doi.org/10.1093/eurpub/ckz078>
- Polley M, Sabey A (2022) An evidence review of social prescribing and physical activity. NASP, London. (https://socialprescribingacademy.org.uk/media/udfpf5o3/review-of-social-prescribing-and-physical-activity_.pdf). Accessed 6 June 2025
- Pollock D, Peters MDJ, Khalil H, McInerney P, Alexander L, Tricco AC, Evans C, de Moraes EB, Godfrey CM, Pieper D, Saran A, Stern C, Munn Z (2023) Recommendations for the extraction, analysis, and presentation of results in scoping reviews. *JBI Evid Synth* 21(3):520–532. <https://doi.org/10.11124/JBIES-22-00123>
- Portman RM, Levy AR, Allen SF, Fairclough SJ (2023) Exercise referral scheme participant characteristics, referral mode and completion status. *Health Educ J* 82(3):311–323. <https://doi.org/10.1177/00178969231156108>
- Public Health Scotland (2022) Physical activity referral standards. Public Health Scotland, Edinburgh. <https://publichealthscotland.scot/media/11345/physical-activity-referral-standards.pdf>. Accessed 6 June 2025
- Pum J (2019) Chapter six — a practical guide to validation and verification of analytical methods in the clinical laboratory. In: Makowski GS (ed) *Advances in Clinical Chemistry*, vol 90. Elsevier, Amsterdam, pp 215–281. <https://doi.org/10.1016/bs.acc.2019.01.006>
- Rowley N, Mann S, Steele J, Horton E, Jimenez A (2018) The effects of exercise referral schemes in the United Kingdom in those with cardiovascular, mental health, and musculoskeletal disorders: a preliminary systematic review. *BMC Public Health* 18(1):949. <https://doi.org/10.1186/s12889-018-5868-9>
- Santos AC, Willumsen J, Meheus F, Ilbawi A, Bull FC (2023) The cost of inaction on physical inactivity to public health-care systems: a population-attributable fraction analysis. *Lancet Glob Health* 11(1):e32–e39. [https://doi.org/10.1016/S2214-109X\(22\)00464-8](https://doi.org/10.1016/S2214-109X(22)00464-8)
- Seth A (2014) Exercise prescription: what does it mean for primary care? *Br J Gen Pract* 64(618):12–13. <https://doi.org/10.3399/bjgp14X676294>
- Sheill G, Hennessy M, Neill LO, Reynolds S, Towns J, Gill M, Guinan E (2022) Exercise and chronic health conditions in the community: a qualitative study of patients and fitness instructors. *Health Soc Care Community* 30(3):1025–1034. <https://doi.org/10.1111/hsc.13288>
- Sheill G, Hennessy M, Devenney K, Reynolds S, Towns J, Gill M, Guinan E (2023) A hospital to community exercise referral

- pathway: results of a pilot project. *Ir J Med Sci* 192(5):2051–2058. <https://doi.org/10.1007/s11845-022-03257-7>
- Shore CB, Galloway SDR, Gorely T, Hunter AM, Hubbard G (2021) Exercise referral instructors' perspectives on supporting and motivating participants to uptake, attend and adhere to exercise prescription: a qualitative study. *Int J Environ Res Public Health* 19(1). <https://doi.org/10.3390/ijerph19010203>
- Smock C, Alemagno S (2017) Understanding health care provider barriers to hospital affiliated medical fitness center facility referral: a questionnaire survey and semi structured interviews. *BMC Health Serv Res* 17(1):520. <https://doi.org/10.1186/s12913-017-2474-y>
- Speake H, Copeland RJ, Till SH, Breckon JD, Haake S, Hart O (2016) Embedding physical activity in the heart of the NHS: the need for a whole-system approach. *Sports Med* 46(7):939–946. <https://doi.org/10.1007/s40279-016-0488-y>
- Taylor AH, Taylor RS, Ingram WM, Anokye N, Dean S, Jolly K, Mutrie N, Lambert J, Yardley L, Greaves C, King J, McAdam C, Steele M, Price L, Streeter A, Charles N, Terry R, Webb D, Campbell J, Hughes L, Ainsworth B, Jones B, Jane B, Erwin J, Little P, Woolf A, Cavanagh C (2020) Adding web-based behavioural support to exercise referral schemes for inactive adults with chronic health conditions: the e-coachER RCT. *Health Technol Assess* 24(63):1–106. <https://doi.org/10.3310/hta24630>
- Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, Moher D, Peters MDJ, Horsley T, Weeks L, Hempel S, Akl EA, Chang C, McGowan J, Stewart L, Hartling L, Aldcroft A, Wilson MG, Garrity C, Lewin S, Godfrey CM, Macdonald MT, Langlois EV, Soares-Weiser K, Moriarty J, Clifford T, Tuncalp O, Straus SE (2018) PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 169(7):467–473. <https://doi.org/10.7326/M18-0850>
- Wagoner CW, Dreger J, Keats MR, Santa Mina D, McNeely ML, Cuthbert C, Capozzi LC, Francis GJ, Trinh L, Sibley D, Langley J, Chiekwe J, Ester M, Foucaut AM, Culos-Reed SN (2023) First-year implementation of the EXercise for Cancer to Enhance Living Well (EXCEL) study: building networks to support rural and remote community access to exercise oncology resources. *Int J Environ Res Public Health*. <https://doi.org/10.3390/ijerph20031930>
- Weiler R, Chew S, Coombs N, Hamer M, Stamatakis E (2012) Physical activity education in the undergraduate curricula of all UK medical schools: are tomorrow's doctors equipped to follow clinical guidelines? *Br J Sports Med* 46(14):1024–1026. <https://doi.org/10.1136/bjsports-2012-091380>
- Werbrouck A, Schmidt M, Putman K, Seghers J, Simoens S, Verhaeghe N, Annemans L (2022) Cost-effectiveness of exercise referral schemes: a systematic review of health economic studies. *Eur J Public Health* 32(1):87–94. <https://doi.org/10.1093/eurpub/ckab189>
- WHO (2018) World Health Organization (WHO). Global action plan on physical activity 2018–2030: more active people for a healthier world. WHO, Geneva. <https://iris.who.int/bitstream/handle/10665/272722/9789241514187-eng.pdf>. Accessed 6 June 2025
- WHO (2022) World Health Organization (WHO). Global status report on physical activity 2022. WHO, Geneva. <https://www.who.int/teams/health-promotion/physical-activity/global-status-report-on-physical-activity-2022>. Accessed 6 June 2025
- Williams NH, Hendry M, France B, Lewis R, Wilkinson C (2007) Effectiveness of exercise-referral schemes to promote physical activity in adults: systematic review. *Br J Gen Pract* 57(545):979–986. <https://doi.org/10.3399/096016407782604866>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.