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The allied health professions and health promotion: a systematic literature review and narrative synthesis

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Glossary of terms/abbreviations

ADL	activities of daily living
AHP	allied health profession/professional
CASP	Critical Appraisal Skills Programme
CBT	Cognitive Behavioural Therapy
CCT	controlled clinical trial
CHPPHF	Cochrane Health Promotion and Public Health Field
CPD	continuing professional development
DH	Department of Health
HP	health promotion
HPC	Health Professions Council
ICER	incremental cost-effectiveness ratio
MDT	multi-disciplinary team
OT	occupational therapy/therapist
PH	public health
PT	physiotherapy/physiotherapist
QALY	quality-adjusted life year
QoL	quality of life
RCT	randomized controlled trial
SLT	speech and language therapy/therapist
VAS	visual analogue scale

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Contributions of authors

Justin Needle (Lecturer in Health Services Research & Policy) was responsible for operational management of the project and had lead responsibility for data management (using EPPI-Reviewer), design and execution of the literature search, preparation of data extraction and critical appraisal instruments, and retrieval of full-text studies. He also liaised with AHP professional and other relevant organisations and individuals. He was jointly responsible, with Roland Petchey, for writing the final report.

Roland Petchey (Professor of Health Services Research & Policy, and PI) was responsible for strategic management of project, and jointly responsible for design and execution of literature review, and preparation of evaluation and data extraction instruments. He undertook hand searches of key journals and data extraction and critical appraisal of studies meeting the review inclusion criteria. He was jointly responsible, with Justin Needle, for writing the final report.

Julie Benson (Research Assistant, health promotion) assisted in reference screening, initial study assessment, retrieval of full-text studies and hand searching of key journals. She independently double-checked the data extractions and critical appraisals carried out by other members of the review team. She also contributed to the writing of the final report (Background chapter).

Angela Scriven (Reader in Health Promotion), John Lawrenson (Professor of Clinical Optometry) and Katerina Hilari (Senior Lecturer, Speech & Language Therapy) undertook data extraction and critical appraisal of studies meeting the review inclusion criteria.

All authors contributed to the design of the study, attended Project Team meetings and provided advice throughout the project.

Executive Summary

Background

Over 75,000 allied health professionals (AHPs) work in the English NHS, comprising:

- arts therapists
- chiropodists/podiatrists
- dietitians
- occupational therapists
- orthoptists
- paramedics
- physiotherapists
- prosthetists/orthotists
- radiographers
- speech and language therapists

They have been encouraged to work more flexibly, and develop extended roles across professional and organisational boundaries. This new agenda requires them to promote health and wellbeing, to educate patients, carers and other professionals, and to view every patient contact as an opportunity for health promotion (HP). It is thought, however, that their HP potential has been unrealised, with their role limited to working with patients to alleviate the effects of illness or disability rather than promoting health and wellbeing in the population in general. Furthermore, relatively little is currently known about the roles they play in public health and HP.

Aims

To evaluate the evidence relating to the current role of UK-based AHPs (including optometrists) in HP.

Methods

We undertook a systematic review of the UK literature on AHPs and HP for the period 2000 to 2008. Studies were quality assessed, and data extracted using a variety of validated tools. Data from the studies were subjected to narrative synthesis, focusing on subjects and conditions, settings and levels of interventions, styles of AHP working, relationships with other professions, approaches to health promotion and research.

Results

We searched 33 electronic databases and hand searched 15 AHP-specific journals. This generated 71,236 abstracts (44,772 after de-duplication), of

which 43,275 were rejected. The full text of 1,497 articles was retrieved, of which 141 were finally included.

Overall profile¹

Randomised Controlled Trials (RCTs) (45%) and Controlled Clinical Trials (CCTs) (12%) accounted for half, followed by Before and after studies (33%) and qualitative studies (10%). Economic evaluations (5%) were uncommon. Studies were of poor quality overall, with 6% rated 'Strong', 23% 'Moderate' and 72% 'Poor.'

Hospital settings predominated (50%), followed by primary care (17%) and community sites (11%). Main professional collaborators were doctors (26%), nurses (23%), and psychologists (12%). Non-clinical collaborations (e.g. social workers, teachers) were rare.

The main conditions targeted were: musculoskeletal disorders (28%), cancers (20%), and obesity (11%). Main outcomes were: Quality of Life (26%), behaviour (28%), self management skills (22%) and knowledge (15%).

62% of interventions were at Tertiary, 40% at Secondary, 8% at Primary and 3% at Quaternary level. The approach was overwhelmingly individualistic, with individual empowerment (75%) and education (57%) predominating. Community development interventions were uncommon (1%). Small group working (45%) just exceeded one-to-one delivery (44%). However, group working was generally adopted for reasons of administrative convenience or efficiency. Rarely was it an integral component of the intervention (e.g. to reduce social isolation or stigma).

Profession-specific results

Physiotherapists constitute 29% of AHPs, so with 72 (51%) studies, were significantly over-represented. Main conditions targeted were back and neck pain (28%), arthritis/rheumatic disorder (14%), chronic pain, fibromyalgia and chronic fatigue syndrome (10%). Interventions consisted mainly of individualistic advice- and information-giving. 65% were at tertiary, 31% at secondary, 3% at quaternary and just 1% at primary level. Hospital settings (61%) predominated, followed by primary care, and community settings (12% each). 67% of studies were CCTs, Before and After studies (24%), Qualitative designs (8%) and Other (3%). 6% were rated 'Strong', 36% 'Moderate' and 58% 'Weak'. In hospital settings the biomedical model of research appeared to predominate, however a qualitative tradition may be emerging elsewhere.

Dietitians constitute just 5% of AHPs, so with 42 (30%) studies, were also over-represented. Diabetes (25%) was the main condition targeted, then obesity (21%) and dialysis patients (17%). Interventions were largely at Secondary (36%) or Tertiary (55%) levels. The majority targeted adults,

¹ Some percentages may sum to more than 100 due to multiple responses.

typically having highly specific nutritional needs caused by an existing condition (such as diabetes or renal failure). Clinical settings predominated, with hospital and primary care accounting for 72% of interventions. Few interventions took place in schools (7%). Although 17% took place in community settings, only one adopted a community development approach. Otherwise, they consisted of individualistic information and advice giving and/or behavioural interventions. Few were targeted at improving the diet of healthy individuals or communities. The biomedical paradigm predominated; 52% of studies were RCTs, followed by Before and after (36%), and Others (12%). One (3%) was rated as 'Strong', four (12%) as 'Moderate' and the remainder as 'Weak'.

Occupational therapists constitute 20% of AHPs, and contributed 28 (20%) studies. Chronic conditions predominated: mental health (32%), arthritis (21%) and pain and fatigue (18%). Subjects ranged from adolescents through to older people, and including informal carers. Settings included acute trusts, residential and domestic home settings, and a rural 'Outward Bound' style camp. Interventions also varied, from a brief education initiative to reduce anxiety among patients about to undergo hip replacement surgery, to life skills programmes for people with severe mental health conditions. 11 studies (39%) were Before and after, 9 (32%) RCTs and 6 (21%) included a qualitative element. Qualitative studies were more likely to be in community settings. 17 studies were quality assessed. None was rated 'Strong', one (4%) 'Moderate', with the remainder 'Weak'.

Speech and language therapists represent 8% of AHPs and contributed 12 (8%) of studies. These split roughly equally between children and adults (often including their parents or carers). Interventions were largely at Secondary (50%) or Tertiary (42%) levels. The main conditions targeted were children's communication disorders (50%) and adult aphasia (25%). Many interventions were parent- or carer-mediated, so home (50%) and school (17%) settings predominated, with only 3 interventions (25%) in clinical settings. In terms of study design, 6 (50%) were Before and after, 5 (42%) CCTs and one (8%) RCT. 10 (83%) were rated 'Weak' and 2 (17%) 'Moderate'. The biomedical paradigm predominated, despite most studies taking place in non-clinical settings.

Podiatrists represent 8% of AHPs and contributed 8 (6%) of studies. The main conditions targeted were diabetic foot complications (38%), self-management (38%) and falls prevention (25%). Interventions were largely at Secondary (50%) or Tertiary (42%) levels. Primary care (63%), community (25%) and home settings (12%) predominated. In terms of study design, 3 (38%) were Before and after, and 3 (38%) RCTs; the remainder (25%) were Other. 6 studies were quality assessed; of these 5 (83%) were rated 'Weak' and one (17%) 'Moderate'.

Arts therapists constitute 2% of AHPs and contributed 2 (1%) studies. Both were qualitative pilot studies of primary HP interventions addressing suicide/parasuicide among school-age males in secondary education

settings. Both studies were rated 'Weak' and neither intervention was based on an explicit HP approach.

Radiographers represent 17% of AHPs, but contributed just 2 (1%) studies. Both were Before and after studies of Secondary level interventions. One evaluated an educational intervention to promote breast cancer awareness among older women exiting the national screening programme. The other evaluated a primary care educational initiative to reduce referrals for lumbar spine X ray in cases of low back pain. One was rated 'Weak', the other 'Moderate'.

Paramedics, orthoptists, prosthetists/orthotists, optometrists: no studies meeting our inclusion criteria were found.

Conclusions

Absence of evidence is not evidence of absence. In particular, we cannot draw any conclusions about the level of HP activity among AHPs.

In the form of information-giving, advice and support for self-care, we found abundant evidence that HP is a routine component of AHP practice. In the best interventions, it was rigorously theorised, systematically developed and delivered, and robustly evaluated. Generally, however, theorisation was weak (or more often altogether lacking), and interventions appeared to be poorly planned, unsystematically delivered, and were weakly evaluated. This calls into question the capacity of AHPs to respond to policy urging them to adopt social marketing and similar behavioural change approaches.

At present, although HP is a standard component of everyday AHP practice, it seems to be largely taken-for-granted. We suggest that it might be beneficial if AHPs were educated to approach information- and advice-giving as a *complex intervention*. This would focus their attention on the core features of the recent MRC guidance on the development, evaluation and implementation of complex interventions. These are: good theoretical understanding of how an intervention causes change, so that weak links in the causal chain can be identified and strengthened; attention to process evaluation in order to detect implementation problems; tailoring of the intervention to ensure a good 'fit' with the local setting; co-development of intervention and evaluation. We believe that adoption of these principles would precisely target many of the weaknesses of intervention design, delivery and evaluation that characterised the literature we reviewed.

The evidence points also towards significant variation between professions. Physiotherapists and dietitians appeared to have better developed research capacity than other AHPs. Approaches to HP, evaluation and research also appeared to vary, with dietetics and physiotherapy subscribing to a biomedical model, and occupational therapy and arts therapies to a social science model.

Because of this diversity, developing HP capacity among AHPs needs to be tackled in a manner that builds on the achievements of each of the professions and responds to their individual needs. Professional bodies and HEIs are bound to be key participants in this process.

The Report

1 Background, aims and objectives

1.1 Health promotion: the international context

For over sixty years the attainment of the highest possible standard of health has been established as a basic human right (1), along with an acceptance that it is a government's responsibility to ensure adequate healthcare and social provision. Nevertheless, how health is perceived and how it can be improved has been influenced by increased understanding of what determines health (2). Lalonde (3) established that human biology, the environment and lifestyle were as important in determining health as the quality of health service provision. The World Health Organization (WHO) built on this tenet in later charters (4,5). The Ottawa Charter (6), in particular, incorporated Lalonde's (3) premise and is viewed as seminal in the evolution of health promotion (7). The Charter explicitly emphasised the social model of health which encompassed the wider determinants of health, including health inequality, suggesting that in order to improve health structural changes in society were necessary (8).

The Ottawa Charter underlined that to facilitate the process of increasing a person's control over their health, agents of health promotion are required to *advocate, enable* and *mediate* health action. These actions are stated as building healthy public policy, creating supportive environments, strengthening community action, developing personal skills and reorienting health services. All of these actions have been explored and further developed in later declarations (9-11). However, in order for effective health promotion to be achieved, it has been made very clear in all of these documents that the responsibility for health promotion should be shared between health professionals, wherever health promoting activity is carried out.

The International Union of Health Promotion and Health Education (IUHPE) has recently specified that to put healthy public policy into practice, the systems, infrastructures, institutions, resources and skills needed to deliver health promotion must be clearly outlined in public health policy (12). Furthermore, the healthcare sector needs to be reoriented to take greater responsibility for health promotion and the management of chronic disease, especially since such a reorientation also has the potential to make significant contributions to the reduction of healthcare costs. The IUHPE also states that the most successful health promotion programmes that empower communities are those that are linked to normal daily life, build on local traditions and are led by community members.

1.2 Health promotion: recent UK policy

The need to “reorientate our health and social care services to focus together on prevention and health promotion” (13) in order to create a “health-promoting NHS” (14) is now a central focus of the UK Government’s public health agenda. How health promotion is delivered and implemented and what issues are considered important have been directly influenced both by the structure of healthcare services and the WHO values and principles established in the agreements and declarations, outlined above, that have been adopted by the UK government. A number of national health promotion policies have focused on targets similar to some of those set by the WHO for the European Union (4). Priorities have been set to reduce coronary heart disease, cancer, sexual health and mental health problems (14-16), and policy relating to older people is increasingly concerned with the promotion of health and ‘active ageing’ (17).

As Scriven (8) notes, however, a change in emphasis occurred from influencing lifestyles alone to recognition of the need to target the social and environmental barriers to good health, particularly inequalities in health. Influential to this shift was the growing body of evidence of the effect of poverty on health (18,19). Furthermore, as the Acheson Report highlighted, the number of individuals living in poverty in the UK had grown, as had the difference in health status between the richest and poorest in society (20). As a consequence of these findings and others recognising disease prevention and health promotion as having the potential to reduce healthcare costs (21), recommendations have been made stressing the importance of evaluating all future health policy in terms of its impact on health inequalities (22). Subsequent health promotion policies have attempted to address these issues (14,23).

Despite this shift in emphasis, the individualistic approach to public health arguably remains the dominant discourse (24), a perception reinforced by current recommendations to use techniques drawn from the marketing industry in order to improve health. *Choosing Health*, for example, espoused the principles of empowering and supporting individuals in making healthy choices and of fostering environments in which such choices are easier (14). This was to be achieved through professional collaboration and partnerships, tailoring messages and supporting vulnerable and deprived sections of society. To affect health outcomes it was recognised that messages needed to be “given, received, believed, understood and acted on” (14). Social marketing was proposed as the medium through which to increase public awareness, personalise health messages and deliver long-term behaviour change.

The appropriateness of this approach as a tool for increasing the impact of health promotion has been explored in an independent review commissioned by the government (25). This concluded that through understanding people’s health behaviour it was possible to determine the support required to change this behaviour in desirable ways. Parallels may

be drawn between social marketing and social cognition models that have also been used to affect behaviour change, such as the Theory of Planned Behaviour (26) and the Transtheoretical Model (27). As a result of the findings of this review, a strategic framework was formulated showing how and where social marketing and other behavioural change approaches could be adopted throughout health delivery systems (28). Guidance produced to assist PCTs in the commissioning of health improvement services (29,30) has stressed the importance of commissioning health information and promotion campaigns that deliver their messages using social marketing techniques. The current interest in behaviour change tools appears to indicate a re-emphasis of the government's earlier desire to bring about health improvement through persuading the population to adopt healthier lifestyles.

The structure of the NHS over the last ten years has been shaped by the *NHS Plan* (31), which outlined the resources needed to improve health and well being and deliver health services. This policy built on an earlier document that stressed the importance of collaborative working across agencies and organisations and defined professional responsibilities through service frameworks and clinical governance (32). Moreover, Primary Care Trusts (PCTs) were set up and given powers to assess needs, plan and secure health services to improve health (33). Using the vocabulary of the Ottawa Charter (6), PCTs were encouraged to "develop partnerships" with local communities, local government and others. Further policy development stressed the importance of preventative and community services aiming to increase access through personalising services to suit specific target groups (13), and reinforced communities' role in commissioning services which went beyond treatment, in order to maintain individuals' health and independence (29). Clear benchmarks were set in order to measure the effectiveness of action in these areas (34).

The plan for the next ten years is outlined in the *NHS Next Stage Review* (35), which sets out a vision for how hospital and community services will continue to grow and develop. There is continuing emphasis from previous policies on the importance of primary and community care services that improve health. The review focuses on improving access to care, empowering patients, improving quality and preventing ill health. Four principles are said to underpin the implementation of this review. The first of these is co-production, whereby implementation decisions are made in partnership with all key stakeholders. Second is subsidiarity, according to which power is devolved to the lowest practical level. Third is clinical ownership and leadership of the necessary action. Fourth is system alignment, which conceptualises the NHS as a system, rather than an organisation, that applies the common principles of the NHS Constitution (36) to ensure a high quality of service provision. The *Next Stage Review* is supported by a number of other documents that specifically outline the vision for primary and community care (37), providing details of the structure of nursing and AHP education and training (38), the roles and

responsibilities of nurses and AHPs in primary care (39) and a framework outlining the professional competencies required for an effective AHP workforce (40). These are all underpinned by the NHS constitution that crystallises the principles and values of the NHS (36).

More recent policy, covering the healthcare strategy for 2010–15, continues to emphasise the central importance of preventative measures (and the need not to reduce spending on them, as happened in the past), partnership working and patient-centred approaches: “We need a paradigm shift in health – away from ‘diagnose and treat’ towards ‘predict and prevent’” (41).

1.3 The allied health professions

The allied health professions (AHPs) are a diverse group of graduate-trained autonomous practitioners who deliver care to patients across a wide range of care pathways and in a variety of settings (42).

The Department of Health recognises 12 professions as AHPs. Over 75,000 are employed in the NHS in England (43), with significant and increasing numbers working in other public services, including social care and education, and in the private and charitable sectors. Each profession has at least one professional body, whose roles include supporting and representing its members, advancing the profession, encouraging high standards of practice, promoting and providing education and CPD, supporting and encouraging research, and monitoring standards of undergraduate education. The AHPs are regulated by the Health Professions Council (HPC), created by the Health Professions Order 2001, which maintains a register of professionals who meet their standards for training and continuing professional development (CPD), professional skills and proficiency, professional conduct and health (44). All of the AHPs have at least one legally protected professional title. Further information about the AHP workforce and professional roles is given in Table 1.

All the AHPs share a number of attributes: for the most part, they are first-contact practitioners; they perform essential diagnostic and therapeutic roles; work across a wide range of locations and sectors within acute, primary and community care; and perform functions of assessment, diagnosis, treatment and discharge throughout the care pathway, from primary prevention through to specialist disease management and rehabilitation (45). However, these similarities mask a number of important differences across what is in reality a highly heterogeneous group of professions. Most obviously, they differ significantly in terms of their size, ranging from physiotherapists (c.20,000) and occupational therapists (c.15,000), through speech and language therapists (c.7,000), down to arts therapists (c.700) (43). These differences in size are correlated (although not consistently) with significant variations in professional organisation, power, status and public visibility. Their professional ethos, education and

practice vary in terms of the extent to which they approximate to the biomedical paradigm, with radiographers and physiotherapists at one extreme, and arts therapists at the other. The settings in which they operate and the professional interfaces which they need to negotiate are also highly divergent. Radiographers and paramedics, for example, practice largely (though not exclusively) in clinical settings and in the context of a relationship with a single profession, whereas physiotherapists, occupational therapists and speech and language therapists interface with a much wider range of professionals, both within health and across other sectors, such as social care, education, housing and the prison service.

In common with other health professionals, AHPs are increasingly being asked to work more flexibly, actively promote change and develop extended roles which cross professional and organisational boundaries (46-48).

1.4 Health promotion and the allied health professions

The values of the Ottawa Charter can be seen to have had a positive influence on public health policy development in the UK. For example, its recommendation that the responsibility for health promotion should be shared between health professionals has been increasingly adopted as a policy approach. There was also early recognition of the AHPs' potential role in reorienting the delivery of advice on healthier living to address the needs of all sections of society, but particularly the poorest (16).

Early policy that defined professional responsibility through the establishment of national service frameworks and clinical governance enabled not only AHPs' responsibilities to be clarified but also highlighted their role in collaborative working across professions and indicated how professional roles could be extended (32). In particular, the *National Service Framework for Older People* (50) defined service models and set standards for the care of older people, which included promoting health and active lives in old age and recognised the contribution of AHPs to improving outcomes for strokes and falls. In establishing community authority to assess and secure health services, there was potential for greater AHP involvement in activities to improve health through developing partnerships, as recommended by the Ottawa and later Charters (10).

However, though the *NHS Plan* outlined the resources needed to provide information and support services to promote health, prevent disease and facilitate self-care and rehabilitation (31), it was less clear on the role envisaged for the AHPs. The *Plan*, whilst systematically outlining the roles of nurses, midwives and health visitors, failed to do the same for AHPs. This omission was rectified some months later in *Meeting the Challenge* (46), a strategy for the AHPs which documented their central role in implementing protocol-based care and facilitating joint working practices for rehabilitation and intermediate care. Furthermore, it suggested that AHPs needed roles to lead and manage the NHS reforms. Nonetheless, the fact that this strategy

was supplementary rather than integral to the *NHS Plan* reduced the potential of AHPs to influence the implementation of policy. This may have been why Scotland felt it necessary to produce its own strategy that defined AHP roles in the ongoing assessment, treatment and rehabilitation of individuals (51).

Table 1. The allied health professions

Profession	Professional role	Protected title(s)	Professional body	HPC Registered (UK)	NHS-employed (England) ²
Physiotherapy	Assess and treat people with physical problems caused by accident, ageing, disease or disability, using physical approaches in the alleviation of all aspects of the person's condition.	Physical Therapist, Physiotherapist	Chartered Society of Physiotherapy	42,676	20,045
Occupational Therapy	Assess, rehabilitate and treat people using purposeful activity and occupation to prevent disability and promote health and independent function.	Occupational Therapist	British Association of Occupational Therapists	30,122	14,572
Radiography	<i>Diagnostic radiographers</i> produce high-quality images on film and other recording media, using all kinds of radiation. <i>Therapeutic radiographers</i> treat mainly cancer patients, using ionising radiation and, sometimes, drugs. They provide care across the entire spectrum of cancer services.	Diagnostic Radiographer, Radiographer, Therapeutic Radiographer	The Society & College of Radiographers	25,318	15,625
Paramedics	Ambulance service professionals who provide urgent and emergency care to patients. They assess and treat patients before transferring or referring them to other services, as appropriate.	Paramedic	College of Paramedics	15,019	9,203 ³
Speech and Language Therapy	Assess, diagnose and manage disorders of speech, language, communication and swallowing in children and adults. They work with patients, families, teachers and others to reduce the impact of these difficulties on people's wellbeing and their ability to participate in daily life.	Speech and Language Therapist, Speech Therapist	Royal College of Speech and Language Therapists	12,169	7,001
Podiatry / chiropody	Diagnose and treat abnormalities of the foot. They give professional advice on prevention of foot problems and on proper care of the foot.	Chiropodist, Podiatrist	The Society of Chiropodists & Podiatrists	12,581	3,772

² Headcount. Includes consultant therapists, managers and therapists, and excludes technicians and other support workers. Figures are for England only. Additionally, around 10,000 AHPs are employed by the NHS in Scotland, 4,000 in Wales and 3,500 in Northern Ireland (390-392).

³ Ambulance paramedics only. Excludes 685 managers and 705 emergency care practitioners, many of whom are HPC-registered paramedics.

Dietetics	Translate the science of nutrition into practical information about food. They work with people to promote nutritional wellbeing, prevent food-related problems and treat disease.	Dietitian	British Dietetic Association	6,700	3,749
Orthoptics	Diagnose and treat eye movement disorders and defects of binocular vision.	Orthoptist	British Orthoptic Society	1,278	1,001
Art therapy	Provide a psychotherapeutic intervention that enables clients to effect change and growth by the use of art materials to gain insight and promote the resolution of difficulties.	Art Psychotherapist, Art Therapist	British Association of Art Therapists		
Music therapy	Facilitate interaction and development of insight into clients' behaviour and emotional difficulties through music.	Music Therapist	Association of Professional Music Therapists	2,576	744
Dramatherapy	Encourage clients to experience their physicality, to develop an ability to express the whole range of their emotions and to increase their insight and knowledge of themselves and others.	Dramatherapist	British Association of Dramatherapists		
Prosthetics / orthotics	<i>Orthotists</i> design and fit orthoses which provide support to part of a patient's body, to compensate for paralysed muscles, provide relief from pain or prevent physical deformities from progressing. <i>Prosthetists</i> provide care and advice on rehabilitation for patients who have lost or who were born without a limb, fitting the best possible artificial replacement.	Orthotist, Prosthetist	British Association of Prosthetists & Orthotists	825	180 ⁴
TOTALS				149,264	75,892

Sources: (42,43,49)

⁴ Estimate. Around 70% of orthotists are employed by companies contracted to the NHS, with about 30% employed directly by the NHS. The proportion of prosthetists directly employed by the NHS is much smaller (2.5%). The ratio of orthotists to prosthetists is roughly 2:1 (351).

Three years later, a comprehensive list of ten key roles for AHPs was produced (52), providing validation of AHP professional responsibilities. The first five points approved the extended clinical and practitioner roles of AHPs that crossed professional and organisational boundaries. The extended role that would enable AHPs where appropriate to be the first point of contact for patient care was made explicit. Through single assessments they would be able to diagnose, request and assess diagnostic tests, prescribe within defined protocols and discharge or refer patients to other services.

Furthermore, their consultancy role was acknowledged in promoting patient independence and gave credit to their roles in informing and educating healthcare professionals, students, patients and carers. The last five points included emphasising the importance of developing AHP leadership roles in clinical care and in the strategic organisation of services. Their "central role in the promotion of health and wellbeing" was reiterated, along with their responsibility to develop and apply research evidence to clinical and strategic practice. Finally, their responsibility for extending and improving inter-professional and inter-organisation collaboration for shared working practices was made clear. The introduction of benchmarks for good practice in specific fields of health promotion (34) had the potential to empower AHPs through the audit process to show where they have enabled health improvement to take place, and encouraged them to view every patient contact as a health-promoting opportunity.

Despite these assertions that AHPs have a central role in health promotion, health promotion policy documents have often failed to emphasize the potential scope of AHP involvement in this area. *Choosing Health*, for example, used a case study format to illustrate the breadth and scope of health promotion activity (14), though only five of the 57 examples mentioned the contribution of AHPs. Indeed the document that outlined the roles, functions and development of the specialist workforce who would lead these changes made no mention of the contribution of AHPs (53).

Similarly, the community services White Paper (13), which proposed increased access to preventative and community services and the personalisation of services to suit the lifestyles of specific target groups, included 46 examples of innovate healthcare provision or health promotion initiatives, only five of which referred to AHP activity. Furthermore, of the AHP groups that could have been used to demonstrate the breadth of health improvement activity, only occupational therapists, speech and language therapists and physiotherapists were cited. The role of dietitians was not highlighted, although two lay services were mentioned that provided dietary advice to diabetes patients. The opportunity to acknowledge the breadth of AHP roles was therefore not only missed, but there was also an implied message that dietetic advice could be provided by non-professionals. Such implicit messages could potentially have the effect of undermining the professional expertise of an important AHP group and influence the choice of 'beyond treatment' services purchased by the newly established

community commissioners (29). Explicit references to the role of AHPs in the context of health promotion areas in which they are actively involved are also noticeable by their absence in more recent policy documents (41).

The *Next Stage Review* (35) focused on the future development of both prevention and treatment services, emphasising primary and community care services as playing a central role in helping people lead healthy lives. It reiterated that health promotion “should be embedded in the millions of daily contacts between clinical staff working in the community and patients” (39) and that more should be done to promote health at all life stages, systematically identify and support those most at risk of ill-health, and increase access to services that help people maintain and improve their health and wellbeing, with primary and community clinicians enhancing their role in promoting equality of opportunity and equality of health outcomes.

AHPs were explicitly acknowledged as having had a central role in contributing to these aims, which Graham Pope, Chair of the AHP Federation, described as recognising “the contribution of AHPs as integrators of care; the strategy sets the scene and allows AHPs the opportunity to further develop more accessible and patient-centred services” (39). The *Review* goes on to stipulate that central to the development of health improvement services over the next ten years is PCTs’ ability to commission services perceived as relevant to the needs of local communities. Services that make use of AHP expertise in reducing the problem of obesity were cited, along with continuing action to reduce alcohol and drug abuse, smoking, sexual and mental health. The pivotal role of AHPs in enabling greater participation, independence and health in children, families and older people was also recognised. AHP activity was modelled on the key roles outlined above (52), whilst three elements were identified to facilitate AHP delivery of health services: establishing a mandatory data collection system to facilitate performance review; improving access through the promotion of self-referral to certain services (such as physiotherapy) where appropriate; and developing and integrating measures to evaluate the quality of clinical service performance.

1.5 Need for the research, aims and objectives

AHPs currently contribute to health promotion in several priority areas. For example:

- *Occupational therapists*. ‘Occupation’ covers not just work but also activities of daily living that provide structure and enable self-care and participation in society. Examples of the role of OTs include working with older people to maintain functional capacity, prevent accidents and enhance independence and security; building self-efficacy, communication skills and media awareness among people

with eating disorders; and the promotion of psychological health in people with rheumatoid arthritis.

- *Physiotherapists* are involved in the education and empowerment of people undergoing neurorehabilitation for brain injury and strokes; drawing up individualised exercise plans for people suffering from, or at risk of acquiring, coronary heart disease; and looking at work habits to prevent problems such as repetitive strain injury.
- *Speech and language therapists* are increasingly involved in HP. Examples include: providing training in communication techniques to parents of young children with delayed or disordered speech/language; working with professional voice users (such as teachers and singers) to encourage good vocal hygiene and prevent voice disorders; giving advice on extending the potential of older people with communication difficulties associated with dementia or stroke; and promoting health and wellbeing of people with eating and swallowing difficulties associated with stroke, neurodegenerative diseases and head and neck cancer.
- *Dietitians* promote healthy food choices and prevent disease by increasing awareness of the link between nutrition and health and translating scientific information relating to food and health into language that the general public can understand.
- Though not officially defined by the Department of Health as AHPs, *optometrists* form an important part of the non-medical health workforce and play a crucial health promoting role. The more than 9,500 optometrists in England and Wales perform around 12 million sight tests per year (54,55), providing considerable scope for the promotion of eye health. Their areas of responsibility include giving advice on nutrition and smoking cessation (since poor diet and smoking are linked to cataracts and macular degeneration) and lifestyle advice to patients with diabetes to prevent diabetic retinopathy, which leads to irreversible sight loss unless treated early.

The involvement of AHPs in promoting health is therefore already quite considerable. However, it is widely thought that, despite the recent policy emphasis on expanding their health promoting role outlined above, their true potential for making contributions in this area has been poorly understood, and their skills and expertise consequently underutilised. One reason for this may be that their activities have tended to be construed as clinical, working with the patient to alleviate the effects of illness or disability, rather than promoting health and wellbeing in the population in general (56). Furthermore, in common with the rest of the non-medical workforce, relatively little is currently known about the roles played by AHPs in public health and health promotion, nor is it clear precisely which roles they are expected to undertake. Research identifies problems of under-

capacity and a lack of clarity around training, career progression and inter-disciplinary working (22,57).

More generally, in comparison with the medical and nursing professions, AHPs are an under-researched sector of the health workforce, and there have been few systematic literature reviews relating to AHPs as a professional grouping; notable exceptions include reviews of the effects of the introduction of clinical practice guidelines in nursing, midwifery and AHPs (58), and an SDO-commissioned review of the evidence on Extended Scope Practice (ESP) for AHPs (48,59). Though systematic reviews have examined a number of specific health promoting interventions carried out by particular AHP groups, such as occupational therapy for patients with problems in activities of daily living after stroke (60) and dietary advice given by dietitians to reduce blood cholesterol (61), we know of no reviews examining the health promotion role of AHPs as a group. In order to inform future AHP policy and practice, and increase the effectiveness and value for money of the limited resources devoted to health promotion, which is typically given far lower priority than health care, there is therefore a need to provide an overall assessment of the current and potential contribution to health promotion of this important but underutilised group of professionals.

The *aims* of this research are: to evaluate the evidence relating to the involvement of AHPs (including optometrists) in the promotion of individual and community health; and to provide recommendations for policy, practice and further research in relation to AHPs' future contribution to health promotion.

The *objectives* are: to undertake a systematic review and narrative synthesis of the literature relating to the current role of AHPs in health promotion.

2 Methods

This review follows the well-established methods for conducting systematic reviews developed by the Centre for Reviews and Dissemination (62), and the guidance for conducting reviews in the areas of public health and health promotion (HP) developed by CHPPHF (63).

2.1 Types of studies

Systematic reviews of HP interventions pose numerous challenges due to multi-component interventions, diverse study populations, multiple outcomes measured, wide range of approaches and study designs used, and the effect of context on intervention design, implementation and effectiveness (64). RCTs are a useful source of evidence of effectiveness, although their results may have limited generalisability and for many HP interventions may not be available due to feasibility and ethical issues. Non-randomised studies may therefore often represent the best available evidence. For policy makers and practitioners to use review findings to implement effective HP programmes, the traditional evaluation of evidence must therefore be expanded to incorporate the assessment of theory, integrity of interventions, context and sustainability of interventions and outcomes.

The following types of studies providing evidence of effectiveness of interventions have been included in the review:

- *Randomised study designs.*
- *Non-randomised study designs*, such as before and after studies, interrupted time series and comparisons with historical controls or national trends.

The following types of material have also been included:

- *Qualitative research* has been included in order to help identify the factors that enable or impede the implementation of an intervention, describe the experience of the participants receiving it and their subjective evaluations of outcomes, and understand the diversity of effects across studies, settings and groups.
- *Economic evaluations and resource allocation/utilisation studies.*
- *Theoretical papers, descriptive studies, policy documents* and similar material have been included in order to provide background and context.

Because the review examines the HP activity of AHPs based only in the UK, it is restricted to English-language publications. Given that the review addresses the current role of AHPs in HP, within the context of the modern

NHS, the search strategy has been limited to studies published from 2000 to 2008 inclusive. The rationale for the start date is the major shift in the roles and responsibilities of AHPs that occurred as a consequence of the reorganisation of the NHS and move to patient-centred care heralded in that year by the *NHS Plan* (31). Its core principles included a significant HP element, and increased the systematic involvement of AHPs in HP, disease prevention and self-care. Due to time and resource constraints it was not possible to include studies published during 2009.

2.2 Types of participants

The review includes studies examining the HP role of all of the AHPs referred to in Chapter 1 (including optometrists), working in the United Kingdom (England, Scotland, Wales and Northern Ireland) with all patient/client groups, either alone or with other health professionals in multidisciplinary teams.⁵

2.3 Types of interventions

HP is a contested and complex concept (65). Its meaning is often confused and unclear (66), and it is frequently used as a synonym for 'public health'. It is therefore particularly important, in carrying out a review of health promoting activities, to be as clear as possible about what will be understood by the concept. Although there is no universally agreed definition, there is some consensus that HP refers to holistic strategies encompassing behaviour, health education, community development, empowerment, prevention and protection (8). It includes a set of established principles and strategies that enable individuals and communities to increase control over and improve their health.

A number of models and theories, such as the Health Belief Model and the community mobilisation theory, inform the following four broad *approaches* to HP (8,67):

1. *Health education* (e.g. interventions to modify behaviours and attitudes; the provision of information, education and advice in order to support healthy lifestyles, activities of daily living and self-care);
2. *Individual empowerment* (e.g. building psychological perception, self-esteem, self-efficacy, motivation and internal locus of control);
3. *Community development/empowerment* (e.g. advising and working with local government, the voluntary sector and other organisations);

⁵ It was originally intended to include international evidence in the review. However, an initial scoping study suggested that the large volume of potentially relevant studies would make inclusion of international evidence unfeasible within a single review. There are also issues of comparability due to the diversity of professional roles and the disparate international contexts and healthcare systems in which AHPs work. It was therefore decided to limit the review to evidence from the UK.

lobbying, advocacy and mediation; social marketing and the use of mass media, including the Internet);

4. *Structural adjustment* (e.g. legislation, fiscal measures, healthy public policies, organisational development, socio-political and economic change).

These approaches operate at four *levels*:

1. *Primary HP* involves promoting the health of the general population to maintain health, prevent ill health and health damaging behaviour, and improve quality of life (QoL);
2. *Secondary HP* promotes the health of individuals or groups where health damaging behaviour has already occurred, to change behaviour and prevent health moving to a chronic or irreversible stage;
3. *Tertiary HP* promotes the health of those with chronic conditions or a disability to enhance QoL and potential for healthy living;
4. *Quaternary HP* promotes the emotional, social and physical health and wellbeing of the terminally ill.

The review includes AHP-delivered interventions across the first three approaches mentioned above (health education and individual/community development/empowerment), and operating at any of the four levels (primary, secondary, tertiary, quaternary). Although, in principle, health promoting interventions can be distinguished from more narrowly 'clinical' interventions, such a distinction is in practice difficult to draw for the AHPs, since many of their core professional activities, such as patient empowerment and the provision of information, training and education, constitute HP interventions. Furthermore, as with other health professionals, it is common for AHPs to engage in HP, for example by providing health promoting information verbally or in printed form, in situations where it is not the primary focus of the intervention being delivered. The review therefore distinguishes between studies containing an HP element in which:

1. HP is the primary focus of the intervention and is evaluated;
2. HP is not the primary focus of the intervention but the HP element is nevertheless evaluated; and
3. HP is not the primary focus of the intervention and the HP element is not specifically evaluated.

The HP element of study types (1) and (2) has been subjected to quality assessment, data extraction and synthesis, and the extent to which evaluated HP activity is the primary or subsidiary focus of studies forms part of the analysis. Studies of type (3) have not been assessed for quality or analysed in detail but have been used, in conjunction with types (1) and

(2), to develop a picture of the nature and extent of AHP engagement in different types of HP during the course of their general clinical and professional activity.

2.4 Types of outcome measures

The following types of outcome have been included:

- health outcomes for patients;
- process/intermediate outcomes;
- impact on patients, carers and health care staff;
- subjective experience of patients, carers and health care staff;
- sustainability of the intervention in different environments and contexts;
- impact on the wider community and health care system;
- resource allocation and utilisation;
- costs and cost-effectiveness.

2.5 Sources of information

Given the very broad scope of interventions that fall under the heading of 'health promotion', it was necessary to search a broad range of resources covering not only health-related material, but also education, social care, the social sciences and other subjects.

2.5.1 Electronic bibliographic and full-text databases

- *General health and biomedical*: Web of Science, Medline, EMBASE, EBM Reviews (Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Database of Abstracts of Views of Effects (DARE)), Health Technology Assessment Database, National Library for Health (relevant Specialist Libraries and other resources), UK National Research Register (NRR), Health Management Information Consortium (HMIC) (DH-Data, Kings Fund Library Catalogue Database and the Health Management Information Service), Current Controlled Trials, Turning Research Into Practice (TRIP), AgeLine, Ageinfo.
- *AHP, nursing and midwifery*: CINAHL, AMED, PEDro (Physiotherapy Evidence Database), OTseeker, British Nursing Index, Nursing Full Text Plus, Maternity and Infant Care/MIDIRS.
- *Psychology/psychiatry*: PsycINFO/PscyLIT.
- *HP/public health*: EPPI-Centre HP databases (BiblioMap, Database of Promoting Health Effectiveness Reviews (DoPHER) and Trials Register of Promoting Health Interventions (TRoPHI)).
- *Social care*: Social Care Online.
- *Sociology and social sciences*: Sociofile, Sociological Abstracts, Social Sciences Citation Index, Campbell Collaboration Social, Psychological, Criminological and Educational Trials Register (C2-SPECTR), International Bibliography of the Social Sciences (IBSS).

- *Education*: ERIC, EPPI-Centre education databases (Database of Education Research, Current Educational Research in the United Kingdom (CERUK)), British Education Index.
- *Economics*: Econlit, NHS Economic Evaluation Database.
- *Qualitative research*: Database of Interviews on Patient Experience (DIPEX).
- *Guidelines*: National Institute for Health and Clinical Excellence (NICE).

2.5.2 'Grey' (unpublished) literature

Grey literature sources are particularly important for finding material relating to HP. Sources searched included:

- OpenSIGLE (System for Information on Grey Literature in Europe);
- governmental/official websites (e.g. the Department of Health; websites of all UK AHP professional bodies);
- theses and dissertations (Index to Theses);
- conference proceedings (ISI Proceedings);
- Google Scholar.

2.5.3 Hand searches

Since many papers may be missed by electronic searches because of the limitations of bibliographic indexing systems, hand searches of the following AHP-specific publications were carried out:

- Physiotherapy
- Physiotherapy Theory and Practice
- British Journal of Occupational Therapy
- British Journal of Podiatry
- Podiatry Now
- Journal of Human Nutrition and Dietetics
- Proceedings of the Nutrition Society
- Nutrition Bulletin
- British Journal of Nutrition
- Radiography
- International Journal of Language and Communication Disorders
- British and Irish Orthoptic Journal
- Ophthalmic & Physiological Optics
- British Journal of Music Therapy
- International Journal of Art Therapy: Inscape

2.5.4 Individuals and organisations

Relevant material was also identified through contact with the UK AHP professional bodies and interest groups, key researchers and practitioners, academic and professional mailing lists (e.g. the AHP-related groups on Jiscmail). Requests for information were publicised by most of the AHP professional bodies via their websites and newsletters.

2.5.5 Snowballing

Bibliographies of included studies were scanned to identify further references.

2.6 Search strategy

Given the extreme heterogeneity of studies in this area, and the wide range of outcome measures of interest, no terms for study designs or outcome measures were included in the search strategy. Because of the extent and diversity of the vocabulary used to refer to HP and HP-related interventions, and because, as described above, the search strategy needed to identify studies in which HP was not the primary intervention focus and which therefore may not have been indexed using HP-related keywords, no attempt was made to include such terms in the search strategy.

The following strategy was used for Ovid MEDLINE, and modified for use with other resources as appropriate:⁶

[AHP-related terms]

1. (profession\$ supplementary OR ahp\$ OR allied health OR profession\$ allied).tw.
2. exp ART THERAPY/ OR exp MUSIC THERAPY/ OR exp PSYCHODRAMA/
3. (art\$ therap\$ OR drama therap\$ OR dramatherap\$ OR music\$ therap\$ OR psychodrama\$).tw.
4. exp PODIATRY/
5. (chiropr\$ OR podiatr\$).tw.
6. exp DIETETICS/ OR exp DIETARY SERVICES/ OR exp MENU PLANNING/
7. (dietetic\$ OR dieti#ian\$ OR diet\$ service\$).tw.
8. exp OCCUPATIONAL THERAPY/
9. occupational therap\$.tw.
10. exp ORTHOPTICS/
11. orthopti\$.tw.
12. exp EMERGENCY MEDICAL TECHNICIANS/
13. (paramedic\$ OR emergency care practitioner\$ OR ambulance person\$ OR ambulance staff\$ OR ambulance crew\$ OR emergency person\$ OR emergency medic\$ person\$ OR emergency medic\$ staff\$ OR emergency medic\$ techn\$ OR emergency staff\$).tw.

⁶ Terms in capital letters are MESH subject headings.

14. exp "PHYSICAL THERAPY (SPECIALTY)"/ OR exp PHYSICAL THERAPY MODALITIES/
15. (physiotherap\$ OR physical therap\$ OR manual therap\$ OR hand therap\$).tw.
16. (prosthetics OR prosthetist\$ OR orthoti\$).tw.
17. (radiographer\$ OR radiologic\$ techn\$ OR radiograph\$ techn\$ OR nuclear medicine techn\$).tw.
18. exp SPEECH-LANGUAGE PATHOLOGY/ OR exp SPEECH THERAPY/ OR exp LANGUAGE THERAPY/ OR exp "REHABILITATION OF SPEECH AND LANGUAGE DISORDERS"/
19. (speech therap\$ OR language therap\$ OR voice therap\$ OR swallowing therap\$ OR communication therap\$ OR speech patholog\$ OR language patholog\$).tw.
20. exp OPTOMETRY/
21. (optometr\$ OR optician\$).tw.
22. OR/1-21

[Geographical filter: UK only]

23. exp Great Britain/
24. (uk OR united kingdom OR britain OR british OR england OR english OR scotland OR scottish OR wales OR welsh OR northern ireland OR northern irish OR nhs OR national health service OR london).cp,in,tw,nw,jw,kf.
25. 23 OR 24
- [Join groups of terms and limit by language and date]*
26. 22 and 25
27. limit 26 to english language
28. limit 27 to yr="2000 - 2008"

2.7 Data management

Study data were stored and coded within EPPI-Reviewer (Version 3), the EPPI-Centre's web-based application for managing, extracting, synthesising and presenting data for inclusion in systematic reviews (68).

2.8 Screening

After the removal of duplicate studies, material resulting from the searches was screened against the inclusion criteria for potential relevance, i.e. English-language, UK-based, HP-related and involve one or more of the included AHP groups. Reasons for (potential) inclusion or exclusion were

documented. The first 100 references retrieved from searches of two electronic databases were used for training purposes to ensure that reviewers were consistent in assessing references using the eligibility criteria outlined above. Where studies could not be assessed on the basis of the title or abstract alone, the full text (or abstracts, where these were not available) was obtained in order to assess eligibility for inclusion. The full text of studies passing the screening process, and any identified related studies, was obtained.

Studies that were relevant to the review topic but did not include outcome data or evaluation were noted and set aside to be used for background and context.

2.9 Data extraction and critical appraisal

Data extraction and assessment of methodological quality for the studies passing the screening process were undertaken by four members of the review team and recorded on electronic data collection forms within EPPI-Reviewer (see Appendix 2). If data were missing, attempts were made to contact study authors to obtain the information necessary for critical appraisal.

Data extracted for each study included, where available:

- Full publication details
- Study design
- Theoretical HP approach (health education, individual empowerment, community development)
- Level of HP intervention (primary, secondary, tertiary, quaternary)
- Subject area of intervention
- Details of the intervention
- Provider (i.e. the AHPs and any other professionals involved in delivering the intervention, and the composition and roles of multidisciplinary teams (if applicable))
- Setting
- Target group/population, including (where specified) data on place of residence, occupation, socio-economic status, age, gender, ethnicity, religion and health status
- Nature and extent of any consumer or community involvement
- Process measures (adherence, exposure, training, etc.)
- Background/context details
- Outcomes/findings
- Conclusions and any implications identified for practice, policy or further research

Studies were assessed for content and quality using tools recommended by CHPPHF (63), including the Quality Assessment Tool for Quantitative Studies (69), which assesses both internal validity (methodological quality and bias) and external validity (generalisability) and the CASP appraisal tool for Qualitative Research developed by the Public Health Resource Unit,

which assesses rigour, credibility and relevance (70). Economic evaluations were assessed using Drummond *et al.*'s ten-point checklist (71). The overall quality of each study was rated/scored using the scoring system provided by the appropriate quality assessment tool.

The data extractions and critical appraisals for all included studies were independently double-checked by a fifth reviewer and any discrepancies resolved by discussion within the review team.

Even though the focus of the review was on health promotion, where studies included a clinical intervention alongside a health promotion intervention, we carried out data extraction (though not critical appraisal) of the clinical intervention as well. However, in order not to blur the health promotion focus, and also for reasons of space, we do not report here on the clinical interventions in detail (such as control group interventions, measures and outcomes).

Summaries of all included studies are provided within the profession-specific tables presented in Chapters 4 to 14. Summary quality ratings are also provided (under the 'Quality' column) for each study in which the health promotion component of the intervention was evaluated. Where 'N/A' appears in the 'Quality' column, this indicates that the health promotion component of the study was not evaluated, and that critical appraisal was therefore not carried out (see Section 2.3). Individual components of the quality assessments for all included studies are provided in Appendix 1.

The complete data extractions and critical appraisals for all studies (including additional reviewer comments on study quality) are available in the web database which accompanies this report. Please contact the report authors or NIHR SDO for details of how to access this database.

2.10 Data analysis

Given the high levels of heterogeneity among the included studies, data analysis took the form of a narrative synthesis of the evidence, an approach which is appropriate for synthesising the results of studies crossing disciplinary boundaries and with disparate study designs.

We had intended that the synthesis would take the form of an 'evidence profile' for each health promotion intervention. This would consist of:

- A description of what the body of evidence tells us about the intervention.
- An assessment of the overall quality of the evidence for the intervention, using the framework developed by the GRADE Working Group (72), which assesses a number of factors, including the relative importance of outcomes, trade-offs between benefits and harms (including the degree to which certain groups received more or

less benefit from interventions), and the balance of net benefits and costs.

- A classification of the intervention according to a modified version of the MRC framework for developing and evaluating complex health improvement interventions (73,74). This involves: identifying the theories and conceptual models underlying interventions in terms of key processes, contexts, outcomes and mechanisms; generating tentative estimates of effect sizes and health gains; and identifying barriers in intervention pathways.
- A stratification (where feasible) of interventions by populations, HP approaches and levels, interventions, settings, context and outcomes.
- An assessment of the degree to which interventions are likely to be effective and sustainable in different settings, using the RE-AIM model (Reach, Efficacy, Adoption, Implementation, and Maintenance) (75) for conceptualising the potential for translation and the public health impact of an intervention.
- An assessment of the gaps and flaws in the evidence base for the intervention, and of the type of future research required to address these.

In the event, the evidence base was not sufficiently complete or robust to support a narrative synthesis in the form intended. Instead of focusing on the outcomes of health promotion, therefore, the narrative synthesis that follows focuses on the process. Thus, we report on types of conditions, target subjects, settings and levels of interventions, styles of AHP working, relationships with other professions, approaches to health promotion and research.

2.11 *Prioritisation exercise*

The original protocol included a prioritisation exercise, consisting of a modified Delphi process involving a multi-stakeholder Expert Panel. Its aim was to build consensus on priorities and generate a "*series of robust recommendations for the development of the health promotion role of AHPs*". The Panel would identify: health promotion approaches that were most effective and should be further developed; areas in which AHPs were not currently fulfilling their potential for promoting health; capacity, organisational and skills barriers to further involvement by AHPs in this area, and ways in which these barriers might be overcome; ways in which the multidisciplinary aspect of AHPs' work might be enhanced and strengthened; approaches that were likely to be most effective in tackling health inequalities; ways in which public and community engagement might be improved; and 'gaps' in the current evidence base and the main priority areas for further research.

However, as the review progressed, it became apparent that the evidence base was too fragmentary and insufficiently developed to support the prioritisation exercise that the protocol envisaged. Following consultation with members of the Project Advisory Group and NIHR SDO, it was agreed that the prioritisation exercise would not add value to the review, and it was omitted.

3 Overview of results

Initial searches of electronic databases conducted between June and August 2008 returned 57,074 references. After de-duplication, 39,845 (70%) remained. Results from individual databases are shown in Table 2. Database searches were re-run in September and October 2009 with a cut-off date for publication of the end of 2008. Together with references obtained via the hand searches, requests for information and snowballing, this brought the total number of references to be screened to 71,236 (44,772 after de-duplication).

Table 2. Summary of results from initial searches of electronic databases

Database	Total hits	Deduped hits	% retained
Medline	11,739	11,585	99
CINAHL	13,565	10,680	79
AMED	2,993	1,489	50
Intl Bibliography of the Social Sciences	179	147	82
PsycINFO	3,074	1,417	46
Health Management Information Consortium	2,457	1,621	66
Cochrane Database of Systematic Reviews	720	526	73
Cochrane Central Register of Controlled Trials	546	33	6
Cochrane Methodology Register	63	27	43
Database of Abstracts of Reviews of Effects	296	296	100
Health Technology Assessment	80	74	93
NHS Economic Evaluation Database	353	351	99
British Nursing Index	1,747	1,094	63
EMBASE Psychiatry	3,048	1,740	57
Maternity and Infant Care	275	179	65
Ovid Nursing Full Text Plus	783	86	11
AgeLine	78	30	38
AgeInfo	212	146	69
Social Care Online	1,000	415	42
ERIC (Education Resources Information Center)	210	107	51
British Education Index	379	204	54
Bibliomap	96	64	67
DoPHER	95	39	41
TRoPHI	83	48	58
EconLit	41	32	78
PEDro	1,468	1,066	73
Otseeker	485	169	35
Web of Science (SCI-EXP, SSCI, A&HCI)	3,721	1,006	27
ISI Proceedings	853	483	57
Index to Theses (UK Theses)	365	340	93
UK National Research Register	4,493	3,962	88
Social Policy and Practice	1,532	363	24
OpenSIGLE	45	26	58
TOTALS	57,074	39,845	70

The initial reference screening process resulted in the exclusion of 43,275 of these, with 1,497 references of relevance to the review topic remaining. Reasons for exclusion are given in Table 3 (only one reason is given per excluded paper, though in many cases papers could have been excluded for more than one reason).

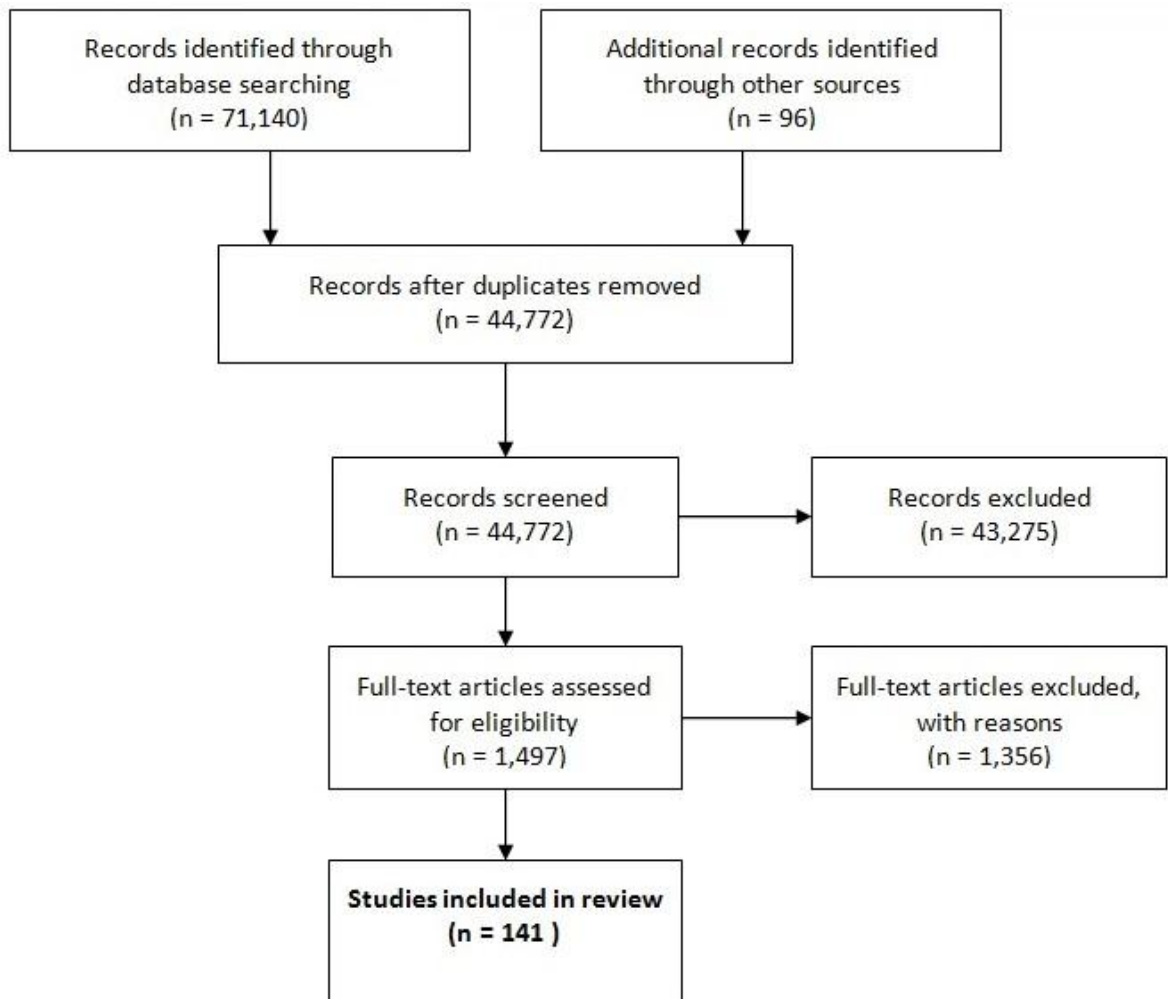
Table 3. Initial reference screening: reasons for exclusion

Not English language	15
Not in date range	28
Not UK	10,335
Not involving AHPs	3,990
Not health promotion	28,467
Additional duplicates identified	440
Total	43,275

Of these, 141 studies were deemed to have met the review inclusion criteria and proceeded, along with any related papers, to the data extraction and critical appraisal stage. The remainder were retained in order to provide background and context. These included intervention-only studies (e.g. news reports, with no evaluation), opinion pieces, review articles and policy documents. In total, the full text of 2,079 studies was retrieved from online and library sources.

A flow diagram summarising the review process is given in Figure 1. Detailed results for each allied health profession are set out, in descending order of number of included studies, in Chapters 4 to 14.

Figure 1. The review process: flow diagram



Adapted from (76).

4 Physiotherapists

4.1 Profile of the profession

Physiotherapy is concerned with human function and movement and uses physical approaches to promote, maintain and restore physical, psychological and social well-being (77). Physiotherapists work with people to optimise their functional ability and potential. They address problems of impairment, activity and participation and manage recovering, stable and deteriorating conditions. They treat a wide range of physical conditions across the life span, using a range of approaches including manual therapy, therapeutic exercise and the application of electro-physical modalities. While often associated with musculoskeletal sports injuries, their work extends to a number of conditions, including asthma, back pain, cerebral palsy, incontinence, multiple sclerosis, neck pain, osteoarthritis, osteoporosis, stroke and whiplash (78).

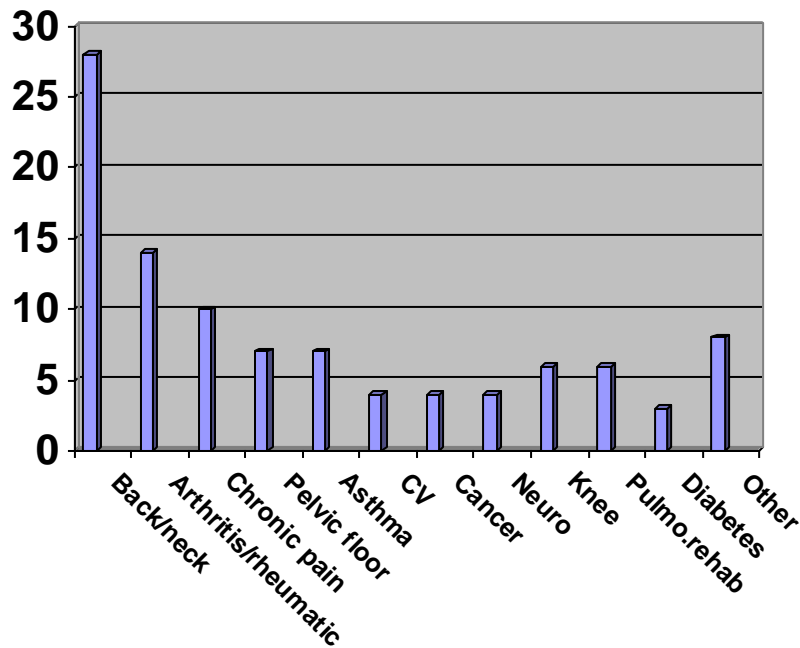
Physiotherapists work most frequently as members of a team and in an increasingly diverse variety of settings such as intensive care, mental illness, stroke recovery, occupational health and care of the elderly. As a result of initiatives to increase access and reduce waiting times for treatment, patients are increasingly referring themselves directly to physiotherapists without previously seeing any other health professional (79). Physiotherapists play a broad role in health promotion, health education and self-care. This can extend to advising and teaching carers, other health professionals and support workers in order to provide a coherent approach to maximising independence and well-being (77).

Physiotherapy is, by some margin, the largest of the AHPs. There are over 42,600 HPC-registered practitioners in the UK (49), around 20,000 of whom are employed within the English NHS (43). The professional body is the Chartered Society of Physiotherapy.

4.2 Results from the systematic review

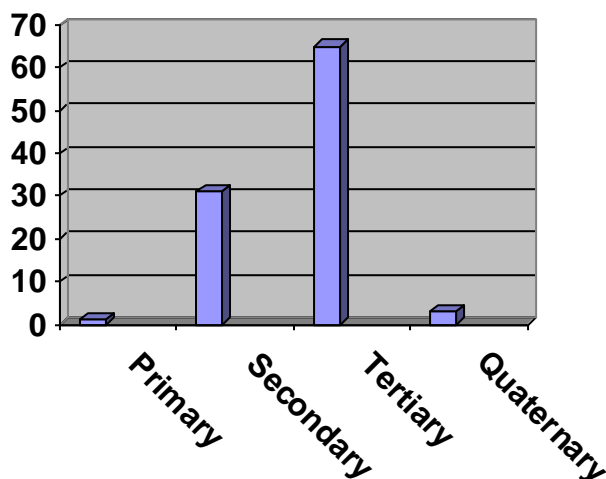
Seventy-two studies met the criteria for inclusion in the review and have been divided into 12 groups (see Table 4 to Table 15): back and neck pain (20 studies), arthritis/rheumatic disorder (excluding back/neck/knee pain) (10), chronic pain, fibromyalgia and chronic fatigue syndrome (7), pelvic floor disorders (5), breathlessness/asthma (5), knee pain/disorders (4), pulmonary rehabilitation (4), cardiovascular disorders (3), cancer (3), neurological conditions (3), diabetes (2) and other target groups (6). These are shown below.

Figure 2. Physiotherapist HP interventions by condition (%)



The level of health promotion is shown in Figure 3, with two thirds (65%) of interventions at secondary level, 31% at secondary level, 3% at quaternary and just one (1%) at primary level.

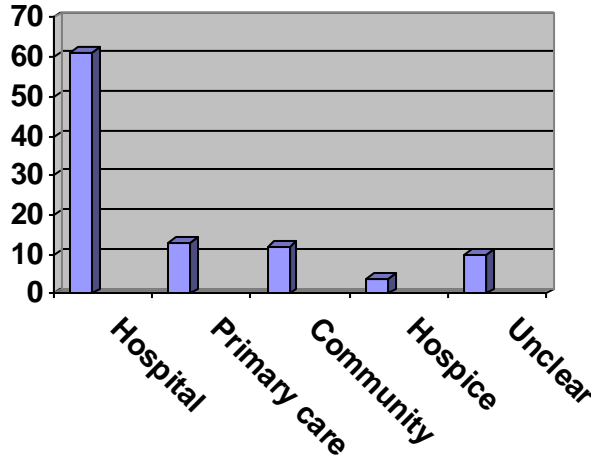
Figure 3. Physiotherapist HP interventions by level of health promotion (%)



In just under half (47%) of these interventions, the health promotion component was the main focus. 89% of interventions were targeted at adults, 7% at older people and 4% at adolescents (juvenile arthritis, chronic pain and knee pain). Six interventions (8%) were targeted at women (four pelvic floor or urinary dysfunctions) and just one (1%) at men (erectile dysfunction). These interventions were delivered in a wide range of settings

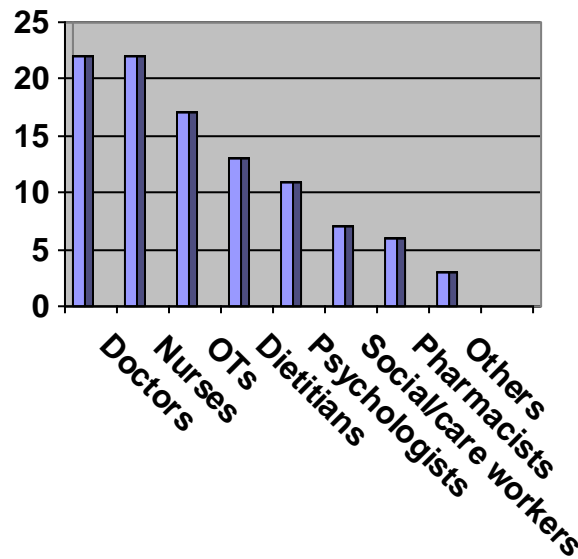
(Figure 4, below), but with hospitals (61%) predominating, followed by primary care. Community settings (12%) were diverse, including a rural camp, leisure centres and a mobile unit).

Figure 4. Physiotherapist HP interventions by setting (%)



Two-thirds (67%) of interventions were lead by physiotherapists, six (8%) by doctors, three (4%) by dietitians and two (3%) by nurses. In twelve instances (17%) it was unclear what the lead profession was; many of these referred to a Multidisciplinary Team (MDT) without specifying roles within it. An extremely wide range of other professions were involved in these interventions (Figure 5). Doctors and nurses (both 22%) led the way, with hospital specialists predominating in both instances (GPs were involved in only two interventions). They were followed by Occupational Therapists (17%), then dietitians (13%), social/care workers (7%) and pharmacists (6%). The predominance of hospital specialists and the under-representation of community or non-clinical professions are both consistent with the conditions targeted and the types of setting as described above. It is impossible to know whether this strong bias towards the hospital is real (i.e. reflects a genuine bias in physiotherapist health promotion activity) or is an artefact, reflecting an uneven distribution of research and evaluation expertise in the two types of setting.

Figure 5. Physiotherapist HP interventions by other professions involved (%)



In terms of the research itself, CCTs (including RCTs) predominated, accounting for 67% of designs, followed by Before and After studies (24%), Qualitative designs (8%) and Other (3%) (Percentages total more than 100% because some interventions published more than one paper of different designs). It is noteworthy that almost all of the Qualitative study designs were situated in community or palliative care settings. 17% of interventions were subjected to economic evaluation, a much higher proportion than for the other professions we examined. Two thirds of economic evaluations were of interventions for back and neck pain. Of the interventions subjected to full quality appraisal, just 6% were rated Strong, 36% Moderate and 58% Weak (one was impossible to determine). Five economic evaluations received full quality appraisal. Of these, four were rated Strong, and one Moderate. While the biomedical model of research appears to predominate (certainly among hospital physiotherapists), there is evidence of an emerging qualitative tradition among community and palliative care physiotherapists.

Table 4. Physiotherapy - back and neck pain: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(80); (81,82)	To compare the effectiveness & cost-effectiveness of 3 kinds of physiotherapy commonly used to reduce disability in chronic low back pain (LBP). (Chronic LBP a common, disabling, and costly problem)	RCT; economic evaluation	Adults with LBP >12 weeks duration; NHS hospital, London (inner-city)	(1) normal PT (n=71): up to 12 sessions @30 mins individual therapy; (2) spinal mobilisation (n=72): 8 sessions @ 90 mins individual training + group exercise classes; (3) pain management (n=69): 8 sessions @ 90 mins group structured back pain education with group general strengthening, stretching & light aerobic exercises.	Secondary HP (not main focus: treatment); behavioural interventions (approach explicit: cognitive behavioural); self-management, physical activity, self-esteem/efficacy	Measures: Roland Disability Questionnaire (primary), pain, health-related QoL, time off work. Healthcare costs associated with LBP & QALYs were also measured. Similar improvements with all interventions at 18 months. Pain, QoL & time off work also improved in all groups (no between-group differences). Mean healthcare costs & QALY gain: (1) £474 & 0.99; (2) £379 & 0.90; (3) £165 & 1.00. More widespread adoption of PT-led pain management could result in considerable cost savings for healthcare providers.	Moderate (RCT); Strong (economic evaluation)	PT-led. Delivered by senior PTs & PT assistants. Commentary on economic evaluation at (83)
(84)	To investigate the effect of early one-off assessment,	RCT	Adults with chronic musculoskeletal	(1) 1x40 minute individual one-off assessment, self-	Tertiary HP (main focus); behavioural	Measures: perception of pain & problem size	Weak	Physio-led.

	including advice & exercise, on patients referred with chronic musculoskeletal problems. (Pressure to balance demands & supply in busy PT department)		problems; NHS hospital, Southend (urban)	care advice, & home exercise, with follow-up 6 weeks later (n=58); (2) "standard" PT assessment (n=57).	interventions (approach not explicit); self-management, physical activity, self-esteem/efficacy	(VAS) & overall health status (SF12) (primary), satisfaction questionnaires, discharge rate at follow-up. Significant change in reported mean pain & musculoskeletal problem size for (1); no statistical difference observed in SF12, for physical & mental component scores. Patients more satisfied with (1).		
(85); (86-88)	To measure the effectiveness of routine physiotherapy compared with an assessment session & advice from a physiotherapist for patients with low back pain (LBP)	RCT; economic evaluation	Patients with LBP > 6 weeks' duration; 7 NHS physiotherapy departments South Central SHA	(1) routine PT (n=144); (2) advice only (n=142): 1 session (up to 1 hour) with a PT who carried out a physical examination & gave general advice to remain active, as specified in the Back Book.	Tertiary HP (main focus); health education (approach explicit); self-management	Measures: Oswestry disability index at 12 months (primary), Oswestry disability index (2 & 6 months), Roland & Morris disability questionnaire, SF-36, patient perceived benefit from treatment. Patients in (1) reported enhanced perceptions of benefit but no evidence of long-term effect of PT in disease specific or generic outcome	Moderate	PT-led. Commentary on economic evaluation in (89); BMJ discussion in (90)

						measures. (1) no more effective than (2). No significant differences in NHS costs or effects. Advice by a PT should be considered the first-line treatment for patients with this level of LBP disability.		
(91); (92,93)	To compare the effectiveness of a brief pain management programme with PT incorporating manual therapy for the reduction of disability in patients with subacute low back pain (LBP). (Importance of recognising and addressing psychosocial factors at an early stage)	RCT; economic evaluation	Patients consulting primary care with non-specific LBP of <12 weeks' duration; primary care (multi-centre), West Midlands (mixed urban & semi-rural)	(1) brief pain management programme (n=201) to identify & address psychosocial risk factors for persistent or recurrent LBP-related disability; emphasis on return to normal activity through functional goal setting, with education to overcome psychosocial barriers to recovery; (2) manual therapy (n=201).	Secondary HP (main focus); behavioural interventions (approach explicit: biopsychosocial model); self-management, physical activity, self-esteem/efficacy	Measures: Roland & Morris disability questionnaire (12 months), QALYs. No statistically significant differences found. Clinical outcome the same at 3 & 12 months for both groups. (1) is cost-effective, however the absence of a clinically superior treatment raises the possibility that it could provide an additional primary care approach, in fewer sessions, allowing patient & doctor preferences to be considered.	Strong (RCT); Strong (economic evaluation)	(1) delivered by 3 community PTs; led by primary care academic researchers. Commentary on economic evaluation in (94).
(95)	To determine whether, among patients with persistent	RCT; economic evaluation	Patients 18-65 with LBP & still reporting LBP 3 months after	(1) 8x2-hour group exercise session over 6 weeks (n=116) comprising	Tertiary HP (not main focus: treatment & HP); behavioural	Measures: pain (VAS), Roland & Morris Disability Scale (primary),	Weak (RCT); Weak (economic	Led by MDT of independent academics. Delivered by PTs

	disabling low back pain (LBP), a group program of exercise & education using CBT reduces pain & disability. (Lack of evidence on whether such interventions, delivered by trained individuals in primary care, result in improved outcomes)		initial consultation; 9 family practices, East Cheshire	active exercise & education delivered by PTs using a CBT approach, educational booklet and audio-cassette (self-management advice); (2) booklet & cassette only, usual GP care (n=118).	interventions (approach explicit: CBT); ADL, self-management, physical activity, self-esteem/efficacy	general health (EQ-5D). (1) showed only a small & non-significant effect at reducing LBP & disability over 1 year. Low cost with ICER of £5,000 per QALY. Observation that patient preference for treatment influences outcome warrants further investigation. Need for effectiveness of brief CBT training to be assessed & its delivery monitored in future research.	evaluation)	trained by a PT experienced in CBT approaches to pain management. Commentary on economic evaluation in (96)
(97)	To reduce the number of 'unnecessary' referrals for lumbar spine x-rays, by GP and patient education. (High incidence of unnecessary requests for X-rays from patients with back pain)	Before and after study	People (20-55) referred from primary care with request for lumbar spine X-ray; GP practices, North-West England (mixed urban/rural)	Posters in GP practices informing patients that x-rays are not needed/helpful; self-help back care leaflets distributed via GP practices; feedback to GPs on referral rates.	Secondary HP (not main focus). Health education (approach not explicit); self-management.	Measure: number of referrals for X-rays. Referrals reduced by 54%, though unnecessary referrals remained at c.90% (<5% justified against Royal College of Radiologists guidelines). Effects of leaflet on patient back self-care not evaluated. Action recommended to target GPs continuing to refer	Moderate	Radiographer & PT involved in development & design of education materials. Design & evaluation led by consultant radiologist, delivery by GPs.

						unnecessarily.		
(98); (99)	To compare outcomes of a brief PT intervention based on CBT principles versus normal PT care. (High incidence of neck pain & costs of treatment)	RCT; economic evaluation	Patients with subacute and chronic neck pain; PT departments in a community setting, Yorkshire & North Lincolnshire	Mean age 48. (1) brief PT intervention (1-3 sessions) using CBT principles to encourage self management and return to normal function (n=139); (2) usual PT, at the discretion of the PT concerned (n=129).	Tertiary HP (main focus); behavioural interventions (approach explicit: CBT); self-management, self-esteem/efficacy	Measures: Northwick Park neck pain questionnaire (NPQ) (primary), health-related QoL (SF-36), Tampa scale for kinesophobia. At 12 months (2) patients had a small but significant improvement in NPQ scores compared with (1) patients. Patient preferences made no difference to outcomes. (2) may not be good value for money for the average individual in this trial but could be cost-effective for those indifferent toward which treatment they receive. Additional training for PTs in CBT techniques might improve this approach.	Moderate (RCT); Strong (economic evaluation)	PT-led; also involved consultant clinical psychologist. Commentary on economic evaluation in (100)
(101); (102,103)	To compare a brief PT pain management approach using	RCT; economic evaluation	Patients with chronic neck or back pain >2 weeks duration;	219 had back pain, 96 neck pain. The 'McKABI trial'. (1) Solution-Finding	Tertiary HP (not main focus: recovery from neck/back pain);	Measures: Tampa Scale of Kinesiophobia (primary), Roland	RCT (moderate); Strong (economic	Led by rehab consultant; involved 28 PTs from 7 PT

	CBT principles with the McKenzie Approach. (Spinal pain very common & results in large costs. Evidence that behavioural interventions effective for chronic back pain)		NHS hospitals, Hull (mixed density)	Approach (n=154): brief PT pain management using CBT principles, including education, reassurance & goal-setting; (2) McKenzie Approach (n=161): a commonly used PT method.	behavioural interventions (approach explicit: CBT); self-management, physical activity, self-esteem/efficacy	disability and Northwick Park neck pain questionnaires. No statistically significant differences in primary outcomes. Patient satisfaction greater for (2). Both interventions resulted in modest but clinically important improvements in Roland & Northwick Park scores. (1) could be more cost-effective, as fewer sessions were needed, though the extra cost of (2) may be worth paying given its additional benefit.	evaluation)	departments; also involved psychologists
(104)	To investigate patient satisfaction with physiotherapy telephone advice in addition to standard management for low back pain (LBP). (Telephone triage & advice increasingly important but its role in PT has not	RCT; qualitative study	Patients with LBP referred by GP to PT; 2 general practices, Newcastle (urban)	Mean age 50. (1) one-off PT telephone advice on LBP self-management (e.g. activity promotion & modification) before their usual care (n=99); (2) usual care only (waited for a consultation) (n=124)	Secondary & tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, self-management, physical activity, self-esteem/efficacy	Measure: patient satisfaction (modified version of the Patient Satisfaction with Healthcare Provider Scale). Group (1) more satisfied than (2) with PT service received. (1) reduced reported symptoms associated with LBP	Weak	Led by 1 PT. Patient satisfaction data only.

	been explored in detail)					& was easily remembered by recipients. It offers a "new way" of providing PT care to patients in line with NHS plans. Need for future research assessing clinical outcomes.		
(105); (106-110)	To compare a class-based exercise programme & a spinal manipulation package with 'best care' for low back pain (LBP) in general practice (UK Beam trial). (LBP a common & costly problem; effectiveness of different physical treatments is unclear)	RCT; qualitative study; economic evaluation	Adults <65 years consulting GP about LBP; 181 general practices, 83 community settings around 14 centres across the UK.	56% female. (1) Best GP care (control, n=338); (2) best care + exercise classes (n=310); (3) best care + spinal manipulation (n=353); (4) best care + manipulation + exercise (n=333). Best care included <i>The Back Book</i> which promotes normal physical activity, return to work & positive attitudes towards LBP.	Secondary HP (not main focus: treatment); behavioural interventions (approach explicit: CBT); physical activity.	Relative to (1), (4) achieved moderate benefit at 3 months and small benefit at 12; (3) achieved small-moderate benefit at 3 months and small benefit at 12; (2) achieved small benefit at 3 months but not 12. Manipulation is a cost effective addition. Manipulation alone (3) probably gives better value for money than (4).	N/A	PTs involved in delivery but intervention largely led by teams of GPs and practice nurses.
(111)	To compare 2 research-based models of care for acute low back pain (LBP). (Direct comparisons between these models are lacking)	RCT	Adults with acute LBP >6 weeks duration; NHS hospital PT outpatients dept, NW London (suburban)	Mean age 35, 50% female. (1) biopsychosocial education (<i>The Back Book</i>) and advice to remain active, immediate pragmatic PT (manual therapy), and exercise	Tertiary HP (not main focus: timing of treatment); behavioural interventions (approach not explicit); self-management, physical activity.	At short-term, (1) more effective than (2), leading to more rapid improvement in function, mood, QoL & general health. Timing of intervention affects the development of	N/A	PT-led. All education & PT & exercise delivered by senior PTs. Paper refers to further analyses planned to determine which aspects of care responsible for

				(n=50); (2) education and advice only (n=52), waiting 6 weeks before treatment.		psychosocial features. If treatment is provided later, the same psychosocial benefits are not achieved. So model (1) seems to offer better outcomes than (2).		the outcome. However these were never carried out (personal communication).
(112)	To examine whether patients with chronic low back pain (LBP) exhibit changes in cognitive factors following Interactive Behavioural Modification Therapy (IBMT). (Extent to which changes in cognitive processes underpin treatment outcome is unclear)	Observational before-after study	Patients with chronic LBP >1 year duration); NHS hospital (outpatient PT dept), Manchester	IBMT (underpinned by CBT principles): 'Work Back to Life' 6-week rehabilitation programme (n=137, mean age 44, 30% male). Comprises exercise, education, problem solving, progressive goal setting. Patients agree long-term behavioural goals that can realistically be achieved by programme end.	Tertiary HP (not main focus); behavioural interventions (approach explicit: IBMT, CBT); self-management; physical activity; self-esteem/efficacy	Patients demonstrated significant favourable changes for a range of cognitive factors. Changes that emerge in cognitive factors are strongly related to treatment outcome. Reductions in fear of movement & catastrophising, & increases in functional self-efficacy appear to be particularly important. Modifying these factors should be a priority when treating patients.	N/A	PT-led. Delivered by 6 PTs trained in IBMT.
(113)	To evaluate the effect of adding specific spinal stabilization exercises to	RCT	Patients (18-60) with recurrent LBP; multi-centre trial (settings	(1) "conventional" PT (n=50) (general active exercise & manual therapy); (2) (1) plus specific	Secondary HP (not main focus: treatment); health education (approach not	Both groups showed improved physical functioning, reduced pain	N/A	10 senior musculoskeletal PTs delivered both treatment packages after

	conventional PT for patients with recurrent low back pain (LBP). (Spinal stabilization exercises for LBP & small-scale studies have identified improvement in outcomes)		unclear)	spinal stabilization exercises. Both groups received <i>The Back Book</i> .	explicit); self-management, physical activity, self-esteem/efficacy	intensity, & improvement in physical component of QoL. Mean change in physical functioning (Roland & Morris Disability Questionnaire) was -5.1 for the specific spinal stabilization exercises group and -5.4 for conventional PT group. No statistically significant differences between the groups for any of the outcomes, at any time.		training.
(114)	To compare a group exercise programme with individual PT for patients with non-specific low back pain (LBP) from a materially deprived area	RCT	PT patients with LBP lasting >6 weeks; community site, single city in north-east England	(1) 'Back to Fitness' programme (n=118): 8 1-hour classes to increase activity gradually over 4 weeks: low impact aerobics, strengthening & stretching exercises for main muscle groups & relaxation; (2) individual PT (n=119).	Tertiary HP (not main focus: standard intervention); behavioural interventions (approach not explicit); self-management, physical activity	No statistically significant differences between groups on Roland Disability Questionnaire at 3 & 12 months. Only minor improvements in disability scores in both groups at 3 & 12 months. Patients from the most severely deprived areas marginally worse at 3 months; those	N/A	PT-led.

						from more affluent areas tended to improve. Need for more research in deprived areas & recognition of influence of deprivation on treatment outcomes.		
(115); (116,117)	To determine whether manual therapy (MT) or pulsed shortwave diathermy (PSWD), in addition to advice & exercise, provide better clinical outcome than advice & exercise alone in patients with nonspecific neck disorders. (High incidence of neck pain; problems of diagnosis & treatment; lack of high-quality evidence)	RCT; economic evaluation	Adults with clinical diagnosis of nonspecific neck pain and GP referral; NHS hospital, 15 PT outpatient departments, England	Mean age 51. (1) advice & exercise + MT (n=114); (2) advice & exercise + PSWD, n=121; (3) advice & exercise alone (n=115).	Secondary HP (not main focus); health education (approach not explicit); self-management, physical activity	Mean fall in Northwick Park score at 6 months was 11.5 for (3), 10.2 for (1), and 10.3 for (2). No statistically significant differences in mean changes between groups. Addition of PSWD or MT to (3) did not provide any additional benefits. The cost-effective intervention is likely to be (3) or (1), depending on the economic perspective and preferred outcome, but not (2).	N/A	PT-led. Commentary on economic evaluation at (118)
(119); (120-122)	To compare surgical stabilisation of the lumbar spine with an intensive CBT-based rehabilitation	RCT; economic evaluation	Adults with chronic LBP; 15 NHS hospitals (outpatient), UK-wide	The MRC spine stabilisation trial. (1) surgical stabilisation (lumbar spine fusion) (n=176); (2) small-group intensive rehab	Tertiary HP (not main focus: functional rehabilitation); behavioural interventions (approach	No clear evidence that (1) more beneficial than (2). Evidence to support (2) as an alternative to (1) in the management of	N/A	MDT consisting of rehab consultant, PT & clinical psychologist. PT comprised 50% of the programme. 15 research PTs,

	programme for patients with chronic low back pain (LBP). (Chronic LBP a common cause of distress & considerable personal & public financial consequences)			programme (n=173): exercise, education, hydrotherapy & relaxation (CBT principles used throughout to identify & overcome fears & unhelpful beliefs).	explicit: CBT); self-management, physical activity, self-esteem/efficacy	chronic LBP. Surgical stabilisation may not be cost effective.		1 per site. Commentary on economic evaluation in (123)
(124)	To test the feasibility of an RCT comparing manual therapy, exercise & advice, with or without traction, in the management of LBP with 'nerve root' involvement. (Traction commonly used for LBP, predominately with nerve root involvement; however benefits not established.	Pragmatic RCT	Patients with acute/sub-acute LBP with nerve root involvement; 3 PT depts, Health & Social Care Trust, Northern Ireland	(1) Standard care (n=14): manual therapy, exercise, information & advice on self care; (2) (1) + motorised lumbar traction (n=16)	Secondary HP (not main focus: traction); behavioural interventions (approach not explicit); ADL, self-management, physical activity	Intention to treat analysis demonstrated an improvement in all outcomes at follow up points but there appeared to be little difference between the groups.	N/A	PT-led
(125)	Pilot to determine the feasibility of a study to compare manual therapy & active rehab outcomes for subjects with sub-acute/chronic low back pain (LBP). (One of the most	CCT (non-randomised)	Convenience sample of patients with non-specific LBP referred to the PT dept of an acute NHS Trust hospital; Merseyside (urban)	(1) Manual therapy as chosen by the treating PT (n=20); (2) active rehabilitation (n=19) (progressive exercise & education classes twice weekly over 4 weeks)	Tertiary HP (not main focus: active rehabilitation); approach unclear; physical activity	(1) demonstrated greater treatment effect compared with (2). Several alterations to the study design are recommended for the main study.	N/A	Led by 2 PTs. Intervention claimed to be based on (110), but there is no reference to self-care, empowerment, CBT etc.

	common & costly causes of disability. Limited & conflicting evidence to support use of manipulation or exercise)							
(126)	Pilot study to highlight methodological issues involved in conducting an RCT of CBT approach to PT with acute low back pain (LBP) patients showing signs of psychological distress	RCT	Acute LBP patients with signs of psychological distress; NHS hospital, Scotland (urban)	(1) CBT programme integrated within "conventional" PT treatment (manual therapy, exercise, education) (n=6); (2) conventional PT alone (n=6)	Tertiary HP (not main focus: CBT); behavioural interventions (approach explicit: CBT); ADL, physical activity	No significant differences between groups post-intervention. Various methodological issues identified.	N/A	PT-led
(127); (128)	To investigate whether spinal stabilisation exercises are a useful supplement to general trunk exercises in patients with simple recurrent non-specific low back pain (LBP). (Effectiveness concerning physiological & functional parameters is unknown)	RCT	Patients with subacute or chronic nonspecific LBP within 6 weeks of onset; NHS hospital, Manchester (urban)	(1) a general 8-week back and abdominal muscle supervised exercise approach (n=26); (2) (1) + specific stabilization exercises (n=29). Both groups received <i>The Back Book</i> and were asked to repeat exercises at home.	Secondary & tertiary HP (not main focus); health education (approach not explicit); ADL, self-management, physical activity, self-esteem/efficacy	Outcome measures for both groups improved. Self-reported disability improved more in (1) immediately after intervention but not at 3-month follow-up. Generally no differences between the approaches for any of the other outcomes. Stabilization exercises do not appear to provide additional benefit.	N/A	PT-led

Table 5. Physiotherapy – arthritis/rheumatic disorder (excluding back/neck/knee pain): included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(129)	To determine satisfaction among rheumatology patients with one-off education session. (Many patients need only advice and education)	Before and after study (survey)	Rheumatology patients referred for PT (conditions very varied); NHS hospital, West Midlands (urban)	Advice concerned non-medical pain relief, sleep advice, exercises, posture care, pacing & activity (n=30).	Tertiary HP (main focus); health education (approach explicit); ADL, physical activity	Measure: questionnaire covering coping abilities concerning pain, mobility & lifestyle (VAS, devised by author). 77% improvement in pain, 71% admitting some improvement in mobility & 77% in lifestyle; 78% reported increased understanding of their problem, with 50% consequently having fewer Doctor's visits; 77% found the appointment worthwhile. 'One-Stop' PT advice at Clinic or in Primary care could be supported with positive results.	Weak	PT-led. Author-devised outcome measure. Abstract only (limited data).
(130)	To identify the effect of attending a cognitive-behavioural arthritis education programme on the health status of	RCT	Adults newly diagnosed with RA; NHS hospital, Nottingham (urban)	(1) a cognitive-behavioural arthritis education programme (n=32), informed by the health belief model & the theory of self-	Tertiary HP (main focus); behavioural interventions (approach explicit: cognitive-behavioural	Measures: Physical Function subscale of the Arthritis Impact Measurement Scale Two (primary), erythrocyte sedimentation rate,	Moderate	PT-led.

	participants with newly diagnosed rheumatoid arthritis (RA)			efficacy, to promote behavioural change (pain management, psychological coping, goal setting, modelling, persuasion); (2) a standard arthritis education programme (n=22). All sessions were 2 hours per week for 4 weeks.	principles, health belief model, theory of self efficacy); self-management, self-esteem/efficacy	joint count scores, assessments of pain & psychological status. Group (2) had significantly better levels of functional ability & lower levels of helplessness prior to intervention. This was unchanged at 3 months. At 6 months no significant differences between groups for any measure of health status. No significant changes in health status over time in either group. The move to early use of these programmes should be examined further, with larger sample size & longer follow-up.		
(131)	To promote independence in ADL, self-advocacy & peer support among young people with juvenile arthritis. (Challenge for this group is engagement as active participants in their disease)	Before and after study (qualitative)	Adolescents with juvenile arthritis; participants recruited from Birmingham (NHS teaching hospital catchment), camp location	'Independence Break', a 4-day 'Outward Bound' style self-catering residential intervention (n=30, median age 14, 17 female). Adventure activities, e.g. canoeing, climbing,	Tertiary HP (main focus); behavioural interventions, community development (fostering collective identity) (approach not explicit);	Measure: author-devised open-ended questionnaire covering perceived benefits & skills gained, etc. 50% reported improved function; friendships (15/30); peer support	Moderate	PT- & OT-led. Delivery also involved care worker & nurse therapist. Lack of outcome/baseline data & validated tool make it hard to draw conclusions, though results

	management & allowing them to make informed treatment decisions. Entails interventions that meet psychosocial needs & facilitate independence)		unclear (rural)	abseiling and team-building challenges.	ADL/skills, self-management, physical activity, self-esteem/efficacy; other (encourage social interaction)	(7/30); 17/30 reported still being in touch with another participant at 4 months; increased confidence (5/30). Need further research using a validated tool to measure psychosocial skills.		suggest the camp helped form lasting relationships & create peer support. Prospective study of the scheme reported to be in preparation.
(132); (133)	To evaluate the long-term effects of joint protection on health status of people with early rheumatoid arthritis (RA). (Functional ability significantly reduced in people with RA. Behavioural approaches more effective in increasing use of joint protection than 'standard' education)	RCT (4-year follow-up)	Adults with RA <5 years since diagnosis; 2 NHS rheumatology outpatient departments, West Midlands (urban)	1) a standard arthritis education programme (n=62) including joint protection based on typical OT practice, exercise, etc.; 2) a joint protection programme (n=65) incorporating educational, behavioural, motor learning and self-efficacy enhancing strategies to increase adherence.	Tertiary HP (main focus); behavioural interventions (approach explicit: health belief model and others); self-management; self-esteem/efficacy.	Measures: hand pain (VAS), adherence to joint protection (Joint Protection Behaviour Assessment 12) (primary), various indicators of disease activity, functional assessment/ADL (Arthritis Impact Measurement Scales 2), hand status, psychological status (Arthritis Self-efficacy pain & other symptoms subscales, Rheumatology Attitudes Index). At 4 years group (2) continued to have significantly better: joint protection adherence; early	Moderate	OTs and PTs led original intervention.

						morning stiffness; ADL scores compared with (1). Group (2) also had significantly fewer hand deformities. (2) should be more widely adopted. To be cost-effective, therapists should target it at people willing to make the changes required and able to attend all meetings.		
(134)	To evaluate the effectiveness of 3 physiotherapeutic approaches in the management of the rheumatoid hand.	RCT	Adults with rheumatoid arthritis (RA); NHS hospital rheumatology department, Mid-Staffordshire (urban)	Mean age 59.6. (1) information covering basic principles of joint protection, energy conservation, 'tips' relating to personal & household activities, etc. (n=22); (2) (1) + hand-strengthening & mobilizing home exercises (n=21); (3) (1) + a different set of simple hand-stretching exercises (n=24)	Tertiary HP (not main focus); health education (approach not explicit).	Measure: Arthritis Impact Measurement Scales II (AIMS II). Statistically significant improvements in arm function demonstrated for (2) compared with (1) & (3). Patients need only attend 2 appointments for instruction. Obvious additional economic benefits for patients & NHS.	Moderate	Advice delivered by PT (unclear who led).
(135)	To evaluate the effectiveness of a PT programme on pain stiffness and function among patients with osteoarthritis (OA) of the knee. (High	Before and after study	Adults with OA of the knee; NHS hospital rheumatology service, Bristol (urban)	Mean age 66.9, 38% male. 6 weekly 1-hour classes, comprising education (30 mins) and exercise (30 mins).	Tertiary HP (not main focus); health education (approach not explicit); self-management, healthy eating,	Programme as a whole achieved statistically significant reductions in pain, stiffness & disability, but the	N/A	PTs designed, delivered & evaluated the intervention

	prevalence of osteoarthritis)				physical activity	effects of the educational intervention were measured separately. (No measure of long-term effectiveness.) Favourable outcomes for patients can be achieved by implementing evidence into practice.		
(136); (137)	To investigate the benefit of adding acupuncture to a course of advice and exercise delivered by PTs for pain reduction in patients with osteoarthritis (OA) of the knee.	RCT	Adults aged 50+ with clinical diagnosis of knee OA; 37 PT centres, Midlands.	(1) advice & exercise (n=116); (2) advice & exercise + true acupuncture (n=117); (3) advice & exercise + non-penetrating acupuncture (n=119).	Tertiary HP (not main focus: investigating the value of acupuncture in controlling knee pain in OA); health education (approach explicit); ADL	Addition of acupuncture to (1) provided no additional improvement in pain scores. Small benefits in pain intensity & unpleasantness observed in both acupuncture groups, making it unlikely that this was due to acupuncture needling effects.	N/A	PT-led & delivered; GPs also involved.
(138)	To develop a modular behavioural group programme for people with rheumatoid arthritis (RA) and inflammatory arthritis (IA) and evaluate its longer	RCT	Adults with RA or IA; NHS hospital, West Midlands (urban)	Mean age 55.4, disease duration 7.39 yrs (53% <5 yrs). (1) 'Lifestyle Management for Arthritis Programme' over 6-9 months (n=86): self monitoring, talks	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, self-esteem/efficacy	At 6 months group (1) had better pain, fatigue, functional ability & self-efficacy scores, & greater use of health behaviours. At 12 months continued to have	N/A	Delivered by a PT and OT specialist in arthritis. Costs study also carried out.

	term effects on pain, physical and psychological status. (Rheumatology guidelines recommend people with RA receive behavioural self-management education)			from team members & discussions on knowledge & skill development; (2) standard information-focused education programme (n=81). Both arms included exercise & other non-educational elements.		better pain, self-efficacy & psychological status scores & greater use of some health behaviours. A small team of rheumatology therapists can be trained in delivery in 2x2-day courses. Multi-centre trial by rheumatology therapists, longer term follow up and qualitative research needed.		
(139)	To compare the effectiveness of acupuncture with advice & exercises on the symptomatic treatment of osteoarthritis (OA) of the hip. (Few RCTs assessing the effectiveness of acupuncture for OA of the hip)	RCT	Patients awaiting a total hip arthroplasty; NHS hospital, Swindon (urban)	(1) 6 sessions of acupuncture (n=16); (2) advice & hip exercises over 6 weeks (n=12).	Tertiary HP (not main focus: acupuncture); health education (approach not explicit)	Significant improvement in group (1), maintained at 8-week follow-up; no significant changes in group (2). Acupuncture is more effective than advice & exercises.	N/A	PT-led.
(140); (141,142)	To establish the relative effectiveness & cost of a home-based exercise programme, versus home-based exercise plus a class-based exercise programme, for people with osteoarthritis (OA) of	RCT; economic evaluation	Patients with knee OA; homes and primary care, North West England (urban)	(1) home-based exercise programme (n=103) aimed at increasing lower limb strength & endurance, & improving balance; (2) (1) + 8 weeks of twice-weekly PT-led knee classes	Tertiary HP (not main focus); health education (approach not explicit); physical activity	Superior improvement in group (2), still evident 12 months. (2) can be expected to produce small improvements in locomotor function & clinically important	N/A	Classes run by PTs.

	the knee			(education & advice) (n=111), representing typical knee class provision in the UK.		reductions in pain. Likely to be cost-effective & should be implemented. Future research should investigate ways of increasing compliance with home exercise programmes & evaluate their impact in primary care, where most patients are managed.		
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Table 6. Physiotherapy - chronic pain, fibromyalgia and chronic fatigue syndrome: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(143); (144)	To determine the effectiveness of an interdisciplinary CBT treatment for adolescents with chronic pain. (Children & adolescents frequently experience and report pain, though treatment is often judged unsatisfactory)	Before and after study (quantitative)	Adolescents with chronic pain & their parents; NHS hospital, Bath, South West England (urban)	3-week residential programme for child-parent dyads (n=57). Overall treatment contact time was 110 hours (60 hours of physical & occupational activity; 35 hours of CBT, 15 hours education.	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, parenting behaviour, physical activity, self-esteem/efficacy.	Adolescents: significant improvements for self report of disability & physical function. At 3 months maintained physical improvements & reduced anxiety, disability & somatic awareness. Adults: significant improvement in report of adolescent disability, adult anxiety, depression & parental stress. At 3 months significant improvements maintained, 64% improved school attendance, 40% back to full-time education.	Weak	PT-led; also involved OTs, hospital doctors, nurses & psychologists.
(145)	To evaluate a self-management programme for fibromyalgia (FM) patients. (FM is a common rheumatologic disorder but causes & treatment poorly understood)	CCT (non-randomised): "pre-test-post-test, two-group design"; qualitative study	Patients with diagnosis of FM; NHS hospital physio dept, Liverpool.	8 male, 42 female. (1) self-management programme (n=25): 5 weekly 1.5-hr sessions covering information, advice on self-management (e.g. sleep, pain) & encouragement, with group discussion, problem	Secondary HP (main focus); behavioural interventions (approach not explicit); ADL, self-management (pain management), physical activity, self-esteem/efficacy	Measures: helplessness (Rheumatology Attitude Index), exercise tolerance (Borg CR-10 scale) & a standard proforma assessment including demographic/medical details & 5 tests measuring key problems for FM patients: pain, fatigue, poor sleep, perceived exertion & attitude to condition.	Weak	PT-led

				solving & weekly goals set for class & home exercise; (2) no treatment for 6 weeks (n=25).		Semi-structured interview (n=10) explored beliefs about their condition & the actions they took to deal with it. Group (1) found peer group support motivating & reassuring; felt they were in control of their condition; required continued regular support for self-management; significant improvement in attitude towards condition & in pain & perceived exertion. Although statistically significant the reduction in pain may not be clinically meaningful. Follow-up study needed to identify if improvements sustained long term.		
(146)	To determine the effectiveness of a pool-based exercise & education programme plus usual medical care for fibromyalgia syndrome (FMS). (FMS is a chronic muscular pain syndrome whose optimal management remains problematic)	RCT	Women (18-65) with FMS; Northern Ireland (setting not specified)	Mean age 49.6. Northern Ireland Fibromyalgia Therapy (NIFTY) Trial. (1) usual FMS medical care + lecturers & workshops to address attitudes, beliefs & behaviours regarding FMS + 6 weeks of pool-based aerobic	Tertiary HP (not main focus); behavioural interventions (approach not explicit); ADL, self-management, physical activity, self-esteem/efficacy	No significant difference between groups across these time points for any of the (numerous) outcome measures. The addition of a brief pool-based exercise & patient education to usual care does not offer superior benefit. High rates of attrition acknowledged as limiting definitive conclusions.	N/A	Unclear who led intervention; delivered by experienced OTs & PTs. Randomisation claimed but procedure not described.

				exercises (n=42); (2) usual care only (n=44)				
(147)	To promote positive coping strategies, behaviours and attitudes and prevent the long-term negative behaviours associated with chronic pain at an earlier stage. (Need for early intervention in chronic pain)	Before-and-after study	Adults with chronic pain; NHS hospital, Outer London (suburban)	'Pain Coping Strategies programme' (n=31, mean age 45, 57% female). Mostly small group exercise, plus individual brief teaching sessions including goal setting, relaxation, pain education, ADL, medication, healthy eating, etc.	Tertiary HP (not main focus); behavioural interventions (approach explicit: CBT); ADL, self-management; healthy eating, physical activity, self-esteem/efficacy.	Programme reduced anxiety & depression & improved physical performance. However, coping strategies & beliefs about pain were not measured. The outcomes from this pilot can be utilised as a guide for further research using a control group.	N/A	Unclear who led intervention. Groups co-ordinated by a PT, OT, clinical psychologist & clinical nurse specialist.
(148)	To test the hypothesis that group CBT will produce an effective management strategy for patients with chronic fatigue syndrome/myalgic encephalopathy (CFS/ME). (CFS/ME causes substantial suffering, disability & financial loss. In absence of a cure, attention turned to management)	RCT	Adults with a diagnosis of CFS/ME referred by their GP; NHS hospital health psychology department, Bristol (urban, mixed)	(1) group CBT (n=52) incorporating graded activity scheduling; (2) education & support group (n=50); (3) standard medical care (n=51).	Secondary & tertiary HP (not main focus); behavioural interventions (approach explicit: CBT); self-management, physical activity, other (coping strategies, etc.)	(1) had significantly higher mental health scores, less fatigue & were able to walk faster than (3). (1) also walked faster and were less fatigued than (2). (1) did not achieve the expected change as a significant number did not achieve scores within normal range. Treatment did not return a significant number of subjects to within the normal range on this domain; however, significant improvements evident in some areas. Further research needed on outcome measures, etc.	N/A	Led by health psychologist. PT and OT involved. Costs study also included.

(149); (150,151)	To investigate the efficacy of Multi Convergent Therapy (MCT) for the treatment of chronic fatigue syndrome (CFS). (Pilot study indicated that patients benefited from MCT)	RCT	Adults with CFS; NHS hospital, Cardiff.	Mean age 48, 71% female. MCT combines approaches such as CBT & Graded Exercise Therapy in an holistic treatment to improve sleep quality & treat any comorbid mood disturbance. (1) 10 1-to-1 hour-long MCT sessions (n=12); (2) relaxation therapy (n=14); (3) general medical care (n=9).	Tertiary HP (not main focus: treatment & HP); behavioural interventions (approach explicit: MCT); ADL, self-management, physical activity, self-esteem/efficacy	A significant % of (1) patients showed improvement in the primary outcome measure (Karnofsky performance scale) & in their overall condition, lower fatigue & disability levels immediately post-therapy. Improvements maintained at 6-month follow-up. Further research required to examine efficacy of MCT over time & on a larger scale within primary care using additional therapists trained in the technique.	N/A	Conducted by the PT who developed the intervention & has delivered it since 1991; delivery of relaxation therapy & data collection by clinical psychologists. Paper does not address capacity of PTs to deliver CBT component.
(152)	To evaluate the effects of a community patient education/exercise programme, using a cognitive-behavioural approach, for people with fibromyalgia (FM)	RCT	People with FM; community leisure centres, West Midland (urban)	(1) patient education & exercise (n=97): 10x2hr weekly sessions based on social cognitive theory and CBT, education, exercise & skill development; (2) relaxation (attention control) (n=86): 10x1hr weekly classes + booklet on FM & visualisation, deep breathing & other relaxation exercises.	Tertiary HP (main focus); behavioural interventions (approach explicit: social cognitive theory & CBT); self-management, physical activity, self-esteem/efficacy	Short-term improvements resulted from the education & exercise programme but were not sustained. Appropriate selection may improve efficacy.	N/A	Led by consultant rheumatologists.

Table 7. Physiotherapy - pelvic floor disorders: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(153)	To evaluate the acceptability of delivery of advice & information to women with pelvic floor dysfunction (PFD) (Unclear whether group work in this area is acceptable & effective)	Qualitative study (survey)	Women with PFD; non-NHS hospital, East London (urban)	Up to 8 women attended a one-off group advice and information session as a preliminary to individual treatment (anatomy, bladder function, lifestyle advice, teaching pelvic floor exercises, etc.)	Secondary HP (not main focus: intervention merged treatment and HP); health education (approach explicit: Kiger's model of group dynamics); self-management, physical activity (pelvic floor exercises)	Satisfaction measured using self-completion questionnaire. 100% reported that the group met their needs & was useful; 68% said it was encouraging, 60% practical, 56% interesting & understandable, 44% relevant. Providing a women's health advisory group is a useful adjunct to individual treatment.	Weak	Led by 2 senior women's health PTs. Small-scale local unblinded evaluation carried out by service providers.
(154); (155,156)	To compare the efficacy of pelvic floor muscle exercises & manometric biofeedback with lifestyle changes in men with erectile dysfunction. (Pelvic floor muscles active in normal erectile function. Weak pelvic floor muscles could be a cause of erectile dysfunction)	RCT	Men with erectile dysfunction; non-NHS hospital, Devon (urban)	Median age 59.2, range 22-78. (1) pelvic floor exercises, biofeedback & advice on lifestyle changes (n=28); (2) advice on lifestyle changes only (n=27). After 3 months, (2) transferred to (1).	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management	Measures: International Index of Erectile Function, Partner's International Index of Erectile Function, Erectile Dysfunction-Effect on QoL, anal manometry, digital anal measurements & clinical assessment. At 3 months, compared with (2), men in (1) showed significant mean increases in erectile function, anal pressure & digital anal grades. All showed	Moderate	Consultant PT-led; hospital doctors also involved.

						further improvement at 6 months. Similar benefits seen in (2) after transfer to (1). 40% attained normal function, 35% had improved erectile function, & 26% failed to improve.		
(157)	To assess risk factors for developing urinary incontinence following childbirth, and evaluate a pilot PT-led intervention to reduce incidence of incontinence	RCT, nested in larger cohort study	Postnatal women; NHS hospital, South West England (urban)	(1) intensive training in pelvic floor exercises while in hospital + invitation to attend pelvic floor exercise group (n=117); 2) local standard care: verbal promotion of postnatal pelvic floor exercises + instruction leaflet (n=117).	Tertiary HP (not main focus); behavioural interventions (approach not explicit); self-management	Measure: Bristol Female Lower Urinary Tract Symptoms (extent & severity of incontinence & related symptoms, impact on QoL). (1) did not help in preventing future incontinence (relative risk 1.28), but this may be due to failure to persuade the women to return for the classes. Intervention aimed at promoting postnatal pelvic floor exercises should be limited to women who have already been experiencing incontinence problems.	Weak (RCT); weak (qualitative)	PT-led; also involved hospital doctors.
(158); (159,160)	To compare the effectiveness of a group intervention vs individual interventions in the management of	RCT; economic evaluation; qualitative study	Older women with FUI; PT departments in 5 "medium-to-large" NHS trusts, West	n=180. (1) 3 educational sessions on pelvic floor muscle (PFM) exercises & bladder retraining in small	Secondary HP (main focus); health education (approach explicit: an "educational	Measures: Incontinence QoL (IQoL), Symptom Severity Index, EuroQol (not reported), cost	Weak	PT-led.

	female urinary incontinence (FUI). (FUI "one of the most common chronic diseases")		Midlands	groups; (2) same as (1) but delivered as a single 45-minute individual treatment.	model" was used); ADL, physical activity	analysis. (1) is as clinically effective as, and more cost-effective than, (2). PFM exercises & bladder retraining are simple, effective, low-cost treatments. Potential for reducing waiting times. Women should be encouraged to take these up.		
(161)	To assess the impact of pelvic floor muscle training (PFMT) on bladder neck mobility & to correlate any observed changes with standardized outcome measures of the severity of stress urinary incontinence (SUI)	Prospective observational study	Treatment-naive women with urodynamic SUI; NHS hospital, London (urban)	Intensive 14-week individualized programme of 'PFM rehabilitation' (n=97). Continence promoting advice & behavioural modification.	Secondary HP (main focus); behavioural interventions (approach not explicit); self-management; physical activity	Significant elevation of bladder neck position. Displacement of bladder neck on Valsalva reduced. Changes associated with statistically and clinically significant reduction in urine loss & improvement in condition-specific QoL. Results provide important new insight into how dynamic pelvic floor anatomy can be modified by this widely used intervention.	N/A	Taught, administered & monitored by an expert PT; hospital doctors also involved.

Table 8. Physiotherapy – breathlessness/asthma: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(162)	To evaluate the palliative Breathlessness Intervention Service (BIS). (Neglect of breathlessness in advanced cardiorespiratory disease)	Qualitative study	Palliative care patients with breathlessness & their carers; Addenbrooke's hospital, Cambridge	1 session of 1-to-1 advice & education about breathing, positioning, exercise, ADL, plus individualised exercise programme (n=10, 40% male). Telephone progress check after 3 weeks.	Quaternary HP (main focus); behavioural interventions (approach not explicit); self-management; physical activity; self-esteem/efficacy	Measure: interviews exploring participants' experience of using BIS. Patients valued the educational approach to breathlessness & non-pharmacological self-management strategies. Findings will be used to remodel the service, and address deficits identified by it.	Strong	PT-delivered; consultant in palliative medicine also involved.
(163)	To investigate the impact of a PT-led non-pharmacological breathlessness programme for patients with intrathoracic malignancy	Before and after study	Patients with intrathoracic malignancy; NHS hospital, North East England	Patients (n=169) were seen individually for 1 hour on 4 consecutive weeks. Sessions included breathing control, relaxation, anxiety management, energy conservation, goal setting, lifestyle re-adaptation	Quaternary HP (HP not main focus: PT); behavioural interventions (approach not explicit); skills, self-management	First 4 years evaluated. Only 14 completed. All reported improvements in some parameters measured though these did not reach statistical significance. Patients tended to be fitter, had longer median survival & the mechanism of their breathlessness was not progressive cancer. A qualitative approach might be more sensitive at identifying which aspects of the service are most appropriate	N/A	PT-led. Hospital doctors also involved.
(164)	To validate the use of non pharmacological approach for the treatment of	Before and after study; qualitative	Patients with lung cancer experiencing breathlessness not less than 1 month	3 x 90 minute sessions over 4-6 weeks (n=30). A range of strategies used,	Tertiary & quaternary HP (not main focus); behavioural	Highly significant improvements in breathlessness, functional capacity,	N/A	Clinic run by highly experienced palliative

	breathlessness	study	after completion of any active treatment; hosice, Dorset (urban)	including breathing retraining, simple relaxation techniques, activity pacing and psychosocial support.	interventions (approach explicit); self-management	activity & distress levels. Significant improvements in QoL & high levels of satisfaction. Funding should be made available for breathlessness management clinics. Further research needed into whether programme is helpful for other patients with conditions that result in breathlessness.		care PT.
(165)	To investigate the immediate effects of breathlessness management on breathlessness during the activity of stair climbing. (Management considered a major component in treatment but evidence of efficacy)	RCT	Patients suffering from breathlessness brought on by a variety of cardiopulmonary conditions; NHS acute teaching hospital, London (urban)	(1) instruction on an individual basis (45-minute session) in PT breathlessness management, including pursed lip and diaphragmatic breathing, 'blow-as-you-go', positioning & pacing techniques (n=15); (2) control (assumed normal care) (n=15).	Secondary & tertiary HP (not main focus: to improve stair climbing); behavioural interventions (approach explicit); ADL, self-management	(1) reported reduction in breathlessness during stair climbing & after descending. No change in (2). Individuals with dyspnoea are able to incorporate techniques taught as part of a management package of care; in the short term, these have a positive effect on the perception of breathlessness. Future studies should look at the long-term benefit of these procedures.	N/A	PT-led.
(166)	To evaluate the effectiveness of the Papworth method, an integrated breathing and relaxation technique. (No controlled trials have been reported)	RCT	Patients on the asthma register; primary care, South Central SHA (semi-rural)	(1) usual medical care + 5 sessions of Papworth method (n=39) including specific breathing training, education on stress reduction, relaxation training, integration of breathing & relaxation, home	Tertiary HP (not main focus: Papworth method, treatment); behavioural interventions (approach explicit); self-management	Papworth method appears to ameliorate respiratory symptoms, dysfunctional breathing & adverse mood compared with usual care. Further controlled trials warranted to confirm this finding, assess the effect in other	N/A	Research PT-led.

				exercises audiotape; (2) usual medical care only (n=46).		patient groups and determine whether there is some effect on objective measures of respiratory function.		
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Table 9. Physiotherapy - knee pain: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(167)	To determine the efficacy of the individual components of physiotherapy in subjects with anterior knee pain	RCT	Young adults with anterior knee pain; setting not specified, East Midlands	All participants received education: leaflet, 1:1 explanation of the condition, footwear & sport activity advice, pain control, diet & weight advice, prognosis and self-help. Plus: (1) exercise & taping (n=20); (2) exercise (n=20); (3) taping (n=19); (4) education alone (n=22). Each group received 6 treatments over 3 months.	Tertiary HP (not main focus: standard PT); health education/provision of information (approach explicit); self-management, healthy eating, physical activity	Measures: patient satisfaction (satisfied=discharge, not satisfied=continue physiotherapy or refer to consultant) (primary), pain (VAS), WOMAC lower limb function score, Hospital Anxiety and Depression scale, quadriceps strength. All groups showed significant improvements in WOMAC, VAS & HAD scores; improvements did not vary significantly between groups at 3 & 12 months. However, patients who exercised were significantly more likely to be discharged at 3 months than non-exercising patients. Taping not significantly associated with discharge. Greater improvements in WOMAC, VAS & anxiety (but not depression) seen in	Moderate	Study led by orthopaedic surgeon. Treatments led by PT.

						patients who were discharged than in those who were referred.		
(168)	To provide anterior cruciate ligament (ACL) deficient patients with information on their condition & ways to manage it by exercise & activity modification. (Many patients automatically offered ACL reconstruction without referral for PT)	Before and after study	Adult anterior cruciate ligament (ACL) deficient patients; NHS hospital, Leicester (urban)	2x1-hour group sessions in consecutive weeks, 6-12 patients per group (n=61). Week 1: information about the condition; Week 2: exercise plus advice about self care and behaviour modification. 3 months self-care.	Secondary HP (main focus); behavioural interventions (approach not explicit); self-management, physical activity	At short-term follow-up most patients showed some functional improvements with group education & exercise advice.	N/A	PT-led
(169)	To evaluate the effectiveness of 2 strategies for delivering evidence based care to people 55+ with knee pain: enhanced pharmacy review & community physiotherapy.	RCT	Adults 55+ consulting with knee pain; 15 general practices, North Staffordshire	Mean age 68. (1) enhanced pharmacy review (n=108) (management in accordance with an algorithm); (2) community PT (n=109) (advice about activity, pacing pain relief & coping, & an individualised exercise programme); (3) control (n=108): advice leaflet reinforced by telephone call.	Secondary HP (not main focus: treatment); behavioural interventions (approach not explicit); self-management, physical activity	Short-term improvements in health outcomes, reduced use of non-steroidal anti-inflammatory drugs, & high patient satisfaction for (1) & (2) compared with (3). Differences not sustained to 6 or 12 months. Significantly fewer participants in (2) reported consulting their GP for knee pain in follow-up period.	N/A	Delivered by 19 primary care PTs & pharmacists; led by primary care academic researchers.
(170); (171)	To compare the effectiveness of a rehabilitation program integrating	Cluster RCT; economic evaluation	Adults 50+ with CKP (>6 months); NHS community	60% female. "Enabling Self-management & Coping with Arthritic Knee Pain through	Tertiary HP (main focus); behavioural interventions (approach explicit);	Patients undergoing rehab had significantly better functioning (WOMAC) than those receiving (1). No	N/A	Led by independent primary care researchers.

	exercise, self-management, & active coping strategies with usual primary care in improving functioning in persons with chronic knee pain (CKP). (High personal and financial implications of CKP)		hospital, South East London (urban)	Exercise" (ESCAPE). (1) usual primary care (n=140); (2) (1) + rehab delivered to individuals (n=146); (3) (1) + rehab delivered to groups of 8 (n=132). Content & format same for (2) & (3): 12 supervised sessions (6 weeks) with discussion of self-management & coping, etc., with an individualized, progressive exercise regimen.	self-management, physical activity, self-esteem/efficacy	difference between (2) & (3). Program more likely to be cost-effective in improving function than usual primary care. Group rehabilitation reduces costs without compromising clinical effectiveness, increasing probability of cost-effectiveness.		
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Table 10. Physiotherapy - pulmonary rehabilitation: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(172)	To investigate the impact of pulmonary rehabilitation on chronic obstructive pulmonary disease (COPD)	Before and after study (qualitative & quantitative)	Adults with COPD; community (mobile unit), Scotland (rural)	A mobile pulmonary rehabilitation programme (n=51) provided locally in patients' own communities. Exercise programme, disease-specific education, including exercise therapy & education.	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, physical activity	Improvements in a number of areas, e.g.: 93% improved in the Shuttle Walk Test; 4/18 reported smokers stopped; 45% improved on MRC breathlessness scale; 56% noticed improvement in level of disability during daily activities; 63% showed reduction in anxiety & 70% in depression. The	N/A	Run by a respiratory specialist nurse and PT.

						success in improving QoL has implications given the large % of population with COPD.		
(173)	To determine whether clinical real-life rehabilitation for chronic obstructive pulmonary disease (COPD) is effective. (Research supporting the role of pulmonary rehabilitation in COPD, though less known about real-life clinical rehabilitation services)	Retrospective before and after study (quantitative)	Adults with (mostly) COPD & asthma; NHS hospital, South London (urban)	PT-supervised exercise & education, effective use of medications, benefits of exercise, chest clearance, etc. (n=91). 14 group sessions over 7 weeks (duration & ratio of exercise to education not stated)	Tertiary HP (not main focus); health education (approach not explicit); self-management, physical activity, other (relaxation and coping strategies)	76% completed assessment. 37% of patients achieved benefits for both St George's Hospital Respiratory Questionnaire (SGRQ) & Incremental Shuttle Walk Test. 28% were non-responders for both; 17% benefited for SGRQ only and 14% improved exercise tolerance. Randomized trials to evaluate different populations are warranted.	N/A	Education sessions provided by multidisciplinary team comprising OT, nurses, pharmacist, social worker and PT; PTs undertook the evaluation.
(174)	To evaluate the effects of an early community-based pulmonary rehab programme for acute exacerbations of chronic obstructive pulmonary disease (COPD). (Hospital admissions growing burden on NHS. Rehab leads to significant improvements in health related QoL, etc.)	RCT	Patients admitted with an acute exacerbation of COPD; London (inner-city)	(1) 8-week pulmonary rehab programme started <10 days of hospital discharge (n=21); patients also received individualised home exercise programmes encouraging 20+ mins exercise/day; (2) usual care (n=21).	Tertiary HP (not main focus: pulmonary rehab); health education (approach not explicit); ADL, physical activity.	Significant improvements at 3 months for (1) in median incremental shuttle walk distance, mean St George's Hospital Respiratory Questionnaire total score, all domains of Chronic Respiratory Questionnaire (dyspnoea, fatigue, emotion, mastery) & the mental component of SF-36. Larger randomised	N/A	Run by MDT: respiratory PTs, nurses, OT, dietitian, respiratory doctor, smoking cessation adviser, social worker, pharmacist & lay member of a patients' group supervised education activities on a rolling rota.

						studies required to determine long-term effects, cost-effectiveness, etc.		
(175)	To promote rehabilitation of patients with severe chronic obstructive pulmonary disease (COPD), using a combined programme of supervised exercise, advice & goal setting. (Education alone less effective than comprehensive rehabilitation. Effectiveness of rehab has not been examined in severe COPD)	RCT	Adults with severe COPD; NHS hospital, Bristol	Mean age 67, 80% male. (1) 12 x 2-hour group sessions over 6 weeks of supervised exercise + education from MDT + 'intermittent' goal setting (n=54); (2) single 1-hour advice session & advice pack (n=49).	Tertiary HP (not main focus: supervised group exercise accounted for half of each session); behavioural interventions (approach explicit); self-management, physical activity, self-esteem/efficacy	Shuttle walking distance increased significantly in (1) by 43m. The increase of 23m in (2) was significantly less than in (1). Improvements in QoL in (1) were small & not clinically significant. Recruitment problems meant the study was underpowered.	N/A	Led by respiratory physician; advice given by PT and respiratory nurse; dietitian gave advice on diet.

Table 11. Physiotherapy - cardiovascular disorders: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(176); (177-179)	To assess whether a family-based, cardiology programme could increase the proportions of patients & their families achieving the goals for cardiovascular disease (CVD) prevention. (CVD prevention in routine clinical practice is inadequate. Most patients are not referred to a cardiac rehabilitation programme and < a third attend)	Matched, paired cluster RCT	Adults with coronary heart disease (CHD) or at high risk of developing CVD; European multi-centre study, UK sites NHS hospitals, London & East of England	(1) 'EUROACTION', a family-based, ambulatory, preventive cardiology programme with a whole family orientation (n=1589): group workshop & supervised exercise class for patients & partners, Family Support pack of information & advice on smoking, diet & exercise; (2) "usual care" (n=1499).	Secondary & tertiary HP (main focus); behavioural interventions (approach explicit: stages of change model); ADL, healthy eating, physical activity, self-esteem/efficacy, smoking cessation	Measures: family-based lifestyle change, management of blood pressure, lipids, blood glucose to target concentrations, prescription of cardioprotective drugs (primary). Among patients with CHD who reported smoking in the month before their cardiac event, a higher proportion in (1) were not smokers at 1 yr compared with (2); a higher proportion of patients with CHD in (1) attained the dietary targets for saturated fat intake, fruit & veg, & oily fish at 1 yr than (2); proportion of patients with CHD achieving target for self-reported physical activity at 1 yr was significantly higher in (1) than (2); other measures (e.g. cholesterol, BMI) showed no significant change. Trial carried	Moderate	Nurse-led MDT (2 cardiac specialist nurses, dietitian, PT)

						out in non-specialist centres using readily available equipment, therefore easy to roll out.		
(180)	Would a supervised programme for intermittent claudication (IC) give a significant improvement on current widespread practice of exercise advice alone? (Claudication the most common new problem referred to vascular surgeons. Disagreement over best form of exercise therapy.)	RCT	Older patients attending a regional vascular centre for whom IC was the main factor affecting mobility; NHS hospital, London (inner-city)	Mean age 68. (1) verbal & written exercise advice with a once a week 45-min supervised exercise/motivation class (n=29) over 6 months; (2) exercise advice alone (n=30). Advice was 5-10 minutes per session on the benefits of walking; motivation element was minimal.	Secondary HP (not main focus: treatment); health education (approach not explicit); physical activity.	At 6-months group (1) improved treadmill walking by 129% compared to 69% in (2), maintained at 9 & 12-month follow-up. By 9-months Charing Cross Symptom Specific Claudication Questionnaire (CCCQ) score from baseline improved 16% for (2) & 43% for (1). Self-reported frequency of walks was higher in (1) than (2).	N/A	Involved PTs (role unclear). Led by medical specialists (vascular)
(181)	To describe patients' experiences of a pre-operative programme of cardiac rehabilitation developed for those awaiting coronary artery bypass surgery (CABS). (Limited evidence regarding patients' experience & perceptions of such intervention)	Before and after study	Patients with coronary heart disease (CHD) awaiting CABS; NHS hospital, Belfast (urban)	Pre-operative cardiac rehab programme (n=8): prescription of weekly exercise; motivational interviewing to increase compliance, achieve behaviour change & modify risk factors; management of misconceptions; education on nature & causes of CHD & CABS; preparation for surgery including discussion with patient who has successfully recovered; treatment of psychological disturbances.	Tertiary HP (not main focus: cardiac rehabilitation); behavioural interventions (approach explicit); self-management, healthy eating, physical activity.	Participants found a useful means of improving exercise capacity & decreasing anxiety, and initial fear that exercise would cause a heart attack was replaced with confidence, enabling them to become fitter & modify other risk factors. Further research needed to evaluate the efficacy on risk factor modification.	N/A	Involved dietitians, PTs, clinical psychologists, nurses.

Table 12. Physiotherapy - cancer: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(182)	To foster independence, self-respect & control, while providing relief from pain, dyspnoea, nausea & fatigue. (People with cancer have multiple complex symptoms that affect the physical & psychosocial aspects of their lives)	Qualitative study	People with various types of cancer experiencing one of the 4 main symptoms; independent specialist palliative care day centre, Dorset	Semi-structured interviews (n=8, median age 66.1). The objective of rehabilitative care is to promote a partnership between the healthcare professional & the person with cancer through a coordinated approach to treatment planning & goal setting. It is a care philosophy rather than an adjunct to care. It appears to have been mainly 1-to-1, although reference to group work.	Tertiary & quaternary HP (main focus); behavioural interventions (approach explicit: holistic rehabilitative care); ADL, self-management, physical activity, self-esteem/efficacy	Patients' <i>perceived</i> QoL improved; fatigue reduced and ADL increased; patients' sense of powerlessness, perceived pain & dyspnoea reduced. More research needed to understand how some of the treatment modalities discussed can help reduce fatigue, pain, dyspnoea and nausea in this group.	Weak	Senior 1 oncology specialist PT provided education & advice; specialist palliative day care charge nurse also involved. Small-scale service evaluation. Failure to spell out content of intervention in detail.
(183)	To develop & evaluate a pilot multi-disciplinary education & support group programme for patients with fatigue post cancer treatment. (Fatigue causes major distress post treatment but little evidence about the effectiveness of	Before-and-after study (feasibility study)	Women with breast cancer; NHS Hospital, Central London (urban)	3 workshops (n=6) delivering large group support & small group discussion. Support anticipated to encourage awareness of emotional, cognitive & motivational aspects of fatigue, and increase confidence in its management. Diet, exercise, sleep hygiene, relaxation,	Tertiary HP (main focus); behavioural interventions (approach not explicit); self-management, healthy eating, physical activity, self-esteem/efficacy, other (sleep hygiene)	Main measures: Brief Fatigue Inventory, Hospital Anxiety & Depression Scale, European Organisation for Research & Treatment of Cancer QLQ C30, programme evaluation by telephone. Whilst not reducing the level of fatigue there was some evidence that impact on function was	Weak	Intervention delivered by MDT (Fatigue Management) including a dietitian, OT PT, psychologist & nurse. Very small pilot study. Evidence of effectiveness is absent. Suggestive only.

	interventions)			anxiety & lifestyle management addressed in smaller group discussions.		lessened. Cancer QoL showed improvements on some sub-scales. Sharing with others, help & advice from experts were valued most. Numbers small but findings warrant continuing service development & evaluation. Need for individual follow up, possibly by telephone.		
(184)	To evaluate a multidisciplinary specialist advisory clinic for post-operative breast care	Audit (questionnaire survey)	Patients who have undergone breast cancer surgery; hospice, South Central England (urban)	Multidisciplinary specialist advisory clinic to prevent lymphoedema, offer improved PT services & empower patients to actively participate in their own care (n=45 involved in the audit). The PT in the lymphoedema clinic provides practical advice on post-operative exercises to promote arm mobility & prevent complications.	Tertiary HP (not main focus); behavioural interventions (approach not explicit); self-management	The clinic has been a successful addition to breast care/lymphoedema services, benefiting both services & providing patient-focused education at a time requested by patients themselves.	N/A	Involved PTs & nurses

Table 13. Physiotherapy - neurological conditions: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(185)	To provide stroke survivors with aphasia, carers & families with information, support & advice. (Stroke the commonest cause of adult disability in UK. Information provision is lacking & current information may be difficult for patients with impairments such as aphasia to understand)	Qualitative study	Adult stroke survivors with aphasia and their carers; NHS Hospital stroke rehab unit London (inner-city)	7 education & advice sessions given by various members of the stroke recovery team (frequency & duration of sessions not specified)	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, self-management, health eating, physical activity, self-esteem/efficacy, sexual behaviour	76% found the information useful, relevant and easy to understand. Lack of language support (interpreters & materials) for Bengali-speaking clients identified as a barrier.	Weak	Nurse-led. MDT also included PT, OT, dietitian, SLT, pharmacist, social workers. Small scale local evaluation of a local initiative. Virtually no information on the design or execution of the evaluation.
(186)	To evaluate the effectiveness of an education programme for patients & carers recovering from stroke. (Provision of accurate information & advice is a recommended component of stroke services. Patients & carers dissatisfied with current information)	RCT	Patients admitted to stroke rehabilitation unit & carers; NHS hospital, Bradford, Yorkshire	≈60% male. (1) specifically designed Stroke Recovery Manual & fortnightly 1-to-1 education programme on rehabilitation goal setting, patient & carer information needs & increasing patient involvement in rehab process, in hospital and post discharge (patients n=84, carers n=49); (2) "usual practice" (patients n=86, carers n=48).	Secondary & tertiary HP (main focus); behavioural interventions (approach explicit); self-management.	Measures: knowledge of stroke & stroke services (primary), London Handicap Scale, physical function (Barthel Index), social function (Frenchay Activities Index), mood (Hospital Anxiety & Depression Scale), satisfaction (Pound Scale), carer mood (General Health Questionnaire-28). No statistical evidence for treatment effect on knowledge but trends	Weak	Led by MDT including OT, PT, doctor & nurse (specialties not specified).

						that favoured (1). (1) associated with significantly greater reduction in anxiety at 3 & 6 months & consequently fewer 'cases'. No other significant differences between patient or carer groups for other outcomes, though trends favour (1).		
(187)	To test a home-based educational intervention in reducing incidence & risk of falls & pressure sores in adults with progressive neurological conditions. (This group is at risk of avoidable complications such as falls & skin sores. Falls can be prevented by identifying & modifying risk factors though no evidence for skin sore prevention)	RCT	People with progressive neurological conditions (Parkinson's disease & multiple sclerosis); patients' homes, Nottingham (urban, suburban)	(1) home-based education (n=57): an expert panel advised on actions most likely to promote individuals' physical, social & psychological well-being. An OT visited participants to provide education & information & discuss a personalized 12-month health action plan; (2) standardised printed information delivered to patients' homes (n=57).	Tertiary HP (main focus); behavioural interventions (approach explicit); ADL.	Measures: numbers of participants reporting falls & skin sores at 2-monthly phone calls during 12-month follow-up period. Significantly more falls & skin sores during follow-up & at 12 months reported in (1) compared to (2). No difference in Extended ADL score. Person-centred education for this group can have negative effects & in some circumstances may even be harmful. This group needs preventive health care but assumptions about benefits of education & self-management interventions require empirical testing.	Weak	OT-led. Expert panel consisted of a research OT, consultant in neurology & rehabilitation medicine, GP, social worker, SLT, PT & nurse.

Table 14. Physiotherapy - diabetes: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(188); (189)	To measure effectiveness of a dietitian-led weight management programme for Type 2 diabetes (T2D) patients taking insulin. (Problem of managing weight gain among T2D patients commencing insulin therapy)	RCT	Patients with T2D receiving insulin treatment for <1 year; NHS hospital, East of England	(1) 'Weight No More' programme (n=29): 8 fortnightly small group sessions of 1-1.5 hours (claimed emphasis on behavioural techniques & education, goal setting, exchange of experiences, motivational approaches in an 'informal' 'fun' learning environment; (2) standard diabetes care (n=20) (appointment with dietitian on annual basis)	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL (menu planning, shopping, cooking, eating behaviours & choices); self-management (blood glucose monitoring, insulin dosage adjustment); healthy eating, physical activity	Measures: Audit of Diabetes-Dependent QoL, weight, HbA1c (blood glucose) level, insulin dose. QoL: no differences at 4, 10 or 16 months between groups; weight: (1) achieved statistically significant reduction in weight at 4, but no difference at 10 & 16; blood glucose: both groups significantly reduced at 4, but no difference at 10 & 16; insulin usage: decreased significantly for (1), but no differences at 10 & 16. Short-term benefits in weight & blood glucose but no benefits longer term. Further research needed to establish weight maintenance strategies & cost-effectiveness.	Weak	Dietitian-led; session on exercise run by PT; also involved diabetes specialist nurse. Limited generalisability because of uncertainty over refusals, non-blinding, external validity. Costs analysis included.
(190)	To evaluate the effectiveness of lifestyle interventions in people with	RCT	Participants aged 24-75 with IGT; NHS hospital, Newcastle	(1) 2-year lifestyle intervention (n=39): motivational interviewing to develop an individual action plan for behaviour	Secondary HP (main focus); behavioural interventions (approach explicit: 'stages of change')	Measures: nutrient intake, physical activity (lifestyle questionnaire), anthropometry,	Weak	Delivered by dietitian (motivational interviewing) and PT (physical

	impaired glucose tolerance (IGT). (Strategies urgently needed to reduce cardiovascular risk in high risk individuals)			change, encouragement to eat healthily, nutrition education material, graded physical activity plan; (2) no dietary or activity advice offered during study (n=39).	model); healthy eating, physical activity, self-esteem/efficacy	glucose tolerance, insulin sensitivity. At 6, 12 & 24 months: dietary fat intake decreased more in (1) than (2); mean difference in change in total fat intake between groups was significant; reported regular activity significantly higher in (1). However, no difference in observed exercise tolerance. Body mass reduced significantly more in (1). Fasting serum insulin was reduced at 6 & 12 but not at 24 months.		activity plan)
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Table 15. Physiotherapy - other target groups: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(191)	To describe levels of obesity for adults supported by learning disability services, & to evaluate the effectiveness of health practitioner input with individuals with learning disabilities. (People with learning disabilities at high risk of obesity & consequent health risks)	CCT (non-randomised)	Adults with learning disability; 3 day resource centres, North West England	(1) "input group" receiving individual support from a "healthy living coordinator" to improve healthy living (n=38): home visits, advice, activity programs, HP material; (2) "non-input group" not receiving such support (n=50).	Secondary HP (main focus); behavioural interventions (approach explicit); healthy eating	Measure: Body Mass Index (BMI). Initially 35% of group (2) was classified as clinically obese. Mean BMI increased over time for the group (2) at first, but decreased for group (1). Differences in weight change between groups reached statistical significance with a greater weight reduction in group (1).	Weak	PT-led.
(192)	To compare a community-based, lay-led walking scheme versus advice only on physical activity & cardiovascular health status in middle aged adults.	RCT	Men & women aged 40-70, taking <120 minutes of moderate intensity activity per week; primary care and community, South Central England (urban)	(1) 'Health walks', a community-based, lay-led walking scheme, plus a standardised advice session (n=131); (2) advice session only (n=129).	Primary HP (main focus); behavioural interventions (approach explicit); physical activity	Measures: physical activity (based on Stanford 5 Cities physical activity questionnaire), cardiovascular fitness, blood pressure, BMI, etc. No significant differences in self reported physical activity at 12 months when analysis was by intention to treat. Among completers, (1) was more effective than (2) in increasing moderate intensity	Weak	Independent researcher-led; advice session led by a PT; nurses also involved.

						activity above 120 mins per week. Lay-led walking programmes may offer cheap & effective physical activity promotion in primary care.		
(193)	To determine whether OT can enhance QoL by educating older people about the risk of falls. (Falls common in older people & associated with mortality, decreased mobility & reduced ability to perform ADL. Little research on OT falls prevention programmes)	Before-and-after study (quantitative)	People aged 65+; day care centre, primary care, residential care, Hounslow, outer London (urban).	Multifaceted falls prevention programme (14 sessions over 3 months) to enhance QoL (n=172): exercise programme (45 mins) & education focused on the risks/causes & prevention of falls.	Secondary HP (not main focus); behavioural interventions (approach not explicit); ADL, self-management, physical activity.	Measure: QoL (non-standardised self-administered questionnaire devised by the authors). Programme can reduce impact of falls on older people by enhancing confidence to perform activities, which can increase QoL. Further research needed on effectiveness of anxiety management techniques & ascertain why older people may refuse to participate. Funders of falls services should ensure that prevention strategies based on best practice and cost-effective.	N/A	Education session led by the OT, PTs & podiatrists. Author-devised QoL measure.
(194)	Can a outpatient renal rehabilitation programme achieve significant improvements in exercise capacity, functional ability & QoL in patients with chronic kidney	Before and after study	Outpatient renal rehabilitation patients with CKD; NHS (?) hospital, London	12 weeks of twice-weekly supervised exercise & education sessions, & once-weekly specific home exercises (n=30, 13 male, 17 female).	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, physical activity	Increased fitness & muscle strength makes ADL easier, as demonstrated by significant improvements in the Duke's Activity Status Index score, & enables some people to	N/A	PT-led

	disease (CKD)? (Exercise not routinely advocated in renal disease compared with best practice in other diseased populations)					increase return to activities that they enjoy such as walking or playing sport. Preliminary experience suggests that significant improvements in exercise capacity and physical functioning can be achieved in CKD patients with a supervised outpatient exercise programme.		
(195)	To examine the role of changes in dialysis prescription, individualized dietary input & exercise on body weight & composition. (Patients on peritoneal dialysis (PD) exposed to glucose-based dialysate solutions with risk of obesity & health problems)	Prospective cohort study (described as "prospective interventional study")	Patients on PD >3 months with BMI >25 & deemed medically fit to undergo an exercise programme; NHS hospital, Cambridge (urban)	1-year intervention to support, educate, & encourage patients in a weight-reduction program (n=12). Meetings included diet, exercise, assessment & advice.	Tertiary HP (main focus); behavioural interventions (approach explicit); healthy eating, physical activity	Significant fall in median body weight at 6 & 12 months. No significant changes in total body water, lean body mass, or % body fat. Use of informal group setting motivated patients to continue with exercise & sensible eating patterns. With adequate support, PD patients can achieve & maintain weight loss.	N/A	Dietitian-led; intervention integrated the care of renal nurse, renal dietitian & PT.
(196)	To provide an introduction to safe, effective exercise, increase participants' knowledge of osteoporosis & identify long-term strategies to increase physical activity. (Regular exercise a	Before and after study	Older people with osteoporosis; Glasgow (setting not specified)	Exercise & education programme (n=700, mean age 75). Aims to provide an introduction to safe, effective exercise in a supportive environment, increase participants' knowledge of osteoporosis & assist in identifying long-term	Tertiary HP (main focus); behavioural interventions (approach not explicit); self-management, physical activity, self-esteem/efficacy	Statistically significant improvements in aerobic capacity, balance & posture. Questionnaire responses describe participants feeling fitter, stronger, able to do more in day-to-day life & motivated to	N/A	PT-led (no data on numbers, status, training, experience etc.)

	valuable component in managing osteoporosis)			strategies to increase physical activity.		keep exercising.		
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5 Dietitians

5.1 Profile of the profession

Dietitians translate scientific information about food into practical dietary advice and options for clients, patients, carers and colleagues using a broad range of disciplines such as communication behaviour change and pharmacology (197). As well as providing advice about nutrition and health, dietitians also advise about food related problems and treat disease and ill health.

Dietitians work across all age groups, many care pathways and in a great variety of organisations and settings. Within the NHS, this includes mental health, learning disabilities, community, acute and public health (198). They also work in private practice, the food industry, education, research, sport, media, public relations, journalism, NGOs and government. They may specialise in a number of areas, such as diabetes, children's health and cancer.

Dietitians work within multi-disciplinary teams to treat complex clinical conditions such as eating disorders, chronic fatigue, irritable bowel syndrome and diabetes. They provide advice to caterers to ensure nutritional care of all clients in NHS and care settings and plan and implement public health programmes to promote health and prevent nutrition related disease. A key role is the education and training of other health and social care workers.

Dietitians are legally able to supply and administer prescription only medicines, such as insulin, phosphate binders and pancreatic enzymes, through patient group directions (198). They can also adjust medication through locally governed Trust protocols.

Dietetics is a relatively small allied health profession (the seventh largest). There are only 6,700 HPC-registered dietitians in the UK (49), around 3,700 of whom are employed within the English NHS (43). The professional body is the British Dietetic Association.

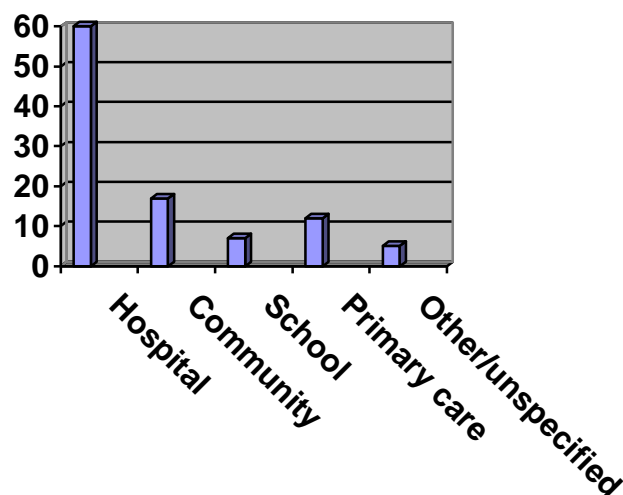
5.2 Results from the systematic review

Forty-two studies met the criteria for inclusion in the review and have been divided into 6 groups (see Table 16 to Table 21): diabetes (13 studies), obesity (9), dialysis patients (6), pulmonary rehabilitation (3), heart disease (3) and other target groups (8).

The majority of interventions were targeted at adults, typically with highly specific nutritional needs as a consequence of an existing condition (such as diabetes or renal failure). The range of conditions targeted appears to

reflect the diversity of dietitian practice, with possibly a bias towards hospital specialties. Dietitians are honourable exceptions to the rule that the overwhelming majority of interventions we identified were blinkered to ethnicity, in that one specifically targeted South Asians and a further two reported special arrangements to accommodate them (Urdu translations of information materials, or interpreters). As Figure 6 (below) shows, study settings were also diverse, although again clinical settings predominated (hospital and primary care combined accounted for two-thirds (67%) of the interventions. The relatively low numbers of interventions in schools and other community settings is perhaps surprising. 17% of interventions took place in some type of community setting (interestingly dietitians provide our only two examples of interventions occurring in supermarkets), but despite this only one adopted a community development approach. Otherwise, the majority consisted of individualistic information and advice giving and/or behavioural interventions that focused on the scientific nutrition needs of specific groups of patients with highly specialised conditions/health needs. 91% of the interventions were at either Secondary (36%) or Tertiary (55%) levels.

Figure 6. Dietitian interventions by study settings (%)



Based on the evidence of this review, relatively little health promotion effort involving dietitians appears to be targeted at improving the diet of healthy individuals or communities. However, this may simply be an artefact of the difficulties of fitting this type of research into what appears to be the dominant dietitian research paradigm (see below), and (possibly) lower levels of research awareness and skills among community dietitians. Almost two-thirds of these interventions were dietitian-led, regardless of whether they took place in a hospital or elsewhere. Of the eight (19%) interventions that were lead by another professional, in all but three instances, the lead was a doctor. Nurses and other AHPs, it would appear, rarely lead dietitians.

In terms of the studies themselves, 34 (81%) had health promotion as the prime focus, a significantly higher proportion than OTs (59%). Despite this, just over half (52%) were RCTs, followed by Before and after studies (36%), and Others (12%). It was noticeable that only one study adopted a qualitative methodology. This markedly different distribution of study types, compared with OT, is consistent with the common perception of dietetics as one of the AHPs where the biomedical paradigm predominates research (and perhaps practice). Of the 34 papers subjected to full quality evaluation, one (3%) was rated as 'Strong', four (12%) as 'Moderate' and the remainder as 'Weak'.

Table 16. Dietetics - diabetes: included studies

Main ref; other refs.	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(199)	To ascertain whether a dietitian-led intensive lifestyle intervention can attenuate weight gain associated with commencing insulin therapy. (Need to reduce weight gain associated with commencement of insulin therapy)	RCT	Patients with Type 2 diabetes (T2D) <4 weeks of starting insulin therapy; tertiary dialysis clinics, South East England	(1) intensive lifestyle intervention, seen 6 times over 6 months (n=25): dietary & exercise information supplemented by motivational interviewing, patient empowerment, support & advice; individualised targets agreed; patients given knowledge & skills to understand their personal energy requirements & how to buy & prepare food to reduce energy intake; (2) standard care (n=25) (annual review, contact with diabetes specialist nurses & referral to other professionals if needed).	Tertiary HP (main focus); behavioural interventions (approach explicit); healthy eating, physical activity, self-esteem/efficacy	Measure: weight change (primary). Over 6 months (2) gained 4.9kg; (1) maintained their weight. Difference in weight change between groups was 5.5kg. (2) had significant increases whilst the (1) had slight decreases in: BMI, waist circumference & % body fat. Differences between groups for these parameters were significant. Both groups experienced significant reductions in HbA1c but only minor changes in blood lipids. Weight gain is not an inevitable consequence of starting insulin therapy but attenuation of the weight gain requires a high level of intervention. The	Weak	Dietitian-led. Unblinded; selection bias; high refusal rate (59%) suggests low public acceptability.

						first 6 months to 1 year provides the ideal 'window of opportunity'.		
(200)	To compare differences in weight loss of: 1) dietitian-led 'Lifestyle' clinic and 2) 1 plus sibutramine among obese women with and without Type 2 diabetes (T2D). (Weight loss believed to be more difficult for people with T2D)	Case-control study	Working age obese women with & without T2D; NHS hospital, West London (urban)	Mean age 40. Group (1) women with T2D (n=18); (2) women without T2D attending a 6-month 'Lifestyle' intervention (n=20): 26-week programme of 6 dietitian consultations + 5 phone calls of support, goal setting & progress reviewing (total 340 minutes); (3) for those in (2) who had failed to reach weight loss goals, the addition of sibutramine.	Secondary (obesity) & tertiary (diabetes) HP (not main focus: interaction between HP & sibutramine; behavioural interventions (approach not explicit); healthy eating, physical activity	Measure: weight change. In the 'Lifestyle' treatment groups, those with T2D lost significantly less weight than those without. Addition of sibutramine (3) resulted in similar weight loss compared to their pair-matched 'Lifestyle' only 'successful' counterparts. Not all obese women, & those with T2D in particular, will benefit from 'Lifestyle' advice & those who are resistant to this approach may be assisted by pharmacotherapy. Dietitians can play a role in identifying those who may benefit from pharmacotherapy.	Weak	Dietitian-led; hospital doctors initiated prescription of sibutramine; GPs (ongoing prescription)
(188); (189)	To measure effectiveness of a dietitian-led weight management	RCT	Patients with T2D receiving insulin treatment for	(1) 'Weight No More' programme (n=29): 8 fortnightly small	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL (menu planning,	Measures: Audit of Diabetes-Dependent QoL, weight, HbA1c (blood glucose)	Weak	Dietitian-led; session on exercise run by PT; also

	programme for Type 2 diabetes (T2D) patients taking insulin. (Problem of managing weight gain among T2D patients commencing insulin therapy)		<1 year; NHS hospital, East of England	group sessions of 1-1.5 hours (claimed emphasis on behavioural techniques & education, goal setting, exchange of experiences, motivational approaches in an 'informal' 'fun' learning environment; (2) standard diabetes care (n=20) (appointment with dietitian on annual basis)	shopping, cooking, eating behaviours & choices); self-management (blood glucose monitoring, insulin dosage adjustment); healthy eating, physical activity	level, insulin dose. QoL: no differences at 4, 10 or 16 months between groups; weight: (1) achieved statistically significant reduction in weight at 4, but no difference at 10 & 16; blood glucose: both groups significantly reduced at 4, but no difference at 10 & 16; insulin usage: decreased significantly for (1), but no differences at 10 & 16. Short-term benefits in weight & blood glucose but no benefits longer term. Further research needed to establish weight maintenance strategies & cost-effectiveness.		involved diabetes specialist nurse. Limited generalisability because of uncertainty over refusals, non-blinding, external validity. Costs analysis included.
(201)	To help newly diagnosed diabetics acquire the knowledge, skills & attitudes required to successfully manage their diabetes. (People newly diagnosed with	Before and after study (qualitative)	Adults recently diagnosed with diabetes & their carers; public libraries, North West England (mixed urban/rural)	A selection of books, magazines, videos and leaflets available for loan in 19 public libraries allow health professionals to direct the patients to materials that	Tertiary HP (primary focus); health education (approach not explicit); ADL, self-management, healthy eating.	Measures: 2 questionnaires (borrowing information; knowledge & understanding of diabetes based on Charing Cross Hospital Dept of	Weak	Dietitian-led; chiropodists and practice nurses also involved in publicising the initiative to their patients. Also involved

	diabetes want information & support to help them acquire the knowledge & skills to successfully manage their diabetes)			are suitable for them (n=65 audit respondents: 22 borrowers (73% female), 43 non-borrowers). Materials focused on dietary information and advice. Available in Asian languages, in large print & on audiotape.		Endocrinology Non-Insulin Dependent Patient Questionnaire. Knowledge & understanding of diabetes, its treatment & self-care: borrowers appeared to have improved their knowledge 10% more than non-borrowers. Problems included influencing behaviour of health professionals and library resource issues. Claimed to be cost effective.		librarians. A well designed study but reliability significantly reduced by failure to recruit sufficient numbers. Findings are suggestive only.
(202); (203-205)	To evaluate whether a course teaching flexible intensive insulin treatment combining dietary freedom & insulin adjustment can improve both glycaemic control & QoL in Type 1 diabetes (T1D). (Self management essential to successful treatment of T1D, yet few patients alter their insulin from day to day or achieve the	RCT ("waiting list controlled trial")	Adults with T1D and moderate or poor glycaemic control; NHS secondary care diabetes clinics in 3 English health districts	(1) a 5-day training course on flexible intensive insulin treatment combining dietary freedom & insulin adjustment (Dose Adjustment for Normal Eating - DAFNE) (n=84); (2) usual care for 6 months then (1) (n=85). DAFNE used principles of adult education with explicit learning objectives in a group setting.	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, healthy eating, self-esteem/efficacy	Measures: HbA1c (blood glucose) level, QoL (Audit of Diabetes-Dependent QoL) (primary), Diabetes Treatment Satisfaction Questionnaire, psychological wellbeing (W-BQ12), weight, blood pressure, insulin dose. At 6 months HbA1c significantly better in (1) than (2). Impact of diabetes on dietary freedom	Weak (RCT); Strong (qualitative)	Led by diabetic physician; dietitians & nurses involved in delivery. Cost-utility analysis carried out (206,207).

	degree of glycaemic control known to be ideal.)			Aims: build confidence & autonomy, acquire skills & confidence to adjust insulin to suit lifestyle rather than being told to adapt the timing & content of meals to more fixed doses of insulin.		significantly improved in (1) compared with (2), as was impact of diabetes on overall QoL. General wellbeing & satisfaction also significantly improved but severe hypoglycaemia, weight & lipids unchanged. Skills training improved QoL & glycaemic control in people with T1D without worsening severe hypoglycaemia or cardiovascular risk. Follow-up relatively short so need to establish whether similar results can be achieved in routine care & devise ways of sustaining improvement in glycaemic control.		
(208)	To compare effects on weight loss of standard treatment vs. new Lifestyle Clinic incorporating pharmacotherapy. (Obesity on the increase yet within	Case-control study	Adult subjects with Type 2 diabetes & BMI ≥ 28 invited to attend Clinic, as were non-diabetic	(1) "Lifestyle Clinic" (n=103): 26-week programme of dietitian consultations, support phone calls, offer of	Secondary HP (main focus); behavioural interventions (approach not explicit); healthy eating, physical activity	Measures: BMI, waist circumference, blood pressure, exercise tolerance (shuttle walking test), HbA1C, etc. Weight loss 7.1%	Weak	Dietitian-led. Only 26/103 completed; 64/103 either discharged or failed to achieve 2.5kg target for first 4

	the NHS treatment approaches differ greatly & service is patchy)		subjects with BMI>=35; NHS hospital, London (inner city)	pharmacotherapy if appropriate & emphasis on achieving realistic weight loss of 10%. CBT strategies & goal setting focusing on achieving changes in dietary intake & physical activity levels; (2) age & sex matched controls receiving standard care (5 dietitian consultations), drawn from clinic records.		(1) vs. 1.7% (2). Benefit of (1) on exercise tolerance, waist measurement & cholesterol. Lifestyle clinics facilitate beneficial lifestyle changes which impact positively on morbidity risk factors demonstrating an improvement on current service offered within NHS. Obvious resource implication of offering intensive management package. Need for RCT to evaluate whether there is cost benefit from this type of intervention.		weeks, which suggests low acceptability.
(209); (210)	To assess the effectiveness of a brief psycho-educational intervention for people with Type 1 diabetes (T1D). (Intensive 5-day educational interventions have shown improved outcomes in a number of European	RCT	Adults with T1D attending a specialist diabetes service; NHS hospital, York.	(1) BITES (Brief Intervention in T1D, Education for Self-efficacy) (n=54): 2.5 days psycho-education covering: understanding carbohydrates & diet, understanding insulin adjustment & giving patients the skills &	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management	Measures: HbA1c, severe hypoglycaemia (primary), blood pressure, weight, height, lipids, 221-item psychosocial & knowledge questionnaire. HbA1c in (1) showed no statistically significant change	Moderate	Dietitian involved in delivery. Developed by consultant diabetologist, diabetes specialist nurse, specialist diabetes dietitian & clinical health psychologist

	studies)			confidence to self-manage diabetes; (2) standard care (n=60).		at 3, 6 & 12 months. Incidence of severe hypoglycaemia in both groups not statistically different. Treatment satisfaction improved at 3, 6 & 12 months. Significant improvement in 'Managing psychological aspects' & 'Setting and achieving goals' dimensions of the Diabetes Empowerment Scale at 3, 6 & 12 months. Diabetes Knowledge Test, Illness Perception Questionnaire, Hypoglycaemia Fear Scale & SF-36: no significant change.		
(211)	To examine the application of a Transtheoretical model (TTM) of change approach to increase physical activity in people with type 2 diabetes (T2D) by a specialist dietitian. (TTM is an approach to behaviour change	RCT	Adults (34-75) with T2D; NHS hospital, London (urban)	(1) physical activity leaflet + 1-to-1 exercise consultation interview (n=20) aiming to initiate physical activity & develop & facilitate strategies to assist in maintenance of exercise behaviour; once physical	Tertiary health promotion (main focus); behavioural interventions (approach explicit: TTM); self-management; physical activity	Measures: Physical Activity Questionnaire, BMI. Both groups showed an increase in physical activity levels. However, there was a significant difference in change of physical activity levels in group (1)	Weak	Led by specialist dietitian trained in TTM-based counselling and motivational interviewing and the provision of physical activity advice; hospital doctors also

	which has been successful in increasing physical activity levels)			activity options established, short-term goals were set & participants given these in writing; (2) physical activity leaflet only (n=20).		alone.		involved.
(212)	To dispel common myths surrounding the diabetic diet and to explain how healthy eating for people with diabetes follows the same guidelines as for the general population. It was also to market Flora Pro-Activ. (For consumers with medical conditions that are influenced by diet, compliance with dietary & lifestyle advice is important to reduce risk of adverse consequences)	Before and after study (qualitative)	People with high cholesterol or at risk of diabetes; 215 Sainsbury's stores across the UK.	Free guided store tours, each with up to 10 consumers: 15-min presentation by a dietitian, reviewing risk factors & healthy eating; store tour highlighting suitable food choices & product types (allowed reference to real food examples when explaining dietary messages); Q&A session; information packs about diet, lifestyle, food labelling & a shopping guide.	Primary HP (main focus); health education (approach not explicit); healthy eating	Measure: "evaluation forms" completed by consumers, dietitians & tour organisers. Forms completed by 459 consumers (estimated 43% of total attendees). 77% identified dietary changes that they could personally make to help maintain a healthy heart, including eating less fat & more fibre, altering portion sizes & reading product labels. Purchases of 'healthier' spreads increased significantly, however spending on fruit and vegetables reduced (12%). Dietitians & organisers evaluated the	Weak	Tours delivered by 185 dietitians organised by Sainsbury's & Unilever. Initiative associated with launch of Flora Pro-Activ 'cholesterol lowering' spread.

						intervention positively.		
(213)	To enable people with Type 1 diabetes (T1D) to self-manage. (Need for outpatient alternative to NICE-recommended inpatient education programme for people with T1D to enable them to self-manage)	Before and after study (qualitative)	People with T1D; NHS hospital Depts of Diabetes and Dietetics, Gloucester	'Re-Education And Carbohydrate Counting Training' (REACCT): 2 x 2-hour morning sessions, 6 weeks apart. Each group contained 5-10 patients. Topics included back to basics insulin education & lifestyle issues (no patient data; n=80 patients completed the programme).	Tertiary HP (main focus); behavioural interventions (approach explicit: Bandura's Social Learning Theory); ADL, self-management, healthy eating, physical activity, self-efficacy	Measures: "self-perceived" QoL (presumed author-devised), HbA1c, insulin dose. 56% reported improved QoL; 44% reduced total insulin dose; 63% improved glycaemic control with fewer glycaemic excursions; mean HbA1c reduced from 8.37% to 8.28% after completion. Costs also estimated.	Weak	Led by consultant; delivered by specialist nurse & diabetes specialist dietitian.
(214)	To assess whether a secondary-primary care education package could improve knowledge & self-care skills among South Asian patients with Type 2 diabetes (T2D). (T2D more prevalent in South Asians in Britain, although rates in all groups in inner cities seem to be rising as populations age)	RCT (randomised by GP practice)	South Asian adults with T2D; primary care (inner-city Manchester)	(1) secondary-primary care 1-to-1 education to improve patient knowledge & self-care skills (n=108): clinic sessions 4 times over the year. Urdu & Punjabi-speaking health professionals or interpreters at each session; (2) routine care (n=103).	Tertiary HP (main focus); health education (approach not explicit); self-management, healthy eating	Measure: interview on knowledge, awareness & self-management of diabetes using 94-item semi-structured questionnaire (based on validated tools). Despite a mean of 4 visits/patient, (1) had no impact on diabetes knowledge, awareness or self-management at 1 yr (though drop-out rate very high). (1) did not transfer	Weak	Patients seen at least once by each of diabetes specialist nurse, dietitian or podiatrist alongside a practice nurse.

						information effectively & similar problems likely to arise in other similar communities. Different methods of clinician/patient information exchange need to be developed for this group.		
(215); (216-218)	To pilot an educational programme for children 11-16 with Type 1 diabetes (T1D). (Multiple daily injections do not necessarily improve control unless introduced in parallel with structured education)	Before and after study (qualitative)	Children aged 11-16 with T1D; local secondary schools (Sheffield & Derby) or an education centre (Manchester) (urban)	KICK-OFF programme (n=48): 6x5-day outpatient courses on carbohydrate counting & insulin dose adjustment were held: various classes, workshops and activities.	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, healthy eating	Measures: semi-structured interviews (expectations & worries (pre) & perceived advantages & disadvantages (post)), glycaemic control (HbA1c), BMI, frequency of hypoglycaemia, QoL (various validated tools). No changes in HbA1c, BMI or episodes of hypoglycaemia, but children & parents reported improved QoL. Course format was appropriate & consistent. Pre-course expectations were largely met. Findings justify conducting a future RCT involving a	Moderate	Dietitians involved in delivery; nurses also involved (unclear who led)

						revised curriculum, larger study population, longer follow-up & health economics analysis.		
(190)	To evaluate the effectiveness of lifestyle interventions in people with impaired glucose tolerance (IGT). (Strategies urgently needed to reduce cardiovascular risk in high risk individuals)	RCT	Participants aged 24-75 with IGT; NHS hospital, Newcastle	(1) 2-year lifestyle intervention (n=39): motivational interviewing to develop an individual action plan for behaviour change, encouragement to eat healthily, nutrition education material, graded physical activity plan; (2) no dietary or activity advice offered during study (n=39).	Secondary HP (main focus); behavioural interventions (approach explicit: 'stages of change' model); healthy eating, physical activity, self-esteem/efficacy	Measures: nutrient intake, physical activity (lifestyle questionnaire), anthropometry, glucose tolerance, insulin sensitivity. At 6, 12 & 24 months: dietary fat intake decreased more in (1) than (2); mean difference in change in total fat intake between groups was significant; reported regular activity significantly higher in (1) but no difference in observed exercise tolerance. Body mass reduced significantly more in (1). Fasting serum insulin reduced at 6 & 12 but not at 24 months.	Weak	Delivered by dietitian (motivational interviewing) and PT (physical activity plan)

Table 17. Dietetics - obesity: included studies

Main ref; other refs.	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(219); (220-222)	To determine whether a generalizable best-practice individualized behavioural intervention reduced BMI z score relative to standard dietetic care among overweight children. (Rapid rise in childhood overweight has had significant adverse effect on physical & psychosocial health of children)	RCT	Overweight primary-age children (BMI \geq 98th centile); NHS hospital, Glasgow (urban)	59 male, 75 female. Scottish Childhood Overweight Treatment Trial (SCOTT). (1) 26-week (5 hours contact time) best-practice behavioural program (n=69): 1-to-1 family-centred counselling & behavioural strategies (child & family taking control of lifestyle changes) to modify diet, physical activity & sedentary behaviour; (2) typical "very low intensity" dietetic care (n=65).	Secondary HP (main focus); behavioural interventions (approach explicit); self-management, healthy eating, physical activity	Measures: BMI z score (primary), weight, objectively measured physical activity & sedentary behavior, fat distribution, Pediatric QoL Inventory 4.0. No significant effect for (1) relative to (2) on BMI z score at 6 & 12 months. z score decreased significantly in both groups at 6 & 12 months. For those who complied with treatment there was a significantly smaller weight increase in those in (1) compared with (2) at 6 months. Significant between-group differences in favour of (1) for changes in total physical activity, % of time in	Weak	Delivered by experienced paediatric dietitians trained in behaviour change counselling.

						sedentary behaviour & light-intensity physical activity. Modest benefits indicate longer-term & more intense intervention, though such treatments may not be realistic for many health care systems.		
(223)	To provide clients with the skills & knowledge to promote weight loss and weight maintenance. (Increase in obesity & health complications & costs)	Before and after study (qualitative)	Attendees at a weight loss information programme; unspecified setting (delivered by PCT), Waltham Forest	6 weekly 1.5 hour group classes (n=11) covering healthy eating principles, physical activity advice & behaviour change, including goal setting.	Secondary HP (main focus); behavioural interventions (approach not explicit); healthy eating, physical activity	Measures: "simple questionnaire" & informal feedback, weight, waist circumference. Mean weight loss was 2.25kg, waist reduction 3.5cm. Participants reported feeling more motivated & confident that they would succeed with their goals. They also valued the long-term support provided by the service. Recommended that the programme be expanded to target health inequalities in the borough. This had happened (as of	Weak	Led & delivered by senior community dietitian.

						2008) and uptake increased.		
(224)	To promote healthier lifestyles to families with obese or overweight children by increasing awareness of obesity & boosting child's self-esteem. (Childhood obesity associated with adverse health outcomes)	Before and after study (quantitative)	Children 4-16 at 91 st -98 th BMI centile; local specialist children's gym in Community College, East Midlands	Weekly supervised exercise sessions, home exercise & diet plans.	Secondary HP (main focus); behavioural intervention (approach explicit); healthy eating, parenting behaviour, physical activity, self-esteem/efficacy	Measures: self-esteem (Rosenberg questionnaire), fruit & veg intake (food diaries), physical activity, exercise test, BMI, weight, height, waist, etc. 84% increased self-esteem; 7/15 improved fitness by average of 33%; 80% reported increasing fruit & veg intake; 80% reported being more active; 60% slightly decreased BMI; 40% slightly increased BMI. Over half of parents reported changing their own lifestyle.	Weak	Led by PH specialist. Also involved dietitian (planning & delivery) paediatrician, health visitors, school nurse, learning disabilities support worker & 'trainers'.
(225); (226-228)	To evaluate a training programme intended to improve the management of obesity, delivered to GP teams. (Obesity a major public health	Cluster RCT; qualitative study	Health professionals were targeted by the intervention; obese adults were the ultimately affected population;	44 GP practices (22 per arm). (1) 4.5-hr training programme (n=415) promoting a brief, prescriptive approach to the treatment of obesity through lifestyle modification, intended to be	Secondary & tertiary HP (main focus); behavioural interventions (approach explicit); self-management, healthy eating.	Measures: weight (primary), practitioners' knowledge & behaviour in obesity management (author-devised questionnaire). At 12 months (1)	Weak (RCT); Moderate (qualitative)	Dietitians led the training of staff in GP practices; GPs, nurses & midwives also involved.

	problem; evidence shows that diet, exercise & behavioural approaches used in combination can be effective at least in the short term)		primary care, Northern England.	incorporated into routine clinical practice; (2) "usual care" (n=428)		patients were 1kg heavier than (2). Evidence of improvement in practitioners' knowledge. Some aspects of the model, including recording weight, target weight & dietary targets, occurred more frequently in (1) practices after training, but in absolute terms levels of implementation were low. Other strategies to manage obesity in primary care urgently need to be considered & evaluated.		
(229)	To implement and evaluate a primary care dietitian-run weight management programme. (Obesity is a growing problem. Treatment options and availability of resources are limited &	Before and after study (quantitative)	People with BMI>30 & coronary heart disease risk factors; 3 health centres, Nottingham City PCT (urban)	7x2-hr education & support group sessions (n=216); further sessions at 4, 6, 9 & 12 months. Variety of teaching methods used to encourage participation & personal goal setting.	Secondary & tertiary HP (main focus); behavioural interventions (approach not explicit); self-management, healthy eating, physical activity	Measures: BMI, waist, body fat, blood pressure, lipids, HbA1c, psychological wellbeing (SF-36). 4% of patients achieved a 10% weight loss & 13% achieved 5-10%. Those continuing to attend achieved mean weight loss of 2.9% at 3	Weak	Dietitian-led; nurses also involved.

	inconsistent)					months, maintained at 12. Waist circumference, body fat, systolic blood pressure, total cholesterol, HbA1c & triglycerides reduced. Psychological wellbeing improved. A group programme should be offered as an option for obesity management. A 66% dropout rate showed that retention & follow-up was difficult. Further work needed to establish training & resources required by primary care to run effective weight management programmes.		
(230); (231)	Pilot to assess the acceptability, feasibility & compliance of a programme to improve health outcomes in obese children.	Before and after study (qualitative)	Obese children aged 7-11 & their families; sports centre, London	Community-based childhood obesity treatment programme (Mind, Exercise, Nutrition & Diet - MEND) twice-weekly over 3 months (n=11	Secondary HP (main focus); behavioural interventions (approach not explicit); healthy eating, physical activity, self-esteem/efficacy	Measures: waist circumference (primary), BMI, cardiovascular fitness, self-esteem (scale not stated), body composition,	Weak	Dietitian-led. Findings encouraging but should be regarded as suggestive only. RCT (too recent for

	(Lack of good evidence on the effectiveness of interventions on which to base national strategies or inform clinical practice)			children & families). Group sessions: 8 nutrition focussed education, 8 behavioural modification, 18 fun-based physical activity.		parents' BMI. Waist circumference, BMI, cardiovascular fitness & self-esteem improved significantly; benefits sustained at 3 months; significant improvement remained between baseline & 6 months for all parameters except BMI. Although limited by small numbers and no control, MEND was acceptable to families.		inclusion) later carried out (231).
(232); (233,234)	To assess if a school based intervention was effective in reducing risk factors for obesity. (Increasing obesity in children)	RCT	Children aged 7-11; 10 primary schools (5 per arm), Leeds (urban)	(1) "Active programme promoting lifestyle in schools" (APPLES) (n=314): 1-year multidisciplinary, multi-agency programme designed to influence diet & physical activity, not just knowledge. Teacher training, modification of school meals & development of	Primary HP (main focus); behavioural interventions (approach explicit); healthy eating, physical activity, self-esteem/efficacy	Measures: BMI, dietary information (24-hr recall & food diaries), physical activity (questionnaire), psychological measures (3 validated tools, e.g. Self Perception Profile for Children). Veg consumption higher in (1) than (2). Fruit consumption lower	Weak	Dietitian-led; hospital doctors also involved.

				school action plans targeting the curriculum, physical education, tuck shops, & playground activities; (2) "usual health curriculum" (n=322)		in obese children in (1) than (2). Higher consumption of high sugar foods among overweight children in (1) than (2). Sedentary behaviour higher in overweight children in (1). Global self worth higher in obese children in (1). No difference in BMI, other psychological measures or dieting behaviour between groups. Focus groups indicated higher levels of self-reported behaviour change, understanding, & knowledge in (1).		
(235); (236,237)	To identify determinants of long-term success in weight maintenance in obese subjects. (Success rate of long-term maintenance of weight loss in obese patients is	RCT	Adults (18-65) with BMI>30 who had completed a 6-month weight-loss phase; European 8-centre study, UK sites in Luton, London & Aberdeen.	The Sibutramine Trial on Obesity Reduction and Maintenance (STORM). (1) 18 months sibutramine treatment with dietary restriction & advice on exercise & behaviour (n=352); (2)	Secondary HP (not main focus: effect of continued use of Sibutramine on weight loss); behavioural interventions (approach not explicit); healthy eating	Weight-maintenance success after weight loss is positively influenced by (1) during weight maintenance, by a greater initial weight loss, & by a higher leisure-time	N/A	Dietitians involved (role unclear) Fundamentally a drug trial (partly funded by BASF Pharma, manufacturers of Sibutramine)

	usually low. Determinants of long-term weight maintenance need to be identified)			placebo (n=115).		physical activity index, which reflects higher levels of activities such as walking & cycling, & lower levels of television viewing.		
(238)	To evaluate the impact of healthy eating & exercise session in a small cohort of obese women with learning disabilities. (People with learning disability need more help with diets and advice on getting enough exercise, particularly those who are overweight)	Before and after study	Obese women with learning difficulties from low-income groups; community sites (including supermarkets, health centres)	Healthy eating sessions (n=9) included a balanced diet and why it is important to health; ideas on how to achieve a balanced diet, supermarket tours to discuss food items bought. Also exercise sessions.	Secondary HP (main focus); health education (approach explicit); healthy eating, physical activity.	By the end of the course breakfast was being taken regularly by 8/9; fruit or fruit juices were taken during the day by all; veg or salad consumption increased; a meal/snack was often taken at lunch; crisps, sweets & biscuits were no longer regular snack items. All changes confirmed by carers who reported a difference in foods bought when shopping. Weight records showed overall weight loss and reduction in BMI. Waist measurements also fell.	N/A	Dietitian-led.

Table 18. Dietetics – dialysis patients: included studies

Main ref; other refs.	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(239)	To determine the effect of a dietetic educational intervention on phosphate and calcium levels of hemodialysis patients. (Role of dietitians in managing hyperphosphatemia in dialysis patients)	RCT	Stable adult hemodialysis patients with hyperphosphatemia; NHS teaching hospital hemodialysis unit, London (urban)	(1) Educational intervention and 1-to-1 teaching session, attempting to improve knowledge of phosphate management & compliance with diet & medication (n=29); (2) no intervention (n=29).	Secondary HP (main focus); health education (approach not explicit); healthy eating, other (compliance with treatment & medication)	Measures: serum phosphate, calcium & calcium x phosphate products. Serum phosphate significantly reduced after (1) (no significant change in controls). Results sustained over at 3 months. Dietetic educational intervention can favourably alter patients' serum phosphate levels, with potential impact on morbidity & mortality.	Moderate	Led by renal dietitians. Researcher blinding status unclear. Hawthorne effect skewed the results.
(240); (241)	Pilot study to assess programme of verbal & written fluid balance advice. (Individuals undergoing chronic haemodialysis are asked to adhere to a restricted fluid intake. Failure to do so can contribute to severe medical problems and increase the risk of	Time series study (quantitative)	Patients with end stage renal disease requiring haemodialysis; NHS hospital out-patient haemodialysis unit, North West England	Patients (n=21) followed over 3 6-week periods: 1) recorded interdialytic weight gains using existing compliance advice; 2) involved dietitian & ward staff meeting patients to reinforce health promotion	Tertiary HP (main focus); health education (approach explicit) ; self-management	Measure: interdialytic weight gain. 48% demonstrated overall improvement in mean weight gain; however, this was not statistically significant. Further studies with greater numbers & a control group would have a useful contribution to make in this field.	Weak	Dietitian-led; also involved nurses.

	premature death)			& fluid concordance; 3) followed the introduction of a health promotion leaflet.				
(242)	To examine the influence of monthly dietetic consultations on patients' serum phosphate concentrations. (Need to improve dietary compliance among renal dialysis patients in order to reduce phosphate concentrations)	RCT	Stable adult haemodialysis patients with hyperphosphataemia; NHS hospital haemodialysis unit, London	(1) monthly dietetic consultations for 6 months aimed at limiting dietary phosphate intake & improving compliance with phosphate binders (n=34): included motivational counselling, negotiation, behaviour modification, reminders & reinforcement; (2) standard care with dietetic consultations every 6 months (n=33).	Tertiary HP (main focus); behavioural interventions (approach explicit); ADL, self-management; healthy eating	Measures: serum phosphate concentration, calcium x phosphate product (primary), various nutritional parameters, e.g. BMI. Serum phosphate decreased in group (1) from 2.05 to 1.80 mmol/l by month 3. However, this subsequently increased & by month 6 no significant difference from baseline. (1) did not significantly affect any other nutritional parameters. More innovative strategies may be needed to control hyperphosphataemia in the longer term.	Moderate	Delivered by 1 renal dietitian with advanced counselling skills.
(243); (244)	To analyse effect of a structured education program on knowledge of phosphate & phosphate binders and serum	Before and after study (quantitative)	Hemodialysis patients acting as own controls; 2 non-NHS units, Bradford (urban)	Small group (6-8) teaching sessions with the aid of a hospital interpreter as required (n=115, 54% male, mean	Tertiary HP (main focus); health education (approach not explicit); self-management, healthy eating	Measures: knowledge of phosphate & phosphate-binder therapy (questionnaire), serum phosphate, calcium, dialysis	Weak	Dietitian-led; renal specialists also involved. Assumes that improvement

	phosphate levels among haemodialysis patients			age 61.1, 32% Asian). Patients also received information booklets or audio cassettes translated into Urdu.		clearance, serum parathyroid hormone. After 1 month, statistically significant improvements by 2 marks (out of 14) in general knowledge about phosphates & phosphate binders. No change in serum phosphate levels, except among a subgroup with previously raised levels.		in knowledge will lead to improvement in clinical outcome. No measure of behaviour change.
(245)	To measure effect of dietary advice on energy intake among patients on Continuous Ambulatory Peritoneal Dialysis (CAPD)	RCT	Adults on CAPD for kidney failure; NHS hospital renal unit, Portsmouth (urban)	Mean age 59, 55% male. Control (n=27) & intervention (n=28) groups both received slightly differing 'dietary advice'. No information on the form this took, its content or frequency.	Tertiary HP (main focus); health education (approach not explicit); healthy eating	Measures: energy & protein intake (food diaries), energy expenditure (exercise questionnaire), blood tests. No change/difference in dietary intake or nutritional status. Need for more sensitive means of estimating energy expenditure and more effective dietary advice.	Weak	Dietitian-led
(195)	To examine the role of changes in dialysis prescription, individualized dietary input & exercise on body weight & composition.	Prospective cohort study (described as "prospective interventional study")	Patients on PD >3 months with BMI >25 & deemed medically fit to undergo an exercise programme; NHS hospital, Cambridge (urban)	1-year intervention to support, educate & encourage patients in a weight-reduction program (n=12). Meetings included	Tertiary HP (main focus); behavioural interventions (approach explicit); healthy eating, physical activity	Significant fall in median body weight at 6 & 12 months. No significant changes in total body water, lean body mass, or % body fat. Use of an informal group	N/A	Dietitian-led; intervention integrated the care of renal nurse, renal dietitian & PT.

	(Patients on peritoneal dialysis (PD) exposed to glucose-based dialysate solutions with risk of obesity & health problems)			diet, exercise, assessment & advice.		setting motivated patients to continue with exercise & sensible eating patterns. This study demonstrates that, with adequate support, PD patients can achieve & maintain weight loss.		
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Table 19. Dietetics - pulmonary rehabilitation: included studies

Main ref; other refs.	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(246)	To investigate whether patients receiving additional dietetic intervention during pulmonary rehab significantly increased their nutritional knowledge, facilitating improvements in nutritional status. (Pulmonary rehab can improve functional status & QoL of chronic obstructive pulmonary disease (COPD) patients but no research examining group dietetic intervention during standard rehab courses)	CCT (non-randomised)	Patients with COPD receiving an 8-week pulmonary rehabilitation programme; South East England.	(1) nutrition education session covering healthy eating during periods of stability + advice on coping with loss of appetite & reduced intake during illness and exacerbations (n=6); (2) (1) + follow up during weeks 4, 6 & 7 when additional dietary advice was provided, addressing issues raised by individual patients (n=5).	Tertiary HP (not main focus: effect of additional dietary advice, remaining content of the programme unclear); health education (approach not explicit); self-management, healthy eating	Measures: anthropometry (e.g. BMI), food diaries, nutritional knowledge (questionnaire). Results did not show statistical significance & the association between nutritional knowledge & improved nutritional outcomes remains unclear. However, the findings may have clinical significance since they appear to show that additional dietetic intervention may benefit the nutritional status of these patients. Small sample sizes limit conclusions which can be drawn. Further research needed using larger sample & longer intervention & follow-up in order to make recommendations for dietetic best practice.	N/A	Dietitian-led.
(174)	To evaluate the effects of an early community-based pulmonary rehab programme for acute	RCT	Patients admitted with an acute exacerbation of COPD; London	(1) 8-week pulmonary rehab programme started <10 days of hospital discharge (n=21); patients also	Tertiary HP (not main focus: pulmonary rehab); health education (approach not	Significant improvements at 3 months for (1) in median incremental shuttle walk distance,	N/A	Run by MDT: respiratory PTs, nurses, OT, dietitian, respiratory

	exacerbations of chronic obstructive pulmonary disease (COPD). (Hospital admissions growing burden on NHS. Rehab leads to significant improvements in health related QoL, etc.)		(inner-city)	received individualised home exercise programmes encouraging 20+ mins exercise/day; (2) usual care (n=21).	explicit); ADL, physical activity.	mean St George's Hospital Respiratory Questionnaire total score, all domains of Chronic Respiratory Questionnaire (dyspnoea, fatigue, emotion, mastery) & the mental component of SF-36. Larger randomised studies required to determine long-term effects, cost-effectiveness, etc.		doctor, smoking cessation adviser, social worker, pharmacist & lay member of a patients' group supervised education activities on a rolling rota.
(175)	To promote rehabilitation of patients with severe chronic obstructive pulmonary disease (COPD), using a combined programme of supervised exercise, advice & goal setting. (Education alone less effective than comprehensive rehabilitation. Effectiveness of rehab has not been examined in severe COPD)	RCT	Adults with severe COPD; NHS hospital, Bristol	Mean age 67, 80% male. (1) 12 x 2-hour group sessions over 6 weeks of supervised exercise + education from MDT + 'intermittent' goal setting (n=54); (2) single 1-hour advice session & advice pack (n=49).	Tertiary HP (not main focus: supervised group exercise accounted for half of each session); behavioural interventions (approach explicit); self-management, physical activity, self-esteem/efficacy	Shuttle walking distance increased significantly in (1) by 43m. The increase of 23m in (2) was significantly less than in (1). Improvements in QoL in (1) were small & not clinically significant. Recruitment problems meant the study was underpowered.	N/A	Led by respiratory physician; advice given by PT and respiratory nurse; dietitian gave advice on diet.

Table 20. Dietetics – heart disease: included studies

Main ref; other refs.	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(247)	To determine if lifestyle counselling sessions are of interest to patients at risk of coronary heart disease (CHD) & if these result in changes in physical activity, diet & health status. (Targeting both diet & energy expenditure considered most effective for obesity but the most effective way to facilitate changes in health behaviour is less clear.)	RCT	Adults (18-65), mostly obese, at risk of CHD; primary care, South Central England (urban)	(1) standard exercise & nutrition information + training over 6 months focused on delivering a 1-to-1 lifestyle counselling intervention that incorporated strategies from psychotherapy & behaviour change theory (n=203) (professionals trained to use an adapted motivational interviewing counselling style); (2) usual care (standard information only) (n=131).	Secondary HP (main focus); behavioural interventions (approach explicit); healthy eating, physical activity, self-esteem/efficacy; smoking cessation	Measures: blood pressure, cholesterol, weight, height, International Physical Activity Questionnaire, fat intake, Five-a-day Community Evaluation Tool questionnaire (whether patients consuming 5 portions of fruit & veg a day). At 6 months, group (1) were more active, particularly walking, & had reduced weight, blood pressure & cholesterol, but had not changed their diet, compared with (2). Those who did more sessions had greater increases in activity & reductions in weight, blood pressure & cholesterol. Attending sessions was of interest to patients & generally reduced CHD risk factors.	Moderate	Independent researcher-led; sessions delivered by "physical activity specialist" & dietitian
(176); (177-179)	To assess whether a family-based, cardiology programme could increase the	Matched, paired cluster RCT	Adults with CHD or at high risk of developing CVD; European multi-	(1) 'EUROACTION', a family-based, ambulatory, preventive cardiology programme	Secondary & tertiary HP (main focus); behavioural interventions	Measures: family-based lifestyle change, management of blood pressure, lipids, blood	Moderate	Nurse-led MDT (2 cardiac specialist nurses,

	proportions of patients & their families achieving the goals for cardiovascular disease (CVD) prevention. (CVD prevention in routine clinical practice is inadequate. Most patients are not referred to a cardiac rehabilitation programme and < a third attend)		centre study, UK sites NHS hospitals, London & East of England	with a whole family orientation (n=1589): group workshop & supervised exercise class for patients & partners, Family Support pack of information & advice on smoking, diet & exercise; (2) "usual care" (n=1499).	(approach explicit: stages of change model); ADL, healthy eating, physical activity, self-esteem/efficacy, smoking cessation	glucose, prescription of cardioprotective drugs (primary). Among patients with CHD who reported smoking in the month before their cardiac event, a higher proportion in (1) were not smokers at 1 yr compared with (2); a higher proportion of patients with CHD in (1) attained the dietary targets for saturated fat intake, fruit & veg, & oily fish at 1 yr than (2); proportion of patients with CHD achieving target for self-reported physical activity at 1 yr was significantly higher in (1) than (2); other measures (e.g. cholesterol, BMI) showed no significant change. Trial carried out in non-specialist centres using readily available equipment, therefore easy to roll out.		dietitian, PT)
(181)	To describe patients' experiences of a pre-operative programme of cardiac rehabilitation developed for those awaiting coronary	Before and after study	Patients with coronary heart disease (CHD) awaiting CABS; NHS hospital, Belfast (urban)	Pre-operative programme of cardiac rehab (n=8): prescription of weekly exercise; motivational interviewing to increase compliance, achieve	Tertiary HP (not main focus: cardiac rehabilitation); behavioural interventions (approach explicit); self-management,	Participants found a useful means of improving exercise capacity & decreasing anxiety, and their initial fear that exercise would cause a	N/A	Involved dietitians, PTs, clinical psychologists, nurses.

	artery bypass surgery (CABS). (Limited evidence regarding patients' experience & perceptions of such intervention)			behaviour change & modify risk factors; management of misconceptions; education on nature & causes of CHD & CABS; preparation for surgery including discussion with patient who has successfully recovered; treatment of psychological disturbances.	healthy eating, physical activity.	heart attack was replaced with confidence, enabling them to become fitter and modify other risk factors. Further research needed to evaluate the efficacy of pre-operative rehabilitation on risk factor modification.		
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Table 21. Dietetics – other target groups: included studies

Main ref; other refs.	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(248)	To measure the effect of a training & education package on health professionals' and community workers' knowledge of diet for preconception and pregnancy. (Importance of diet before & during pregnancy & concern about nutrition knowledge among professionals)	Before and after study (quantitative)	Health professionals & community workers involved in the care of women at the time of conception & 1st trimester; various settings (e.g. family planning & family centres, GP practices), North Tyneside.	Training & education package delivered to various health professionals & community workers: 1 day covering healthy eating, food safety and current research issues; or a condensed session covering key points PLUS an update for those who completed the above.	Primary HP (main focus); health education (approach not explicit); healthy eating	Measure: "nutrition knowledge questionnaire". Knowledge improved in all groups of professions with a mean increase in knowledge of 29%. Results suggest that the training was most useful for those groups of workers with little or no medical background, showing a mean increase in knowledge of 42%.	Weak	Package compiled and delivered by a state registered dietitian.
(249)	To compare the effect of two types of dietary advice given by community dietitians on subsequent dietary intake in Scottish men.	CCT (non-randomised) ("parallel design intervention study")	Scottish men aged 40+ with elevated blood cholesterol levels already referred to community services for dietary advice; community site, Scotland .	(1) advice (over 8 weeks) to reduce foods high in fat & substitute with foods high in carbohydrate (n=15); (2) advice (over 8 weeks) typically given to subjects with elevated blood cholesterol, including advice to reduce both fat & sugar (n=15).	Secondary HP (main focus); health education (approach not explicit); healthy eating.	Measures: intake of dietary fat & sugar, blood cholesterol. Neither group significantly reduced fat intake, yet both self-rated intake as being lower than at the start. Group (2) reduced % energy from sugar & increased % energy from starch without significantly changing % energy from total carbohydrate. No	Weak	Community dietitian-led

						significant change in blood cholesterol. Advice to reduce dietary fat was not effective in this group. Also high refusal rates. Need to prioritise dietary messages.		
(250)	To assess the Boost Better Breaks (BBB) school-based partnership to promote and facilitate healthier eating. (WHO goal in which 80% of 6-year-olds should have caries free teeth by 2020. Northern Ireland has highest rate in UK, reflecting heavy consumption of cariogenic snack foods)	CCT (non-randomised)	Primary & pre-school age children; 16 primary schools & pre-school groups within Southern Health & Social Services Board (NI) are involved in the program (rural)	(1) BBB programme, aiming to reduce inequalities in oral health among this group (8 schools, n=189): consumption of only milk & fruit at break time; (2) 8 control schools (n=175).	Primary & secondary HP (main focus); behavioural interventions, community development (approach explicit); healthy eating	Measure: childhood dental disease. Results of first 2 years indicate that the program had a positive effect in increasing mean number of sound teeth in children attending schools in areas in which socioeconomic conditions are poor. Suggests that collaboration can facilitate improvement in children's dental health & that careful targeting of the policy to schools in poor areas has the potential to narrow disparities.	Weak	Led by dietitians; supported by health promotion officers, teachers, school meal advisors & local suppliers of school milk.
(185)	To provide stroke survivors with aphasia, their carers and families with information, support and advice. (Stroke	Qualitative study	Adult stroke survivors with aphasia and their carers; NHS Hospital stroke rehab unit	7 education and advice sessions given by various members of the stroke recovery team (frequency and duration of sessions	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL,	76% found the information useful, relevant and easy to understand. Lack of language support (interpreters and	Weak	Nurse-led. MDT also included PT, OT, dietitian, SLT, pharmacist, social workers

	is the commonest cause of adult disability in the UK. Information provision for patients and carers is lacking and current information may be difficult for patients with impairments such as aphasia to understand)		London (inner-city)	not specified)	self-management, health eating, physical activity, self-esteem/efficacy, sexual behaviour	materials) for Bengali-speaking clients identified as a barrier.		There can be little reliance on this study. It is a small scale local evaluation of a local initiative. Virtually no information on the design or execution of the evaluation.
(183)	To develop & evaluate a pilot multi-disciplinary education & support group programme for patients with fatigue post cancer treatment. (Fatigue causes major distress post treatment but little evidence about the effectiveness of interventions)	Before-and-after study (feasibility study)	Women with breast cancer; NHS Hospital, Central London (urban)	3 workshops (n=6) delivering large group support & small group discussion. Support anticipated to encourage awareness of emotional, cognitive & motivational aspects of fatigue, and increase confidence in its management. Diet, exercise, sleep hygiene, relaxation, anxiety & lifestyle management addressed in smaller group discussions.	Tertiary HP (main focus); behavioural (approach not explicit); self-management, healthy eating, physical activity, self-esteem/efficacy, other (sleep hygiene)	Main measures: Brief Fatigue Inventory, Hospital Anxiety & Depression Scale, European Organisation for Research & Treatment of Cancer QLQ C30, programme evaluation by telephone. Whilst not reducing the level of fatigue there was some evidence that impact on function was lessened. Cancer QoL showed improvements on some sub-scales. Sharing with others, help & advice from experts were valued most. Numbers small but findings warrant continuing service	Weak	Intervention delivered by MDT (Fatigue Management) including a dietitian, OT PT, psychologist & nurse. Very small pilot study. Evidence of effectiveness is absent. Suggestive only.

						development & evaluation. Need for individual follow up, possibly by telephone.		
(251); (252,253)	To improve nutritional status, knowledge & self-efficacy of people with cystic fibrosis (CF). (Increasing numbers of young people with CF surviving to adulthood raise the need to provide healthy eating advice)	RCT	Adults with CF; home settings, East of England.	(1) "Eat Well with CF", 10-week home-based behavioural nutrition intervention (n=34): gender-specific issues e.g. body image, goal setting (participants telephoned weekly) & 2 workshops on motivation & recognizing achievements; (2) standard care (n=34).	Tertiary HP (main focus); behavioural interventions (approach explicit: Social Cognitive Theory); ADL, self-management, healthy eating, self-esteem/efficacy.	Measures: weight gain (primary), CF & general nutrition knowledge (validated questionnaires), self-efficacy, dietary fat intake, health-Related QoL (validated questionnaire). Substantial improvements for (1) in specific CF nutrition knowledge score, self-efficacy score & reported fat intake compared to (2), but no substantial change in BMI or health-related QoL over time. Study revealed gaps in basic nutrition knowledge & skills, inadequate knowledge of diet-disease links & pancreatic enzyme replacement therapy, which need to be identified when subjects progress from paediatric to adult care. This type	Weak	Dietitian-led.

						of programme is a useful adjunct for dietitians trying to manage this population & become facilitators of behavioural change.		
(254)	To assess the impact of a multidisciplinary paediatric allergy clinic consultation on parental knowledge of food allergy & determine the rate of subsequent allergic reactions. (Large deficiencies in knowledge of how to avoid allergen exposure and manage allergic reactions)	Before and after study	Children <17 years with food allergy & their families; NHS hospital paediatric allergy clinic, London (urban)	Single session of advice regarding food allergen avoidance (n=62). The problems of cross-contamination and cross-reactivity within food groups and indirect exposure were highlighted. Education was reinforced with written material.	Secondary (not main focus: dissemination of knowledge of food allergy to reduce allergic reactions); health education (approach not explicit); self-management, parenting behaviour	Significant improvement in parental knowledge of allergen avoidance, managing allergic reactions and EpiPen usage. Significant reduction in allergic reactions. Children with egg, milk or multiple food allergies were more likely to suffer subsequent reactions.	N/A	Advice given by specialist paediatric dietician. MDT also included paediatric allergist & nurse specialist.
(255)	To develop a personalized snack-based intervention for practical implementation in hip fracture patients & to assess feasibility, adherence, acceptability & cost. (Under-nutrition common in older people admitted to hospital with hip fracture)	Before and after study	Older hip fracture patients; NHS hospital	Provision of 3 between-meal snacks daily for 4 weeks following surgery (n=23, mean age 84.1). Dietary counselling, assessment of acceptability & feasibility were undertaken & intervention costs calculated.	Tertiary HP (not main focus); behavioural interventions (approach explicit); healthy eating	Mean estimated energy derived from the snacks provided 26% of daily energy requirements. Monitoring adherence proved problematic. Although several participants reported that they did not usually eat between meals, overall the intervention was acceptable. A more appropriate time to deliver intervention	N/A	Delivered by a dietitian

						may be after the acute phase & patients are back home. Costs compared favourably with the alternative of providing sip feeds.		
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6 Occupational therapists

6.1 Profile of the profession

Occupational therapy (OT) assists people of all ages to achieve health and life satisfaction through improving their ability to carry out the activities that they need or choose to do in their daily lives (256). It focuses on the nature, balance, pattern and context of occupations and activities in the lives of individuals, family groups and communities and is concerned with the meaning and purpose that people place on occupations and activities and with the impact of illness, disability or social or economic deprivation on their ability to carry them out (257). OT is seen as a partnership between client and therapist in which both participate actively, thus increasing clients' responsibility, choice, autonomy and control in the areas of care and self care, productivity and leisure, that will support recovery, health, wellbeing and social participation.

OTs work with people of all ages, with physical, mental and social impairments and learning disabilities, and include those with multiple and complex problems, those with minor coping difficulties and those who are functioning well and wish to maintain their wellbeing (257). They work within a wide variety of settings, including primary and secondary care, community centres, schools, commercial organisations, prisons, residential and nursing homes, and clients' homes. Practice areas of particular importance include mental health and addictions, rehabilitation for neurological disorders (such as brain/spinal injuries and stroke), rheumatoid arthritis, learning disabilities and vocational rehabilitation. Advising on environmental adaptations and equipment for daily living is a crucial part of their role. Examples of their activities include ensuring that homes, workplaces and public places are accessible for people with specific needs; advising in schools to help children overcome writing or learning difficulties; leading return-to-work programmes for people with anxiety, depression or back problems; and assisting ageing couples to care for one another and remain independent in their own homes (258).

OT is the second largest allied health profession, after physiotherapy. There are just over 30,100 HPC-registered OTs in the UK (49), around 14,500 of whom are employed within the English NHS (43). The professional body is the British Association of Occupational Therapists.

6.2 Results from the systematic review

Twenty-eight studies met the criteria for inclusion in the review and have been divided into seven groups (see Table 16 to Table 28): mental health (9

studies), arthritis (6), pain and fatigue (5), pulmonary rehabilitation (2), stroke (2), drug and alcohol problems (2) and falls prevention (2).

These interventions span the full range of physical, mental and social impairments and learning disabilities that OTs deal with and illustrate well the multiple and complex nature of the conditions they encounter. They are also representative of the range of subjects they work with, from adolescents through to older people, and including informal carers. The interventions also illustrate well the wide variety of settings in which OTs practise. These included acute trusts, residential and domestic home settings, and a rural 'Outward Bound' style camp. Interventions were equally varied, including a one-off brief education initiative to reduce anxiety among patients about to undergo hip replacement surgery, the Outward Bound camp already mentioned for adolescents with Juvenile Idiopathic Arthritis, and a variety of life skills programmes for people with severe mental health conditions. The vast majority of interventions also involved multidisciplinary team working, with the composition of the team varying according to the particular clinical focus. Thus, the mental health interventions generally involved psychologists and other mental health specialists (and also included a rare instance of social worker involvement), while partnerships with physiotherapists predominated in the other conditions. It is noticeable that for community-set interventions (such as for mental health and alcoholism and drug problems) OTs were unambiguously the lead profession. In hospital settings, by contrast, their role was much less dominant, with far fewer interventions being led by them.

In terms of study quality, only 17 of the 28 studies were subjected to full quality assessment. This was because the health promotion intervention was their main focus. No study was rated 'Strong', just one was rated 'Moderate', with the remainder rated as 'Weak'. The reasons for this were varied and reflected the well-rehearsed difficulties of researching health promotion. Most studies where health promotion was the main focus were of less powerful types, such as Before and after (frustratingly, the more powerful designs rarely focused on health promotion). Even then, they tended to suffer from a series of weaknesses of detailed design and/or execution. These included: small numbers; absence of controls; reliance on reported (rather than observed or measured) benefits; lack of blinding (either of subjects or assessors). Given that few interventions were independently evaluated (by and large, the evaluators were also the service providers), observer and respondent bias have to be regarded as strong possibilities. Reporting of such studies was also an issue. It was often incomplete, with inadequate descriptions either of the intervention itself or (equally importantly) of the setting. It is impossible to know whether this criticism should be levelled at the researchers themselves or of the journals they submitted to.

Table 22. Occupational therapy – mental health: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(259)	For adults with enduring mental health needs: 1) to evaluate impact of a Community Living Skills (CLS) group on functioning; 2) to ascertain need for CLS groups; 3) to pilot evaluation. (CLS groups used widely but have not been properly evaluated)	Before and after study (quantitative)	Working age adults with "enduring mental health need" e.g. schizophrenia, depression, bipolar, head injury; community site (community mental health team), Ayrshire and Arran, Scotland	12 weekly CLS small group sessions (n=5, age range 32-49). No detail supplied on duration, content etc.	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, social skills.	Measures: Canadian Occupational Performance Measure, client satisfaction questionnaire. Performance & satisfaction improved slightly; high levels of client satisfaction; post-group home visits demonstrated improvement in majority of group members in effective task management within the home.	Weak	OT-led
(260)	To empower women with borderline personality disorder and enable them to live more independently in the community by developing new knowledge and skills	Before and after study (qualitative)	"Difficult to engage" women with borderline personality disorder; small residential rehab centre for women with complex mental health needs, South East England	Community Living Skills (CLS) group sessions (10 weeks) covering e.g. assertiveness; self-esteem; shopping and cooking; meeting new people; structuring time; self-management (n=5).	Tertiary HP (main focus); behavioural interventions (approach explicit: "Human Givens"); ADL, social skills, self-esteem/efficacy	Measures: satisfaction, Likert-type responses to 2 questions (Did you achieve your personal aims? How able do you feel you can apply the information to your daily life?). Observed positive behavioural changes; improved self-reported confidence; highly positive feedback from participants and staff.	Weak	OT-led; also involved a psychology assistant
(261)	To investigate whether OTs can	Qualitative study	Women with acute mental	Psychoeducation group for women to	Secondary HP (main focus);	Measures (not clearly described):	Weak	OT-led, a nurse & psychologist also

	contribute to psychoeducation on a women's ward of an acute mental health unit. (Concerns about lack of female-specific treatment)		health conditions; women's ward, NHS Acute Mental Health facility, London (urban)	discuss topics of interest to them (n=12). Content aimed at empowering participants to improve their lives/health.	health education (approach explicit); behavioural focus not specified.	attendance, comments by participants, assessment of MDT working. OTs, with their knowledge of group processes and activity, are well placed to deliver psychoeducational interventions in acute mental health setting.		involved in development & delivery.
(262)	To evaluate a client-centred approach to leisure enhancement for adults with severe mental health problems. (The social & occupational consequences of mental illness have considerable impact on QoL.)	Before-and after-study (qualitative: telephone survey post intervention)	Unemployed adults with severe mental health problems; community site (CMHT), London (urban)	The 'Active Advice' project (n=17, 11 male), a systematic client-centred approach to leisure enhancement for this group: involves identifying latent interests, facilitating leisure participation & helping to bring together isolated individuals through a shared interest.	Secondary & tertiary HP (main focus); behavioural interventions (approach explicit: leisure enhancement; ADL/skills, self-esteem/efficacy, other (leisure)).	Measures: lifestyle interview (based on Occupational Case Analysis Interview & Rating Scale), identification of leisure interests (Interest checklist), phone interview at 6 months. 47% completed leisure action plans & reported motivational gains; 53% failed to complete & reported as barriers: lack of timely follow-up, lack of confidence or motivation & lack of companion. Subsequent programmes should devise strategies to maintain initial enthusiasm and motivation.	Weak	OT-led. Also involved a support worker. Poorly designed & executed evaluation, relying exclusively on reported benefits. Tools & checklists used to construct leisure plans but not repeated at follow-up. No baseline data & absence of clinical outcome data mean effectiveness cannot be gauged.
(263); (264)	To reduce anxiety by means of an OT-led lifestyle	RCT	Adults with panic disorder; primary care (15	Mean age 40.1; 68% female. (1) lifestyle treatment (n=31)	Secondary HP (main focus); behavioural	Measures: Beck Anxiety Inventory (BAI) (primary), panic	Weak	OT-led.

	treatment. (Large increases in treated anxiety. Lifestyle has potential role but not considered in clinical guidelines. Panic disorder potentially influenced by lifestyle factors.)		GP practices in 2 PCTs), East of England.	comprising: lifestyle review of fluid intake, diet pattern, exercise, caffeine, alcohol & nicotine; negotiation of positive lifestyle changes; monitoring & review of impact of changes; (2) routine GP care (n=36).	interventions; various lifestyle-related behaviours.	attack data (ADIS-IV), Beck Depression inventory II, Fear Questionnaire, QoL (SF-36 & EQ-5D). Significantly lower BAI scores for (1) at 20 weeks, non-significant at 10 months. 63.6% (1) & 40% (2) patients panic-free at 20 weeks; 67.7% & 48.5% respectively at 10 months. A lifestyle approach may be at least as clinically effective as (2). Further study required before suggesting practice changes. Study size/power calls for caution in interpreting findings.		
(265)	To assess the impact of a life skills training (LST) programme for individuals with a diagnosis of schizophrenia. (Rehab approaches incorporating LST are widely employed in treatment of people with schizophrenia but not known whether such approaches	Before-and-after study (quantitative)	Adults with schizophrenia; home settings, Greater Manchester (urban)	Therapist devised individualised intervention then LST programme, 1-to-1 over 4 months (n=17, mean age 39, 13 male): promoting life skills acquisition, e.g. leisure facilities, household management, employment, communication. Included psychoeducation, activity scheduling,	Tertiary HP (not main focus: reducing symptom severity, improving social functioning); behavioural interventions (approach explicit: social learning theory); ADL, self-management.	Measures: symptom severity (Positive & Negative Syndrome Scale (PANSS) for schizophrenia, Social Functioning Scale, covering 7 areas of social functioning. No change in social functioning; symptoms reduced significantly. This uncontrolled study does not allow definitive evaluation of LST in schizophrenia,	Weak	Led by 8 OTs with training in life skills therapy; also involved psychologists. Small numbers, lack of control group, absence of standardisation of intervention, unblinded assessment.

	effective)			modelling, shaping & reinforcement.		but does provide justification for a larger-scale controlled trial of a manual-based approach to LST with this group.		
(266); (267-271)	To gain understanding of how pre-operative education is beneficial in reducing anxiety for patients awaiting total hip replacement. (Pre-operative education widely used by OTs to reduce anxiety & promote rehabilitation)	Before-and-after study (qualitative)	Patients awaiting total hip replacement surgery & their carers; NHS hospital, East of England?	A 2-hour education programme (n=12) offering a chronological account of hip surgery from admission to full recovery. Emphasis on information giving. (Although empowerment is discussed in a related study as an intended outcome, the programme content does not explicitly address this.)	Secondary HP (not main focus: to promote recovery and rehabilitation); health education only (approach not explicit); ADL, self-management, physical activity, self-esteem/efficacy.	Measures: provider perceptions of patient outcomes & intervention effectiveness, patient feedback. Patient education can reduce anxiety through providing an understanding of the patient experience, giving an opportunity to meet staff & familiarizing patients with environments they will meet in hospital. Major limitations were not being able to control for researcher bias & not providing a standardized instrument to collect data. Further research needed to understand dynamics between patient education & the reduction of anxiety among patients.	Weak	OT-led (assumed); education team described as 'multidisciplinary' (7 people, no details given). Mostly provider perceptions of outcomes & effectiveness. Patients reported to have evaluated the programme positively. No clinical outcome data although quicker rehabilitation & reduced length of stay claimed. Significant grounds for questioning reliability & validity of the research. Evidence in favour of intervention is extremely weak.
(272)	To determine if carer burden can be eased by raising	Before-and-after study	Carers of people with dementia; NHS hospital,	4-week structured course (n=7) including information	Secondary HP (main focus); behavioural	The carers who attended demonstrated a better	N/A	OT-led; also involved 2 community

	levels of awareness and by providing coping strategies to assist carers		West Dorset	and skills relating to relaxation, stress management. Length of sessions not stated.	interventions (approach explicit); self-management.	awareness & understanding of stress & its management; decrease in carers' rating in frequency of dementia-related problems, carer burden of dementia-related problems & overall carer burden. Structured stress management can reduce carer burden & offer better coping strategies through raising carers' awareness & understanding.		psychiatric nurses & a senior social worker
(273); (274)	To test the hypothesis that depression severity in care homes for older people would be reduced by an OT programme. (Evidence of high levels of inactivity in care homes and that inactivity leads to depression)	Cluster RCT	Older people; 8 care homes, York (urban) and county Durham (rural)	(1) The Care Home Activity Project (4 homes, n=78): over 12 months an OT worked with clients to explore & analyse their needs & wishes, sometimes in groups, & develop creative activities for complex occupational problems; diaries & residents records were kept; (2) no intervention (4 homes, n=65).	Secondary HP (not main focus: whether OT/activity can reduce depression); behavioural interventions (approach explicit); self-esteem/efficacy.	No significant intervention effects in any of the quantitative outcome measures (depression, dependency, QoL); qualitative interviews showed intervention was valued by many participants, staff & relatives. Lack of prior power calculations but data did not suggest effects that would have reached statistical significance with larger sample. Study highlights issues for consideration in providing such	N/A	4 OTs delivered the intervention. Costs study also carried out.

						services in care homes.		
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Table 23. Occupational therapy - arthritis: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(131)	To promote independence in ADL, self-advocacy & peer support among young people with juvenile arthritis. (Challenge for this group is engagement as active participants in their disease management & allowing them to make informed treatment decisions. Entails interventions that meet psychosocial needs & facilitate independence)	Before and after study (qualitative)	Adolescents with juvenile arthritis; participants recruited from Birmingham (NHS teaching hospital catchment), camp location unclear (rural)	'Independence Break', a 4-day 'Outward Bound' style self-catering residential intervention (n=30, median age 14, 17 female). Adventure activities, e.g. canoeing, climbing, abseiling and team-building challenges.	Tertiary HP (main focus); behavioural interventions, community development (fostering collective identity) (approach not explicit); ADL/skills, self-management, physical activity, self-esteem/efficacy; other (encourage social interaction)	Measure: author-devised open-ended questionnaire covering perceived benefits & skills gained, etc. 50% reported improved function; friendships (15/30); peer support (7/30); 17/30 reported still being in touch with another participant at 4 months; increased confidence (5/30). Need further research using a validated tool to measure psychosocial skills.	Moderate	PT- & OT-led. Delivery also involved care worker & nurse therapist. Lack of outcome/baseline data & validated tool make it hard to draw conclusions, though results suggest the camp helped form lasting relationships & create peer support. Prospective study of the scheme reported to be in preparation.
(138)	To develop a modular behavioural group programme for people with rheumatoid arthritis (RA) and inflammatory arthritis (IA) and evaluate its longer term effects on pain, physical and psychological	RCT	Adults with RA or IA; NHS hospital, West Midlands (urban)	Mean age 55.4, disease duration 7.39 yrs (53% <5 yrs). (1) 'Lifestyle Management for Arthritis Programme' over 6-9 months (n=86): self monitoring, talks from team members & discussions on knowledge & skill development; (2)	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, self-esteem/efficacy	At 6 months group (1) had better pain, fatigue, functional ability & self-efficacy scores, & greater use of health behaviours. At 12 months continued to have better pain, self-efficacy & psychological status scores & greater use of some health	N/A	Delivered by a PT & OT specialist in arthritis. Costs study also carried out.

	status. (Rheumatology guidelines recommend people with RA receive behavioural self-management education)			standard information-focused education programme (n=81). Both arms included exercise & other non-educational elements.		behaviours. A small team of rheumatology therapists can be trained in delivery in 2x2-day courses. Multi-centre trial by rheumatology therapists, longer term follow up and qualitative research needed.		
(132); (133)	To evaluate the long-term effects of joint protection on health status of people with early rheumatoid arthritis (RA). (Functional ability significantly reduced in people with RA. Behavioural approaches significantly more effective in increasing use of joint protection than 'standard' education)	RCT (4-year follow-up)	Adults with RA <5 years since diagnosis; 2 NHS rheumatology outpatient departments, West Midlands (urban)	1) a standard arthritis education programme (n=62) including joint protection based on typical OT practice, exercise, etc.; 2) a joint protection programme (n=65) incorporating educational, behavioural, motor learning and self-efficacy enhancing strategies to increase adherence.	Tertiary HP (main focus); behavioural interventions (approach explicit: health belief model and others); self-management; self-esteem/efficacy.	Measures: hand pain (VAS), adherence to joint protection (Joint Protection Behaviour Assessment 12) (primary), various indicators of disease activity, functional assessment/ADL (Arthritis Impact Measurement Scales 2), hand status, psychological status (Arthritis Self-efficacy pain & other symptoms subscales, Rheumatology Attitudes Index). At 4 years group (2) continued to have significantly better: joint protection adherence; early morning stiffness; ADL scores compared with (1).	Moderate	OTs & PTs led original intervention.

						Group (2) also had significantly fewer hand deformities. (2) should be more widely adopted. To be cost-effective, therapists should target it at people willing to make the changes required & able to attend all meetings.		
(275)	To evaluate whether OTs, following a 2-day educational-behavioural training course, could enable people with rheumatoid arthritis (RA) to improve use of joint protection & obtain similar results to previous trials of the programme. (Research suggests educational-behavioural approaches more effective than current practice)	CCT (single-blind crossover trial)	Adults with RA; 3 NHS district hospitals, West Midlands	An educational-behavioural joint protection programme ('Looking After Your Joints') (n=30): knowledge & skill development involving motor learning, mental rehearsal, problem solving & behavioural methods over 4 x 2-hour weekly sessions.	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management; self-esteem/efficacy	Median baseline Joint Protection Behaviour Assessment score was 15.39%, which rose significantly to 35% at 6 months. Participants & therapists expressed positive views of the programme. 16 participants increased use of joint protection by >20%. Training course facilitated therapists in delivering the programme effectively & they could gain similar behavioural improvements to previous trials.	N/A	Led by OTs with a specialism in rheumatology.
(276)	To evaluate a pragmatic, comprehensive OT programme on self	RCT	Adults with early RA (<2.5 years); 11 NHS hospitals across	(1) usual rheumatology care + group arthritis education programme	Tertiary HP (not main focus); behavioural interventions	Self-management significantly increased in group (1). Otherwise no	N/A	OT-led

	management & health status of people with early rheumatoid arthritis (RA). (OT aims at improving ADL, facilitating successful adjustments in lifestyle, and preventing losses of function)		the North Thames area (mixed urban/rural)	(8 hrs over 1 year) (n=162): information on RA & effects; emphasising self-managing symptoms through exercise, joint protection, & energy conservation; psychosocial effects of RA & coping strategies; (2) usual rheumatology care only (n=164). Both arms involved exercise.	(approach explicit); self-management, physical activity	significant differences in any outcome measure, or between groups, by functional class. Benefits of self management may not yet be apparent & longer follow up needed. Behavioural approaches can improve adherence &, potentially, long-term benefits.		
(277)	To evaluate patient adherence to self-care advice on joint protection. (Joint protection advice a routine part of OT intervention for people with rheumatoid arthritis (RA))	Retrospective cohort study (qualitative)	Adults with upper limb RA; NHS hospital, South Central SHA.	55% female. Routine OT practice: joint protection advice, provision of aids for ADL & splints (no further detail given). Reference to a RA support group but no details given.	Secondary & tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, self-management, physical activity.	Patient recall of advice, compliance with it & use of splints.	N/A	OT-led.

Table 24. Occupational therapy – pain and fatigue: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(143); (144)	To determine the effectiveness of an interdisciplinary CBT treatment for adolescents with chronic pain. (Children & adolescents frequently experience & report pain, though treatment is often judged unsatisfactory)	Before and after study (quantitative)	Adolescents with chronic pain & their parents; NHS hospital, Bath, South West England (urban)	3-week residential programme for child-parent dyads (n=57). Overall treatment contact time was 110 hours (60 hours physical & occupational activity; 35 hours CBT; 15 hours education).	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management, parenting behaviour, physical activity, self-esteem/efficacy.	Adolescents: significant improvements for self report of disability & physical function. At 3 months maintained physical improvements & reduced anxiety, disability & somatic awareness. Adults: significant improvement in report of adolescent disability, adult anxiety, depression, & parental stress. At 3 months significant improvements maintained, 64% improved school attendance, 40% back to full-time education.	Weak	PT-led; also involved hospital doctors, nurses & psychologists.
(147)	To promote positive coping strategies, behaviours and attitudes and prevent the long-term negative behaviours associated with chronic pain at an earlier stage. (Need for	Before and after study	Adults with chronic pain; NHS hospital, Outer London (suburban)	'Pain Coping Strategies programme' (n=31, mean age 45, 57% female). Mostly small group exercise, plus individual brief teaching sessions including goal setting,	Tertiary HP (not main focus); behavioural interventions (approach explicit: CBT); ADL, self-management; healthy eating,	Programme reduced anxiety & depression & improved physical performance. However, coping strategies & beliefs about pain were not	N/A	Unclear who led intervention. Groups co-ordinated by a PT, OT, clinical psychologist & clinical nurse specialist.

	early intervention in chronic pain)			relaxation, pain education, ADL, medication, healthy eating, etc.	physical activity, self-esteem/efficacy.	measured. The outcomes from this pilot can be utilised as a guide for further research using a control group.		
(146).	To determine the effectiveness of a 6-week combined pool-based exercise and education programme plus usual medical care for fibromyalgia syndrome (FMS). (FMS is a chronic muscular pain syndrome whose optimal management remains problematic)	RCT	Women (18-65) with FMS; Northern Ireland (setting not specified)	Mean age 49.6. Northern Ireland Fibromyalgia Therapy (NIFTY) Trial. (1) usual FMS medical care + lecturers & workshops to address attitudes, beliefs & behaviours regarding FMS + 6 weeks of pool-based aerobic exercises (n=42); (2) usual care only (n=44).	Tertiary HP (not main focus); behavioural interventions (approach not explicit); ADL, self-management, physical activity, self-esteem/efficacy	No significant difference between groups across these time points for any of the (numerous) outcome measures. The addition of a brief pool-based exercise & patient education to usual care does not offer superior benefit. High rates of attrition acknowledged as limiting definitive conclusions.	N/A	Unclear who led intervention; delivered by experienced OTs & PTs. Randomisation claimed but procedure not described.
(148)	To test the hypothesis that group CBT will produce an effective & cost-effective management strategy for patients with chronic fatigue syndrome/myalgic encephalopathy (CFS/ME). (CFS/ME causes substantial suffering, disability & financial loss. In the absence of a cure, attention turned to	RCT	Adults with a diagnosis of CFS/ME referred by their GP; NHS hospital health psychology department, Bristol (urban, mixed)	(1) group CBT (n=52) incorporating graded activity scheduling; (2) education & support (n=50); (3) standard medical care (n=51).	Secondary & tertiary HP (not main focus); behavioural interventions (approach explicit: CBT); self-management, physical activity, other (coping strategies, etc.)	Group (1) had significantly higher mental health scores, less fatigue & were able to walk faster than (3). (1) also walked faster and were less fatigued than (2). (1) did not achieve the expected change as a significant number did not achieve scores within the	N/A	Led by health psychologist. PT & OT involved. Costs study also included.

	management)					normal range. Treatment did not return a significant number of subjects to within the normal range on this domain; however, significant improvements evident in some areas. Further research needed on outcome measures, etc.		
(183)	To develop & evaluate a pilot multi-disciplinary education & support group programme for patients with fatigue post cancer treatment. (Fatigue causes major distress post treatment but little evidence about the effectiveness of interventions)	Before-and-after study (feasibility study)	Women with breast cancer; NHS Hospital, Central London (urban)	3 workshops (n=6) delivering large group support & small group discussion. Support anticipated to encourage awareness of emotional, cognitive & motivational aspects of fatigue, and increase confidence in its management. Diet, exercise, sleep hygiene, relaxation, anxiety & lifestyle management addressed in smaller group discussions.	Tertiary HP (main focus); behavioural (approach not explicit); self-management, healthy eating, physical activity, self-esteem/efficacy, other (sleep hygiene)	Main measures: Brief Fatigue Inventory, Hospital Anxiety & Depression Scale, European Organisation for Research & Treatment of Cancer QLQ C30, programme evaluation by telephone. Whilst not reducing the level of fatigue there was some evidence that impact on function was lessened. Cancer QoL showed improvements on some sub-scales. Sharing with others, help & advice from experts were valued	Weak	Intervention delivered by MDT (Fatigue Management) including a dietitian, OT PT, psychologist & nurse. Very small pilot study. Evidence of effectiveness is absent. Suggestive only.

						most. Numbers small but findings warrant continuing service development & evaluation. Need for individual follow up, possibly by telephone.		
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Table 25. Occupational therapy - pulmonary rehabilitation: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(173)	To determine whether clinical real-life rehabilitation for chronic obstructive pulmonary disease (COPD) is effective. (Research supporting the role of pulmonary rehabilitation in COPD, though less known about real-life clinical rehabilitation services)	Retrospective before and after study (quantitative)	Adults with (mostly) COPD & asthma; NHS hospital, South London (urban)	PT-supervised exercise & education, effective use of medications, benefits of exercise, chest clearance, etc. (n=91). 14 group sessions over 7 weeks (duration & ratio of exercise to education not stated)	Tertiary HP (not main focus); health education (approach not explicit); self-management, physical activity, other (relaxation and coping strategies)	76% completed assessment. 37% of patients achieved benefits for both St George's Hospital Respiratory Questionnaire (SGRQ) & Incremental Shuttle Walk Test. 28% were non-responders for both; 17% benefited for SGRQ only and 14% improved exercise tolerance. Randomized trials to evaluate different populations are warranted.	N/A	Education sessions provided by multidisciplinary team comprising OT, nurses, pharmacist, social worker and PT; PTs undertook the evaluation.
(174)	To evaluate the effects of an early community-based pulmonary rehab programme for acute	RCT	Patients admitted with an acute exacerbation of COPD; London	(1) 8-week pulmonary rehab programme started <10 days of hospital discharge (n=21); patients also	Tertiary HP (not main focus: pulmonary rehab); health education	Significant improvements at 3 months for (1) in median incremental shuttle walk distance,	N/A	Run by MDT: respiratory PTs, nurses, OT, dietitian, respiratory doctor, smoking cessation

	exacerbations of chronic obstructive pulmonary disease (COPD). (Hospital admissions growing burden on NHS. Rehab leads to significant improvements in health related QoL, etc.)		(inner-city)	received individualised home exercise programmes encouraging 20+ mins exercise/day; (2) usual care (n=21).	(approach not explicit); ADL, physical activity.	mean St George's Hospital Respiratory Questionnaire total score, all domains of Chronic Respiratory Questionnaire (dyspnoea, fatigue, emotion, mastery) & the mental component of SF-36. Larger randomised studies required to determine long-term effects, cost-effectiveness, etc.		adviser, social worker, pharmacist & lay member of a patients' group supervised education activities on a rolling rota.
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Table 26. Occupational therapy - stroke: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(185)	To provide stroke survivors with aphasia, their carers and families with information, support and advice. (Stroke is the commonest cause of adult disability in the UK. Information provision for patients and carers is lacking and current information may be difficult for patients with impairments such as aphasia to understand)	Qualitative study	Adult stroke survivors with aphasia and their carers; NHS Hospital stroke rehab unit London (inner-city)	7 education and advice sessions given by various members of the stroke recovery team (frequency and duration of sessions not specified)	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, self-management, health eating, physical activity, self-esteem/efficacy, sexual behaviour	76% found the information useful, relevant and easy to understand. Lack of language support (interpreters and materials) for Bengali-speaking clients identified as a barrier.	Weak	Nurse-led. MDT also included PT, OT, dietitian, SLT, pharmacist, social workers There can be little reliance on this study. It is a small scale local evaluation of a local initiative. Virtually no information on the design or execution of the evaluation.

(186)	To evaluate the effectiveness of an education programme for patients & carers recovering from stroke. (Provision of accurate information & advice is a recommended component of stroke services. Patients & carers dissatisfied with current information)	RCT	Patients admitted to stroke rehabilitation unit & carers; NHS hospital, Bradford, Yorkshire	≈60% male. (1) specifically designed Stroke Recovery Manual & fortnightly 1-to-1 education programme on rehabilitation goal setting, patient & carer information needs & increasing patient involvement in rehab process, in hospital and post discharge (patients n=84, carers n=49); (2) "usual practice" (patients n=86, carers n=48).	Secondary & tertiary HP (main focus); behavioural interventions (approach explicit); self-management.	Measures: knowledge of stroke & stroke services (primary), London Handicap Scale, physical function (Barthel Index), social function (Frenchay Activities Index), mood (Hospital Anxiety & Depression Scale), satisfaction (Pound Scale), carer mood (General Health Questionnaire-28). No statistical evidence for treatment effect on knowledge but trends that favoured (1). (1) associated with significantly greater reduction in anxiety at 3 & 6 months & consequently fewer 'cases'. No other significant differences between patient or carer groups for other outcomes, though trends favour (1).	Weak	Led by MDT including OT, PT, doctor and nurse (specialties not specified).
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Table 27. Occupational therapy - drug and alcohol problems: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(278)	Potential role for OTs in delivering brief motivational counselling to alcohol abusers on medical wards. (Health & social costs of alcohol abuse. Health professionals working in hospital environments have regular contact with this group)	RCT (feasibility study)	Adult inpatients with alcohol abuse; 2 NHS teaching hospitals, West of Scotland (urban, suburban)	(1) information leaflet + 40 mins 1-to-1 motivational counselling (FRAMES approach) (n=20); sessions encouraged participants to review drinking patterns & set realistic goals for alcohol consumption; (2) information leaflet only (n=20).	Secondary HP (main focus); behavioural interventions (approach explicit: FRAMES approach (person-centred counselling, social psychology)); drug/alcohol reduction, self-esteem/efficacy	Measures: Fast Alcohol Screening Tool, self-reported alcohol consumption, rationale for change. Group (1) reduced consumption but not significantly compared with (2). It is hoped that the study will open up debate on the role of OT & the effectiveness of interventions in this area.	Weak	OT-delivered; psychologist provided advice to OTs.
(279)	For clients with substance misuse problems to increase physical activities, engage in community-based activities, increase awareness of benefits of exercise & perceive health benefits. (People recovering from alcohol or drug problems often in poor physical condition with very sedentary lifestyles. Beneficial effects of	Before-and-after study (qualitative)	Adults with substance misuse problems; community (delivered via Mental Health Trust alcohol service), London (urban)	Group sessions over 6 weeks (n=10, 7 male, 9 alcoholism, 1 heroin use) including exercise counselling, discussion & advice, supervised exercise & client feedback. Counselling used CBT techniques for promoting exercise adherence, including goal setting, self-monitoring, decision balance sheets & relapse prevention techniques.	Secondary HP (main focus); behavioural interventions (approach explicit: CBT); ADL, drug/alcohol reduction; physical activity.	Measures: goal attainment (VAS), physical aspects of self-esteem (adapted Physical Self-Perception Profile), anxiety, insomnia, depression & social dysfunction (General Health Questionnaire), brief version of Seven Day Physical Activity Recall questionnaire. Ethnographic data also gathered. 5 completed post-treatment	Weak	Sessions run by an OT & exercise specialist Benefits claimed under independence, social integration, education & health, but not adequately evidenced. Value of paper reduced by omission of pre- & post- clinical outcome data. Low completion rates & integrity of intervention are

	exercise)					assessment. 4 made substantial gains in all areas relating to independence, integration, education & health. It is feasible for OTs to play a pivotal role in promoting fitness-oriented activities for this group. Controlled studies required with larger samples, longer follow-up periods & comparison of different intervention elements.		concerns.
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Table 28. Occupational therapy - Falls prevention: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(193)	To determine whether OT can enhance QoL by educating older people about the risk of falls. (Falls common in older people & associated with mortality, decreased mobility & reduced ability to perform ADL. Little research on OT falls prevention programmes)	Before-and-after study (quantitative)	People aged 65+; day care centre, primary care, residential care, Hounslow, outer London (urban).	Multifaceted falls prevention programme (14 sessions over 3 months) to enhance QoL (n=172): exercise programme (45 mins) & education focused on the risks/causes & prevention of falls.	Secondary HP (not main focus); behavioural interventions (approach not explicit); ADL, self-management, physical activity.	Measure: QoL (non-standardised self-administered questionnaire devised by authors). Programme can reduce impact of falls on older people by enhancing confidence to perform activities, which can increase QoL. Further research needed on effectiveness of anxiety management techniques & ascertain why older people may refuse to participate. Funders of falls services should ensure that prevention strategies based on best practice and cost-effective.	N/A	Education session led by the OT, PTs and podiatrists. Author-devised QoL measure.
(187)	To test a home-based educational intervention in reducing incidence & risk of falls & pressure sores in adults with progressive neurological conditions. (This group	RCT	People with progressive neurological conditions (Parkinson's disease & multiple sclerosis); patients' homes,	(1) home-based education (n=57): an expert panel advised on actions most likely to promote individuals' physical, social & psychological well-being. An OT visited participants to provide	Tertiary HP (main focus); behavioural interventions (approach explicit); ADL.	Measures: numbers of participants reporting falls & skin sores at 2-monthly phone calls during 12-month follow-up period. Significantly more falls & skin sores during follow-up & at	Weak	OT-led. Expert panel consisted of a research OT, consultant in neurology & rehabilitation medicine, GP, social worker, SLT, PT &

	is at risk of avoidable complications such as falls & skin sores. Falls can be prevented by identifying & modifying risk factors though no evidence for skin sore prevention)		Nottingham (urban, suburban)	education & information & discuss a personalized 12-month health action plan; (2) standardised printed information delivered to patients' homes (n=57).		12 months reported in (1) compared to (2). No difference in Extended ADL score. Person-centred education for this group can have negative effects & in some circumstances may even be harmful. This group needs preventive health care but assumptions about benefits of education & self-management interventions require empirical testing.		nurse.
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7 Speech and language therapists

7.1 Profile of the profession

Speech and language therapy is concerned with the assessment, diagnosis and management of disorders of speech, language, communication and swallowing in children and adults (280). Speech and language therapists (SLTs) work directly with patients, and also indirectly via families, carers, teachers, support workers and other professionals and agencies, to reduce the impact of these often isolating difficulties on people's wellbeing and their ability to participate in daily life (281).

SLTs usually work as part of teams which typically include nurses, occupational therapists, doctors and others (282). They practice in a wide variety of settings, such as health centres, hospitals (e.g. ENT departments), children's centres, prisons and young offenders' institutions, and patients' homes. Uniquely amongst the AHPs, many SLTs also work within educational contexts, including both mainstream and special schools. Client groups include pre-school and school-age children with speech, language and communication difficulties, such as language delay and stammering; children and adults with autistic spectrum disorders, cleft palate, hearing loss, fluency disorders, dysphagia (swallowing difficulties), and learning difficulties; and adults with aphasia, and head and neck cancer (283). Communication disorders are frequently the result of acquired neurological impairments and degenerative conditions, including stroke, head injury, Parkinson's disease and dementia. Intervention also takes account of the multicultural and multilingual needs of the population (282).

Speech and language therapy is a 'medium-sized' allied health profession, with just over 12,100 HPC-registered practitioners in the UK (49), around 7,000 of whom are employed within the English NHS (43). Significant numbers also work in private practice. The professional body is the Royal College of Speech & Language Therapists (RCSLT).

7.2 Results from the systematic review

Twelve studies met the criteria for inclusion in the review and have been divided into four groups: children with communication difficulties; adults with aphasia; adults with progressive neurological conditions; and improving children's communication (primary health promotion).

7.2.1 Children with communication difficulties

Six studies fell under this general heading (see Table 16), though the secondary health promotion interventions described are heterogeneous: four were parent-mediated education/training interventions relating to

cerebral palsy, expressive language delay and autism spectrum disorder; one examined support for teachers of primary school-age children with language comprehension difficulties; and one evaluated a programme to improve the self-esteem and communication skills of children and adolescents with cleft palate.

SLT for young children with motor disorders targets both the children themselves and their parents. Therapy for parents often involves training about communication and how to foster children's development. One well-established intervention, 'It Takes Two to Talk' (the Hanen Program for parents (HPP)) (284), developed in Canada, has become popular in the UK, though it had not been specifically evaluated for this client group. A before-and-after study aimed to investigate whether HPP is associated with positive communication change for parents and their pre-school children with cerebral palsy (285). Training comprised seven or eight group sessions and three home visits. In the group sessions a variety of teaching methods were used to convey information to parents and encourage active learning. In the home visits clinicians made videos of parents and children interacting, which were used for individual coaching of parents in the subsequent home visit. After training mothers initiated less and produced more responses and fewer requests. Children produced more initiations and more requests and provisions of information. Mothers' linguistic input did not change in amount or complexity. Changes were maintained four months later. According to the accompanying qualitative study, mothers' views of parenting did not change. The authors conclude that HPP may be associated with positive communication change for this group, though further investigation of its clinical effectiveness is warranted.

Parents and professionals can both play a role in improving children's expressive language development and both direct (clinician to child) and indirect (clinician to carer) approaches are currently used in the management of children with language delay. These approaches have not, however, been subject to rigorous comparative analysis in terms of either clinical or cost-effectiveness. Two non-randomised controlled studies targeting parents of pre-school children with language delay explored these issues.

The first compared a parent-based intervention (PBI) delivered by paediatric SLTs for pre-school children presenting with expressive language delay with current practice, observed in an actual healthcare setting in which parents follow a professional's advice (286). The emphasis of PBI was development of a child's expressive language by using daily routines and naturally occurring situations. Over a series of 11 fortnightly small group sessions, language objectives were set for 14 parents to work on at home with their child. The sessions explained each objective through structured teaching demonstrations. Practice activities were also devised to encourage parents to think about each objective flexibly. Each parent would implement the objectives at home in a different way, according to the particular

routines and interests of their child. Children who received PBI made significantly greater language gains than the current practice controls. Although the language gains delivered by PBI did incur some additional costs for the healthcare provider, there was no significant increase in cost per gain over general care. The authors include a discussion of options that could potentially save provider costs and increase the value of a PBI-based approach.

The aims of the second study (287) were to compare the Hanen Parent Programme (see above for details) with a conventional clinic-based direct SLT intervention, for pre-school-age children referred with language delay and their parents, in an inner-city location (Salford, North West England), in terms of its effectiveness and consequent suitability for this population. The study reported significant gains in language scores shown by 71% of the children over 12 months, with no statistically significant differences in scores between the two groups at any assessment point. However, HPP was twice as intensive (in terms of therapist time) as clinic therapy, based on average group size. The authors conclude that HPP may not be the intervention of choice for this population of children with moderate/severe language impairment and that a variety of parent and child factors, including parental beliefs and experiences, existing interaction style and the level of child language, need to be taken into consideration. Professionals should also ensure that any intervention programme is specifically targeted to a particular child's needs. It is suggested that the development of an interaction screening tool would be useful in helping to identify the parents and children who could benefit from such intensive intervention.

Increasing awareness of autism spectrum disorders (ASD) has led to a rise in the number of very young children being referred to community services for assessment, diagnosis and support. Intervention strategies are required that improve parent-child interaction through facilitating children's shared attention to activities. The psychologist-led, non-randomised controlled trial described by McConachie *et al.* (288) evaluated a home-based training course for 51 parents of pre-school children (24 to 48 months) with suspected ASD, designed to help them understand the disorder and to facilitate social communication with their children. The course was based on an established and tested programme ('More Than Words'), again developed by the Hanen Centre. SLTs were responsible for delivery of the intervention, which involved weekly sessions of group instruction and practice of facilitative strategies, with the aim of increasing fun interactions between parent and child, plus home visits for individual discussion and feedback. The course aimed to teach parents to structure the child's environment to motivate them to communicate, to create structured routines with opportunities for their child to initiate or respond, and to use visual cues to aid the child's comprehension. Controls received delayed access to the course. At seven months, a significant advantage was found for the intervention group in parents' observed use of facilitative strategies

and in children's vocabulary size. The course was also reported to have been well received by parents.

A 1997 Green Paper drew attention to the difficulties encountered in securing therapy services for children with special educational needs (289). These were seen as most pronounced in the area of SLT. The DfEE made available grant support to enable all English LEAs to create enhanced SLT services in partnership with the NHS and the voluntary sector. A pilot study by Miller (290) was part of this initiative and aimed to promote closer joint working between SLTs and teachers in order to increase support for primary school-age children with difficulties of language comprehension that significantly affected their access to the curriculum, and to reduce social exclusion. This before-and-after study, conducted by two SLTs within Telford & Wrekin NHS Trust (West Midlands), evaluated a project offering six-week blocks of classroom support and focussed SLT, while fostering skill sharing between therapists and teachers. This was achieved through team teaching, raising teachers' awareness of speech and language issues, small group work in the class and jointly discussing strategies and interventions with the teacher. The study reported that 14 of the 24 children "made measurable accelerated progress in expressive and receptive language" (though evidence was not provided to demonstrate this). Teachers also reported improved understanding of children's language needs, increased use of visual strategies and timetables (curricular access) and increased awareness of their own use of language. The most frequently cited negative aspect related to the amount of time needed. The author identified the need for larger scale research to consider both the effectiveness and costs of the intervention.

Children born with cleft palate experience long-term communication and psychosocial problems, such as low self-esteem and bullying. The study by Nash *et al.* (291), led by a psychologist and four SLTs within Wiltshire and Swindon Health Care NHS Trust, sought to enhance self-esteem and individual coping strategies, and boost their social competence as effective communicators. Twelve children and adolescents aged 8 to 14 with cleft palate from across England and Wales attended an intensive week long residential programme. At post-intervention assessment, lower scores were obtained for the majority of participants on the social anxiety (72.7%, n=8/11) and malevolent aggression scales (63.6%, n=7/11), compared with pre-intervention assessment scores. Social self-esteem scores were higher at post-intervention assessment for 58.3% (n=7/12) of the children.

None of the studies which fell under this heading utilised a randomised design, though three (286-288) used controls (the remainder were before-and-after studies). One study (288) was of moderate quality (though the qualitative study reported in Pennington *et al.* (285) was strong), its weaknesses including selection bias and possible contamination. For example, all of the children had concurrently attended some kind of playgroup or educational program, and many had received some specialist

provision in the previous seven months. The remaining studies were weak: Miller (290) and Nash *et al.* (291) were small-scale initiatives, with numerous weaknesses of design and execution and insufficient information provided about their aims, findings and other key aspects. Baxendale & Hesketh (287) reported severe recruitment and consent problems, potentially leading to high selection bias. Gibbard *et al.* (286) also suffered from missing information and a number of design weaknesses, including dubious intervention integrity (for example, parental compliance with PBI was not measured and the parental diaries were suspected of being unreliable). Lack of randomisation suggests that the internal validity of the study is likely to be poor. This was the only study within this group to include an economic evaluation, which was a cost-effectiveness analysis of moderate quality, suffering in particular from the fact that parental costs were not adequately measured (292).

Table 29. Speech and language therapy - Children with communication difficulties: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(285); (293)	To investigate if the Hanen Program is associated with change in interaction between children who have motor disorders & their parents. (SLT for young children with motor disorders targets children & their parents. SLT for parents often involves training about communication & how to foster children's development.)	Before and after study; qualitative study	Children (19–36 months) with non-progressive motor disorders, & their mothers; home settings in England and Australia.	'It Takes Two to Talk' (the Hanen Program for Parents) (n=11 families): 7 or 8 150-min group sessions + 3 home visits over c.13 weeks. Group sessions: variety of methods used to convey information & encourage active learning (e.g. short talks, demonstrations, role play, appraising videoed interactions). All received the parents' guide <i>It Takes Two to Talk</i> . Home visits: videos of parents & children interacting, used for individual coaching of parents in subsequent home visit.	Secondary & tertiary HP (main focus); behavioural interventions (approach explicit); parenting behaviour/skills.	Measures: spoken output (Speech Production Rating Scale), expressive vocabulary (MacArthur Communicative Development Inventory), various standardized language comprehension tests. Mothers initiated less & produced more responses & fewer requests. Children produced more initiations & more requests & provisions of information. Mothers' linguistic input did not change in amount or complexity. Changes maintained at 4 months. Mothers' views of parenting did not change. Programme may be associated with positive	Weak (before and after); Strong (qualitative)	SLTs involved in planning, delivery & evaluation.

						communication change for this group. Further investigation of clinical effectiveness warranted.		
(286)	To compare parent-based intervention for preschool children with expressive language delay with current practice. (Parents & professionals can both play a role in improving children's expressive language development, however alternative treatments have not been rigorously analysed.)	CCT (non-randomised); cost-effectiveness analysis (CEA)	Parents of pre-school children with expressive language delay; primary care, Portsmouth PCT.	(1) Parent-based intervention (n=12): 11 fortnightly small group sessions (c.90 mins), language objectives set for parents to work on at home with their child; clarified each objective through structured teaching demonstrations for each language objective; practice activities devised during sessions to encourage parents to think about each language objective flexibly; (2) current observed practice (n=10).	Secondary HP (not main focus: treatment); behavioural interventions (approach explicit); self-management, parenting behaviour.	Measures: parental diaries of child's language use at home, analysis of conversation, clinical tests of comprehension & expression, therapy costs to the PCT, cost of attendance to parents. Group (1) made significantly greater language gains than (2). Although the language gains from (1) did incur some additional costs for the PCT, no significant increase in cost per outcome gain over (2).	Weak (CCT); Moderate (CEA)	Paediatric SLTs delivered (1) & (2) & carried out evaluation. Commentary on economic evaluation in (292).
(287); (294,295)	To compare the Hanen Parent Programme with clinic-based, direct intervention. (Both direct & indirect approaches currently used for	CCT (non-randomised)	Parents of pre-school children aged 2;06-3;06 with diagnosis of language impairment; home & pre-school settings,	(1) The Hanen Program for Parents (see above (285)) (n=19); (2) conventional clinic-based SLT (n=18).	Secondary HP (main focus); behavioural interventions (approach explicit); parenting behaviour	Measures: receptive & expressive language (PLS-3 UK), parent-child interaction (children's spontaneous	Weak	Developed, delivered & evaluated by SLTs.

	language delay but little evidence on relative effects.)		Salford, North West England (urban).			speech & changes in parent communication strategies), mean length of utterance, proportional number of utterances of parent & child, parent language-modelling techniques, SLT time. Significant gains for (1) in language scores in 71% of children; no statistically significant differences between groups. (1) twice as resource-intensive as (2).		
(290)	To promote joint working, skill-sharing & understanding between SLTs & teachers in order to increase support for children with language comprehension difficulties. (Need for SLTs & teachers to work more closely together to enhance access to	Before and after study	Primary school-age children with language comprehension difficulties; mainstream primary education, Telford & Wrekin, West Midlands.	6-week blocks of classroom support & focussed SLT (n=73 children), while fostering skill sharing between therapists & teachers (team teaching, raising teachers' awareness of SLT issues, small group work in class, discussing strategies & interventions with the teacher).	Secondary HP (main focus); approach unclear; ADL (communication skills)	Measures: information on childrens' progress (collected by SLTs), teacher questionnaire, meetings, discussions. SLTs & teachers described changes in their own understanding after the project & described shared activities focusing their joint attention on students. Focus	Weak	Developed, delivered and evaluated by SLTs.

	the curriculum & reduce social exclusion.)					was not only the language needs of the children but also the communication skills of the adults. The most frequently cited negative aspect of the project related to time needed.		
(291); (296)	To enhance self-esteem, coping & social competence as effective communicators among children with cleft palate, through intensive residential group work. (Children experience long-term communication & psychosocial problems such as low self esteem & bullying.)	Before and after study	Children & adolescents born with cleft palate; residential programme (setting not described)	Intensive 1-week residential programme (n=12, ages 8-14, 3 female) incorporating cognitive, psychosocial & emotional dimensions of communication; coping strategies for teasing/bullying; self-esteem & assertiveness training; listening skills; phonetic & phonological levels of speech; the use of "best" speech; & social skills.	Secondary HP (main focus); behavioural interventions (approach not explicit); self-management, self-esteem/self-efficacy.	Measure: Emotional Behaviour Scales. Lower scores for the majority on the social anxiety & malevolent aggression scales compared with pre-intervention. Social self-esteem higher for 58.3%. Results suggest learning to be a competent communicator is more pertinent to psychosocial welfare & QoL than continuing to pursue improved speech, which may not only be unattainable but may also adversely affect the child's perception of his/her own capabilities.	Weak	Programme delivered by 4 SLTs & a psychologist. Based on the findings of postal survey on the experience of 303 children with cleft palate.

(288); (297)	To evaluate a training course designed to help parents understand autism spectrum disorder (ASD) & facilitate social communication with their young child. (Rise in number of young children referred to community services. Strategies needed to improve interaction.)	CCT (non-randomised)	Children aged 24 to 48 months with suspected ASD; home settings, North East England	(1) Hanen Centre 'More Than Words' course (n= 26): weekly sessions (3 months, 20 hours) of group practice of strategies to increase fun interactions between parent & child, teach parents to structure the child's environment to motivate them to communicate, create structured routines with opportunities for child to initiate or respond & use visual cues to aid comprehension; 3 home visits for individual discussion; mutual support & sharing of information; (2) delayed access to (1) because it not available at the time child's difficulties were identified (n=25).	Secondary ('not core autism' group) & tertiary (ASD group) HP (main focus); behavioural interventions (approach explicit); parenting behaviour (communication skills).	Measures: child vocabulary (MacArthur Communicative Development Inventory), social communication skills (Autism Diagnostic Observation Schedule), behaviour problems (Behavior Screening Questionnaire), parent's use of facilitative strategies (Joy and Fun Assessment, created for study), parental stress (Questionnaire on Resources & Stress), adaptation to the child (Parent Feelings Questionnaire). "Significant advantage" for group (1) in parents' observed use of facilitative strategies & children's vocabulary size. Course well received by parents & has measurable effect on both	Moderate	Psychologist-led. SLTs responsible for delivery.
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						parents' & children's communication skills.		
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7.2.2 Adults with aphasia

Three studies focused on aphasia (see Table 30), an acquired language disorder in which there is an impairment of any language modality, including difficulty in producing or comprehending spoken or written language. It is not a condition in itself, but a symptom caused by pre-existing brain damage as a result of stroke, head injury, Alzheimer's disease or brain tumours. The impact of aphasia on social participation and psychological well-being is well recognised but still not fully explored. Innovative practices and group interventions are recommended, but detail and evidence of effectiveness remain limited. All three included studies used a before-and-after design to evaluate education, training and support interventions for adults with aphasia (tertiary health promotion). Health promotion was the main focus in all three interventions.

One intervention (298) aimed to support people with chronic moderate aphasia to develop communication and conversation skills, promote an understanding of disability and rights, and engage in social participation. This SLT-led group intervention involved a "social model approach" (not described in detail) and the use of 'Total Communication', which makes use of a number of modes of communication such as signed, oral, auditory, written and visual aids, to support conversation. Seven people (average age 68 years 11 months; 5 men, 2 women) participated in the programme, which also involved two care workers and a disability rights worker. Group activities included topic discussion, information and experience sharing and support, exploration of the social model of disability and aphasia, and discussion of legal rights, benefits, and disability services. Statistically significant beneficial changes in conversation experiences (many relating to life participation) and, to a lesser degree, in conversational abilities, were reported. Improvements in psychological well-being were also reported for some participants. The authors concluded that appropriately planned group intervention can produce benefits in conversation, life participation, and psychological well-being for this patient group, and highlighted the need for innovative approaches and the value of partnership working.

The other two studies were concerned with aphasia acquired specifically as a result of stroke, the commonest cause of adult disability in the UK. In an attempt to help address identified gaps in knowledge and information about stroke treatment and services, one study (185) described a group intervention which provided stroke survivors with aphasia, their carers and families with information, support and advice. The programme was delivered by members of the multi-disciplinary stroke team, which included nurses (who led the intervention), SLTs, occupational therapists, physiotherapists, dietitians and social workers, within an inner-city London Hospital stroke rehabilitation unit. Patient satisfaction was the only outcome measure and 76% found the information useful, relevant and easy to

understand. Lack of Bengali language support (materials and interpreters) was identified as a problem for this population.

The investigation of conversational interaction in aphasia and its therapeutic implications has received much interest. It is increasingly accepted that people with aphasia cannot be treated in isolation but, rather, as part of a social unit, and training conversation partners has been shown to mitigate the disabling effects of the condition. An SLT-led study by Cunningham & Ward (299) evaluated a programme to train conversation partners of aphasic people, based on "Supported Conversation for Adults with Aphasia" (SCA) (300), a theoretically driven approach emphasising the interactive strategies of a conversation 'dyad'. Four adults (aged 47-75; 3 female, 1 male) and their partners participated in the programme, which consisted of five one-to-one sessions held in participants' homes and covered knowledge of aphasia and conversation, supportive communication competences and strategies, feedback on videoed interactions, and role play. Results of the evaluation reported that three of the four couples increased their use of gesture and the proportion of successful repair sequences, although these changes were not statistically significant. Self esteem was not improved. The authors conclude that working with couples can produce beneficial effects, but that further research may help establish who will benefit from this approach, and the optimal number of sessions.

Problems with the design of the three studies, which were all uncontrolled and used qualitative evaluation methods, mean that few conclusions can be drawn. The study evaluating the SCA programme (299) was of moderate quality and value. It had high internal validity but limited generalisability due to very small numbers (N=4) and lack of information on recruitment procedures. The other two studies (185,298) were both small-scale local evaluations with numerous flaws in design, execution and presentation.

Table 30. Speech and language therapy – Adults with aphasia: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(298)	To explore the experience of aphasia within the context of communication, life participation & psychological well-being in people with chronic aphasia following a group intervention involving a social model approach. (Impact of change in communication, life participation & psychological well-being in aphasia is recognised but still not fully explored.)	Before-and-after study (qualitative)	Older people with chronic moderate aphasia; clinic, Leeds Metropolitan University.	Group programme (n=7) involving a social model approach to support conversation (11 weekly 2-hr classes). Included: development & use of Total Communication & strategies to improve conversation exchange; topic discussion; information & experience sharing & support; exploration of the social model of disability & aphasia; discussion about legal rights, benefits, & disability services.	Tertiary HP (main focus); behavioural interventions (a "social model approach"); ADL (communication skills), self-esteem/efficacy (understanding of disability & rights, social participation)	Measures: Conversational Analysis Profile for People with Aphasia, Visual Analogue Self-esteem Scale, Hospital Anxiety & Depression Scale. Evidence of statistically significant beneficial change in conversation experiences & conversation abilities. Beneficial changes for some in psychological well-being. Due to the small & varied sample & lack of evidence of serious reduction in well-being at the outset, results should be evaluated with caution. However appropriately planned group intervention using a social model approach can produce benefits in conversation, life participation, & psychological well-	Weak	Led by 2 SLTs, 2 care workers and a disability rights worker.

						being. Highlights need for innovative working and value of partnership working.		
(185)	To provide stroke survivors with aphasia, carers & families with information, support & advice. (Stroke the UK's commonest cause of adult disability. Information provision is lacking & current information may be difficult for patients with impairments such as aphasia to understand.)	Before-and-after study (qualitative)	Adult stroke survivors with aphasia & their carers; NHS Hospital stroke rehab unit London (inner-city)	7 education & advice sessions given by various members of the stroke recovery team (frequency & duration of sessions not specified)	Tertiary HP (main focus); behavioural interventions (approach not explicit); ADL, self-management, healthy eating, physical activity, self-esteem/efficacy, sexual behaviour.	76% found the information useful, relevant and easy to understand. Lack of language support (interpreters and materials) for Bengali-speaking clients identified as a barrier.	Weak	Nurse-led. MDT also included PT, OT, dietitian, SLT, pharmacist, social workers. Small scale local evaluation of a local initiative. Virtually no information on design or execution of evaluation.
(299)	To evaluate a programme to train a relative/friend to communicate more effectively with an aphasic partner. (People with aphasia cannot be treated in isolation but as part of a social unit. Training conversation partners shown to impact on disabling effect of aphasia.)	Before and after study (qualitative)	Adults with aphasia following stroke & their conversation partners; home setting, Derby, East Midlands.	'Supported Conversation for Adults with Aphasia' (SCA): 5-week (1.5 hours/week) 1-to-1 programme (n=4, age range 47-75) to train conversation partners at home. Included education, video feedback & role-play. Covered knowledge of aphasia & conversation; supportive communication competences &	Tertiary HP (main focus); behavioural interventions (approach explicit: SCA); ADL (partner conversation skills).	Measures: Analysis of videoed conversations, Visual Assessment for Self-Esteem Scale (VASES), Hospital Anxiety & Depression Scale (HADS) (partners only). 3/4 dyads increased use of gesture & the proportion of successful repair sequences increased, although changes not statistically	Moderate	Developed, delivered & evaluated by SLTs.

				strategies.		significant. No significant differences on HADS but differences between aphasics & non-aphasics on VASES. Suggests that working with couples can produce beneficial effects. Future research may establish who will benefit from this approach & the optimal number of sessions.		
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7.2.3 Education for adults with progressive neurological conditions

Two controlled studies described educational interventions targeting adults with progressive neurological conditions, including Parkinson's Disease (PD) and Multiple Sclerosis (MS) (see Table 31). Health promotion was the main focus of both interventions.

Drooling and difficulty swallowing saliva is common in people with PD, however there is little research into the effectiveness of treatments to reduce drooling. A study by Marks *et al.* (301) compared the efficacy of two strategies to control drooling - behaviour modification to consciously increase the frequency of swallowing and botulinum toxin injections to reduce saliva production - against no treatment (control) for older people with PD (average age 64.8 years). The SLT-led behaviour modification arm consisted of verbal one-to-one advice and information, information and advice sheets, weekly telephone support and swallow modification via a reminder brooch used at home daily for four weeks. Self-reported drooling improved for both treatment arms at one and three months. According to the authors, the behaviour modification intervention is low cost, since it involves just a single therapy session, weekly phone calls and a progress appointment, and could be delivered by domiciliary SLTs. However, patient motivation was identified as an important factor relating to the effectiveness of the intervention, and adequate hearing, intact sensation and fine motor movement are prerequisites for independent use of the reminder brooch.

The second study (187) evaluated the effects of a home-based educational intervention in reducing the incidence and the risk of falls and pressure sores in adults with progressive neurological conditions, including PD and MS. It was led by occupational therapists and suggested that education for people with progressive neurological conditions can have negative effects (see Chapter 6).

Both studies were methodologically weak. Marks *et al.* (301) was described as randomised, but the method of randomisation was not described. It also contained numerous other weaknesses of design and analysis (e.g. no statistical measure of significance of findings), and problems of missing information, which severely limit its usefulness.

Table 31. Speech and language therapy – Education for adults with progressive neurological conditions: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(301); (302)	To assess the efficacy of 2 therapeutic strategies to control drooling in Parkinson's disease (PD). (Drooling & difficulty swallowing saliva common in PD but little research into effectiveness of treatments)	CCT (claimed to be randomised)	Older people with PD; NHS hospital outpatients, Central London.	Mean age 64.8 years. (1) behaviour modification: written & verbal 1-to-1 advice & information, weekly phone support, swallow modification via reminder brooch used at home for 4 weeks; (2) botulinum toxin injections to reduce saliva production; (3) no treatment (control).	Tertiary HP (main focus); behavioural interventions (approach explicit); self-management.	Measures: drooling rating scale, stimulated saliva flow, swallowing function & frequency. Self-reported drooling improved for both arms at 1 & 3 months. Low cost (1 therapy session, phone calls & progress appointment). Could be delivered by domiciliary SLTs. Self selection & motivation identified as important issues.	Weak	SLT-led.
(187)	To test a home-based educational intervention in reducing incidence & risk of falls & pressure sores in adults with progressive neurological conditions. (This group is at risk of avoidable complications such as falls & skin sores. Falls can be prevented by identifying & modifying risk factors though no evidence for skin sore	RCT	People with progressive neurological conditions (Parkinson's disease & multiple sclerosis); patients' homes, Nottingham (urban, suburban)	(1) home-based education (n=57): an expert panel advised on actions most likely to promote individuals' physical, social & psychological well-being. An OT visited participants to provide education & information & discuss a personalized 12-month health action plan; (2) standardised printed information delivered to patients' homes (n=57).	Tertiary HP (main focus); behavioural interventions (approach explicit); ADL.	Measures: numbers reporting falls & skin sores at 2-monthly phone calls during 12-month follow-up. Significantly more falls & skin sores during follow-up & at 12 months reported in (1) than (2). No difference in Extended ADL score. Person-centred education for this group can have negative effects & in	Weak	OT-led. Expert panel consisted of a research OT, consultant in neurology & rehab medicine, GP, social worker, SLT, PT & nurse.

	prevention)					some circumstances may even be harmful. This group needs preventive health care but assumptions about benefits of education & self-management interventions require empirical testing.		
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7.2.4 Improving children's communication (primary health promotion)

Just a single study was concerned with improving the quality of communication for children with no pre-existing communication, speech or language difficulties, or other conditions (303) (see Table 32). This was an SLT-led evaluation of the established Hanen Early Childhood Educators Programme (304), a training programme for teachers of pre-school-age children attending nurseries, explored outcomes for both staff and children following staff participation. The programme, which consisted of group learning and individual video feedback sessions, aimed to help teachers provide a rich interactive language learning environment for children and therefore, indirectly, to improve children's language and interaction skills. Adults were encouraged to adapt their language and interactive style to meet the needs of individual children. Results suggested, however, that the training programme failed to bring about improvements in children's receptive and expressive language skills, though changes were observed in their social interaction skills. Staff changes included increased skills and confidence in identifying and supporting children with speech and language difficulties, as well as positive changes in their interaction styles.

This study was methodologically weak, suffering in particular from poor blinding and a high drop-out rate.

Table 32. Speech and language therapy - Improving children’s communication (primary health promotion): included study

Ref	Aims	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(303)	To evaluate the Hanen Early Childhood Educators Programme, exploring outcomes for both staff & children.	CCT (non-randomised); qualitative study.	Teachers & learning support assistants of pre-school-age children; 2 nurseries, Northern Ireland.	(1) Hanen Early Childhood Educators Programme (at 1 nursery) to help teachers (all female) provide an “enriched interactive language learning environment” & indirectly to improve children's language & interaction skills; adults encouraged to adapt their language & interactive style to meet the needs of individual children; 15 hours of group learning & individual video feedback sessions; (2) no intervention (control nursery).	Primary HP (main focus); behavioural interventions (approach explicit); other.	Measures: standardised tests of children's language, attention, listening & social skills & fluency in conversation (observed by SLTs), informal screen of nursery rhyme awareness, questionnaires & “sessional evaluation forms” on teachers': changes in skills & confidence, perceptions of changes in interaction styles, perceptions of changes in children, satisfaction with training. Children: no change in receptive & expressive language skills; changes observed in social interaction skills. Staff: improved skills, confidence in identifying & supporting children with difficulties, & interaction styles. Highlights methodological difficulties inherent in evaluating training effects & the need for further research.	Weak	SLT-led. Programme described in (304).

8 Podiatrists

8.1 Profile of the profession

Podiatrists (or chiropodists) deal with the assessment, diagnosis and treatment of the lower limb and are qualified to treat people with arthritis, diabetes, nail surgery and sports injuries. Though they work with people of all ages and with a wide range of podiatric problems, they play a particularly important role in helping older people to stay mobile and independent (305).

The role of the podiatrist has developed significantly in recent years and the scope of podiatric practice now encompasses four key areas: general clinics, biomechanics, high risk patient management and surgery (306). Podiatrists begin their careers working within general clinics, which involves providing assessment, evaluation and foot care for a wide range of patients. Most podiatrists continue to engage in some general practice work but tend in time to specialise.

Biomechanics is concerned with preservation, restoration and development of the function of the foot and its associated structure. It includes a number of areas of practice, such as sports injuries, the practitioners of which are largely self-employed and work with individual athletes or sports teams, and podopaediatrics, since many children present with developmental biomechanical problems, and many lower limb problems suffered by children are biomechanically related. Podiatrists use numerous biomechanical investigations in the assessment of their patients, and many biomechanical problems are treated with orthotics (custom made insoles), which are either manufactured by podiatrists themselves or supplied via commercial or NHS orthotic labs based on prescriptions written by the podiatrist.

Many podiatrists specialise in working with patients who are classed as high risk, suffering from an underlying condition, such as diabetes, rheumatoid arthritis, cerebral palsy, peripheral arterial disease and peripheral nerve damage, that puts their legs and feet at increased risk of injury and disability. Podiatrists provide assessment, treatment and patient advice in order to reduce the long-term and potentially very serious problems that can result, including amputation. Podiatric intervention with such patients can reduce amputation rates by 40%.

Finally, surgery is an area of clinical practice that many podiatrists are involved with at some stage in their careers. Podiatrists are qualified to administer local anaesthetic and trained in a number of surgical procedures, including nail and minor soft tissue surgery.

Some practitioners go on to train as podiatric surgeons, who surgically manage bone, joint and soft tissue disorders of the foot.

Podiatry is a 'medium-sized' allied health profession, with just over 12,500 HPC-registered practitioners in the UK (49). However, only around 3,800 of these are employed within the English NHS (43), one of the lowest proportions among the AHP groups, reflecting the fact that podiatrists work predominantly within private practice and other environments, such as the leisure industry and occupational health. The professional body is the Society of Chiropodists and Podiatrists.

8.2 Results from the systematic review

Eight studies met the criteria for inclusion in the review. These fell into three categories: diabetes, general podiatric self-management, and falls prevention and older people.

8.2.1 Diabetes

Three of the studies related to secondary or tertiary health promotion by podiatrists in relation to diabetes or diabetic foot (see Table 33). In all of the studies, adults with diabetes were targeted and health promotion, in the form of health education and the acquisition of self-management skills, was the main focus of the intervention and evaluation.

Foot ulceration is a major cause of hospital bed occupancy, and diabetic patients account for 45-70% of all non-traumatic lower limb amputations. The first study (307), a cluster randomised trial led by hospital medical specialists and conducted within primary care, aimed to reduce risks of diabetic foot complications by improving patients' attitudes towards and knowledge of diabetic foot care, and health professionals' knowledge and the appropriateness of their referrals. An educational programme to train primary care teams in integrated foot care, which also involved training diabetic patients in foot care/self-care, was established. Academic podiatrists helped develop and evaluate the intervention, and designed and delivered the educational programme and the training to support it. Patient knowledge was reported to have improved in both groups, and patient attitudes toward foot care/self-care improved significantly more in the intervention than in the control practices. Staff knowledge improved significantly more in the intervention practices and appropriateness of referrals improved in intervention practices, but not in the controls. The need for longer-term evaluation to measure the impact on clinical outcomes (e.g. amputation rates) was identified.

Type 2 diabetes and its morbidity is more prevalent in South Asians in Britain, although rates in all groups in inner cities seem to be rising as populations age. In the 1990s official efforts were made to transfer much diabetes care towards primary care (314) so that hospital teams could concentrate on complication management and provide support for general practice. The second study (214), an RCT conducted within an inner-city primary care setting with >20% South Asian population, investigated whether a secondary–primary care partnership education package could improve knowledge and self-care skills among South Asian patients with Type 2 diabetes. Patients attended a number of specialist lead clinics and were seen by one of a diabetes specialist nurse, dietician or chiropodist alongside a practice nurse. Despite a mean of four visits per patient, the intervention had no impact on diabetes knowledge, awareness or self-management at one year (though the drop-out rate was very high). The authors concluded that the intervention did not transfer information effectively, and that similar problems are likely to arise in other similar communities. Different methods of clinician/patient information exchange need to be developed for this patient group.

The third study (201) aimed to help newly diagnosed adult diabetics and their carers to acquire the knowledge, skills and attitudes required to successfully manage their condition. This dietitian-led before-and-after study also involved podiatrists and practice nurses.

Health promotion was the main focus of all the studies, and the methodological quality of all three was weak. Selection bias and high drop-out rates were particular problems for the two randomised studies (214,307), and the before-and-after study (201), though well-designed, is plagued by low recruitment rates which reduce its reliability and limit the conclusions that can be drawn.

8.2.2 General podiatric self-management

Podiatry services are one of the most frequently requested services in primary care, and high demand for podiatric care has resulted in the restructuring of some NHS podiatry departments to cope with increasing patient numbers and static or reduced funding. Three studies were found which promoted foot care self-management in order to help address these demand issues (see Table 34). All involved secondary health promotion.

Table 33. Podiatry – diabetes: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(307)	To improve patients' attitudes towards and knowledge of diabetic foot care & healthcare professionals' foot care knowledge & appropriateness of their referrals. (Foot ulceration a major cause of hospital bed occupancy. Diabetics account for majority of lower limb amputations. Suboptimal primary & community care.)	Cluster RCT	Adults >18 years with diabetes; primary care (10 towns in Devon).	54% male. (1) Integrated care model (n=5 GP practices): educational programme (no details given) to train practice teams in integrated foot care, focusing on annual review. Separate education programme delivered to chiropodists. Also trained patients 1-to-1 in their roles & responsibilities in self care. Foot care leaflets distributed to staff to give to patients to reinforce verbal education; (2) no intervention, continued with standard care (n=5 GP practices).	Secondary HP (main focus); health education (approach not explicit); self-management, self-esteem.	Measures: patients' attitudes on value & importance of foot care, patients' & professionals' foot care knowledge (questionnaires), pattern of service utilization. Attitudes towards foot care improved in both groups. Patient knowledge about diabetic foot improved significantly in both groups but no significant difference between groups. Professionals' knowledge improved in group (1). No improvement in (2) with a significant difference in change between groups. Appropriate referrals from (1) practices to specialized foot clinic rose significantly compared with (2).	Weak	Design led by hospital medical specialists. Chiropodists involved in delivering the intervention alongside GPs & practice nurses. Academic podiatrists & GPs helped develop intervention & deliver the training to support it.
(214)	To assess whether a	RCT	South Asian	(1) secondary-primary	Tertiary HP	Measure: interview on	Weak	Patients seen at

	secondary–primary care education package could improve knowledge & self-care skills among South Asian patients with Type 2 diabetes (T2D). (T2D more prevalent in South Asians in Britain, although rates in all groups in inner cities seem to be rising as populations age)	(randomised by GP practice)	adults with T2D; primary care (inner-city Manchester)	care 1-to-1 education to improve patient knowledge & self-care skills (n=108): clinic sessions 4 times over the year. Urdu & Punjabi-speaking health professionals or interpreters at each session; (2) routine care (n=103).	(main focus); health education (approach not explicit); self-management, healthy eating	knowledge, awareness & self-management of diabetes using 94-item semi-structured questionnaire (based on validated tools). Despite a mean of 4 visits/patient, (1) had no impact on diabetes knowledge, awareness or self-management at 1 yr (though drop-out rate very high). (1) did not transfer information effectively & similar problems likely to arise in other similar communities. Different methods of clinician/patient information exchange need to be developed for this group.		least once by each of diabetes specialist nurse, dietitian or podiatrist alongside a practice nurse.
(201)	To help newly diagnosed diabetics acquire the knowledge, skills & attitudes required to successfully manage their diabetes. (People newly diagnosed with diabetes want information & support to help them acquire the knowledge & skills to successfully manage their	Before and after study (qualitative)	Adults recently diagnosed with diabetes & their carers; public libraries, North West England (mixed urban/rural)	A selection of books, magazines, videos & leaflets available for loan in 19 public libraries allow health professionals to direct the patients to materials that are suitable for them (n=65 audit respondents: 22 borrowers (73% female), 43 non-borrowers). Materials focused on dietary	Tertiary HP (primary focus); health education (approach not explicit); ADL, self-management, healthy eating.	Measures: 2 questionnaires (borrowing information; knowledge & understanding of diabetes based on Charing Cross Hospital Dept of Endocrinology Non-Insulin Dependent Patient Questionnaire. Knowledge & understanding of diabetes, its treatment & self-care: borrowers	Weak	Dietitian-led; chiropodists & practice nurses involved in publicising initiative to their patients. Also involved librarians. A well designed study but reliability significantly reduced by

	condition)			information & advice. Available in Asian languages, in large print & on audiotape.		appeared to have improved their knowledge 10% more than non-borrowers. Problems included influencing behaviour of health professionals and library resource issues. Claimed to be cost effective.		failure to recruit sufficient numbers. Findings are suggestive only.
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Two of the studies targeted older people. The 'FOOTSTEP' trial (308) was an RCT conducted in West Yorkshire which investigated the clinical- and cost-effectiveness of a primary care self-management programme (SMP) for basic foot care in the elderly (aged 60+), as a means of preventing non-urgent cases from blocking access to podiatry services for other priority groups. Conditions targeted were those requiring basic foot health treatment, serious foot morbidities, such as diabetes and vascular disease, being excluded. The SMP, which was based on guidelines developed by the Society of Chiropodists and Podiatrists and Age Concern, and informed by interviews of elderly service users during the project's pilot phase, consisted of a one hour training session, led by a podiatrist and run as a small group workshop. It covered foot hygiene, footwear and other issues and aimed to increase knowledge and skills of self-care in order to prevent symptoms and maintain quality of life. Participants also received a self-care kit for home use, and a 24-hour telephone helpline offered advice, support and encouragement. SMP participants had lower foot disability scores at six months than the usual care group, and returned for fewer treatments (39) than the controls (96). They also had a significantly better "enablement" score than the controls, although there was no difference in knowledge, or in foot morbidity. The authors identified the need for larger community-based research to be undertaken. This was the only podiatry-related study to include an economic evaluation, which found that the SMP was cost-effective (£10.92 per patient) compared with usual care (£10.71), once development costs (£4.29 per patient) were deducted.

The other study to target older people was the 'Sheffield Empowerment Project' (310,311), part of a reorganisation of podiatry services in Sheffield to cope with increasing demand, limited resources and high waiting lists for new patients. It examined whether low-risk patients (and relatives/carers) discharged from the podiatry service, which is based in a number of primary and secondary care sites across Sheffield, had been empowered to continue to provide their own foot care after attending a one-off foot health education and safe self-management talk, delivered in large groups. 77% of attendees felt that their foot condition had improved or remained the same, although the remainder thought that their feet had deteriorated. 40% of people reported that they had not been able to care for their own feet before attending a talk. At one year, 12% more people were able to care for their feet "very well", although the number of people who could provide their own foot care did not increase. The take was found to be useful by 60% of those who attended. The authors also claimed that the project resulted in

fast access to the service for high-risk patients and also eradicated the podiatry waiting list.

NHS podiatry departments have developed assessment tools to optimise caseload prioritisation and discharge both new and existing low-risk patients. The third study, an "audit of philosophy of care", aimed to establish the proportion of the existing caseload of an NHS Foot Health Service within a large health centre in South East London that could be discharged to self-care, and to maximise the length of time that patients self-manage (312). The author notes that motivational interviewing has been successfully used to reduce conflict and promote patient involvement in the decision on whether to discharge. Patients with manageable, asymptomatic foot conditions took part in a motivational interview conducted by a podiatrist. At the reassessment interview, 29% of patients were discharged, and at one year the discharged group was 17.4%. The author concluded that the use of motivational interviewing should be further researched.

Health promotion was the primary focus of all three studies. Methodological quality was variable. The 'FOOTSTEP' trial (308) was of moderate quality. Though well-designed, the 63% refusal rate among eligible participants indicates low acceptability of the programme (of those refusing, more than half reported lack of interest or preference for usual care), and a shortfall in recruitment means that the study is underpowered. The quality of the cost-effectiveness study was, however, weak: for example, it was unclear whether all the relevant costs and consequences were identified or appropriately valued/measured, no allowance was made for uncertainty in the estimates of costs and consequences, and the discussion of study results did not include all issues of concern to users (for further commentary see NHS Economic Evaluation Database (309)). The other two studies were methodologically weak. The evaluation of the 'Sheffield Empowerment Project' (310,311) was a relatively crude service evaluation that relied on reported behaviour and did not investigate processes or provide any clinical outcome data. Small numbers of patients were involved and no demographic data on either the population of service users or the sample were provided, so representativeness cannot be gauged. Data analysis was insufficiently rigorous, with no clear statement of findings. The value of the research is, therefore, very limited. Similar problems beset the motivational interviewing study (312) which, being a very small-scale audit of a sample of 69 patients, is also of limited value.

Table 34. Podiatry - general podiatric self-management: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(308)	To evaluate the clinical & cost-effectiveness of a self-management program to manage non-urgent demands for podiatry services by the elderly without compromising foot-related disability. (Podiatry one of the most frequently requested services in primary care. Elderly given priority access, blocking access for other priority groups.)	RCT; economic evaluation	Older people aged 60+ referred for podiatric consultation; primary care, West Yorkshire.	(1) 1-hr small group self-management training programme (n=78) covering foot hygiene, footwear etc. to increase self care knowledge & skills, prevent symptoms & maintain QoL; handbook & self care kit for home use; 24-hour helpline for advice & encouragement; (2) usual care (n=75).	Secondary HP (main focus); health education, behavioural interventions; self-management, hygiene improvement, self-esteem/efficacy.	Measures: Modified Foot Morbidity Index, Manchester Foot Disability Questionnaire, Foot Health Knowledge Questionnaire, Patient Enablement Instrument. At 6 months, group (1) had lower foot disability scores than (2), returned for fewer treatments (39 vs 96) & had significantly better "enablement" scores. However, no difference in knowledge or in foot morbidity. (1) cost-effective compared with (2) once development costs were deducted. Need for larger community-based research.	Moderate (effectiveness); Weak (cost-effectiveness)	Podiatrist-led. 2 research podiatrists carried out evaluation. Commentary on economic evaluation in (309).
(310); (311)	To examine if people discharged from a podiatry service after	Service evaluation (survey &	"Older people" (low risk foot conditions, no	One-off large class, 20-25 participants, duration unspecified	Secondary HP (main focus); health education,	Measures: self-administered questionnaire	Weak	Podiatrist-led.

	attending a foot health talk had been empowered to continue to provide their own foot care. (The service had undergone a redesign to cope with increasing demand, limited resources & high waiting lists).	qualitative study)	age data) & carers; various urban settings in Sheffield.	(69 people used service in 2005/6). Foot care information & HP to: explain the criteria for receiving podiatry treatment; improve foot health knowledge; encourage safe self-management.	behavioural interventions; ADL, self-management; hygiene improvement.	(n=40), interview (n=7). 77% felt their foot condition improved or unchanged, though the remainder thought their feet had deteriorated. At baseline 40% could not care for their feet. 12% more people able to care 'very well' at 1 year, however the number who could provide their own care did not increase after attending a talk. Talks found useful by 60%. Reportedly resulted in fast access for high-risk patients & eradicated podiatry waiting list.		
(312)	Use of motivational interviewing (MI) to establish the proportion of a non-high risk podiatry caseload that could be discharged to self-care & to maximize the return period for patients not discharged but able to partly self-care.	Before and after study; qualitative study.	Patients with self-manageable, asymptomatic foot conditions; podiatry clinic in large NHS health centre, South East London.	30-minute reassessment interview using MI, a non-confrontational, client-centred approach for encouraging behavioural change, over 5 months (n=69). Emphasis on maximising self-care &, where appropriate,	Secondary HP (main focus); behavioural interventions; ADL, self-management.	Measure: discharge rates. 29% were discharged at reassessment interview. At 1 year follow-up the discharged group was 17%. Apparent common acceptance of policy. Potentially stressful for podiatrist due to	Weak	Led by single podiatrist trained in motivational interviewing.

	(Long-term patients can be reluctant to consider self-care. MI can be successful in reducing conflict & promoting patient involvement in discharge decisions.)			discharge from the service.		scope for confrontation. The use & effectiveness of MI needs further research.		
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8.2.3 Falls prevention and older people

Around a third of people over 65 experience a fall each year, and injuries from falls are by far the greatest cause of hospitalisation among older people. With an increasingly ageing population, this has serious implications for health and social care services, and often severe consequences for those who fall, leading to loss of mobility, independence, dignity and confidence. The identification of risk factors is therefore crucial for falls prevention.

Two studies, both involving primary health promotion, addressed these issues (see Table 35). The first, a pilot study of the 'Sloppy Slipper' campaign conducted within Cardiff and Vale NHS Trust, South Wales, examined the impact of a slipper exchange programme for older people (313). The intervention was a joint initiative of the Trust, Age Concern and the Health Board, and part of the Welsh Assembly Government's annual 'Keep Well This Winter' education and support campaign. In 2003, over 3,000 people, most of them over 65, had visited A&E following a fall, and over 1,000 were admitted. Unsuitable footwear has been implicated in many falls which resulted in a hip fracture and slippers are the most common type of footwear worn at the time of falling. The project targeted sick/housebound residents and inpatients on the Trust's trauma wards. After assessment, they and their carers were given information and advice about falls and footwear. If their existing slippers were deemed unsafe, they were issued with a free replacement pair of well-designed, fastening slippers to reduce the immediate risk, reinforce the message and encourage compliance. Podiatrists within the Trust were responsible for intervention development, delivery and evaluation. Of the 56 participants, 75% were identified as needing added stability (i.e. their slippers were inappropriate due to unsuitable fastening or no slip-resistant sole). Potential or known fallers were identified in 70% of cases. All patients who received new slippers stated that they felt safer. In addition, 96% believed they experienced improved stability, and their confidence and independence either improved or remained the same. Further funding was secured to roll out the project across the two counties of the Trust. As well as monitoring footwear, this was intended to provide additional resources to undertake falls risk assessments and deliver health promotion and falls prevention advice to patients in their own homes. According to the authors, the project highlighted the importance of basic training in shoe fitting, the need for more conclusive evidence of the benefits of good fitting slippers to the older person, and the need for partnership between health and social care colleagues and with the voluntary sector. Although health promotion was the main focus of this intervention, quality

assessment was not carried out since the evaluation only assessed user satisfaction and compliance.⁷

The second study relating to older people and falls, of the effectiveness of a falls prevention programme involving exercise and education to enhance quality of life (193), was led by occupational therapists.

⁷ The authors stated their intention to undertake a more detailed evaluation to establish the effect of the campaign on the incidence of falls in this high-risk group. It is unclear whether such an evaluation took place.

Table 35. Podiatry - falls prevention and older people: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(313)	To evaluate the impact of a slipper exchange programme for older people. (Part of a multi-agency initiative ('Keep Well This Winter') to identify individuals at high risk of falling as a result of inappropriate footwear.)	Cross-sectional study (survey)	Sick or housebound residents & trauma ward occupants (aged 65+) & their carers; homes & NHS hospital, Cardiff, South Wales.	'Sloppy Slipper' Campaign: assessment of footwear (n=56); raising awareness; advice & information to patients & carers; provision of one-off pair of free well-designed, fastening slippers to reduce immediate risk, reinforce the message & encourage compliance; support & education for health & social care colleagues.	Primary HP (main focus); health education; ADL.	Intervention only evaluated in terms of user satisfaction & compliance. 75% patients identified as needing added stability. Potential or known fallers identified in 70% of cases. All patients receiving new slippers reported feeling safer. 96% believed they experienced improved stability (confidence & independence improved or remained the same). Scheme highlights importance of basic training in shoe fitting, need for better evidence of benefits of good fitting slippers to older people & need for partnership between health, social care & the voluntary sector.	N/A	Podiatrist-led.
(193)	To determine whether OT can enhance QoL by educating older people about the risk of falls. (Falls	Before-and-after study (quantitative)	People aged 65+; day care centre, primary care, residential care, Hounslow,	Multifaceted falls prevention programme (14 sessions over 3 months) to enhance QoL (n=172): exercise	Secondary HP (not main focus); behavioural interventions	Measure: QoL (non-standardised self-administered questionnaire devised by the authors).	N/A	Education session led by the OT, PTs & podiatrists.

	common in older people & associated with mortality, decreased mobility & reduced ability to perform ADL. Little research on OT falls prevention programmes)		outer London (urban).	programme (45 mins) & education focused on the risks/causes & prevention of falls.	(approach not explicit); ADL, self-management, physical activity.	Programme can reduce impact of falls on older people by enhancing confidence to perform activities, which can increase QoL. Further research needed on effectiveness of anxiety management techniques & ascertain why older people may refuse to participate. Funders of falls services should ensure that prevention strategies are based on best practice & are cost-effective.		Author-devised QoL measure.
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9 Arts therapists

9.1 Profile of the professions

The arts therapies are psychological therapies which use the arts, such as music, painting, dance, or drama, to enable clients to communicate and express themselves in a therapeutic environment, and to make sense of what they have created in the context of their life experience and their state of mind (315). They are particularly helpful for people who feel disengaged from their feelings or who find it too difficult to address painful experiences in words, and would therefore have difficulty engaging with talking therapies, such as Cognitive Behavioural Therapy (CBT). Arts therapists work with clients to use their creativity in a psychotherapeutic way, within a safe environment, whilst maintaining professional boundaries. They work with both individuals and groups of all ages in a wide variety of settings, such as mental health units/teams, NHS and private hospitals, special and mainstream education, child and family centres, prisons, palliative care units and the voluntary sector. Clients include people with head injuries, mental health conditions (such as dementia, schizophrenia and depression), autism, stroke, learning and speech disabilities, emotional and behavioural difficulties, and drug and alcohol problems.

The Department of Health and the Health Professions Council recognise three types of arts therapist: art, music and drama. *Art therapy* seeks to enable clients to effect change and growth on a personal level through the use of art materials. Clients who are referred to an art therapist need not have previous experience or skill in art, and the art therapist is not primarily concerned with making an aesthetic or diagnostic assessment of the client's images (316). *Music therapy* draws on the ability to listen and respond to music, which is universal and may remain unimpaired by illness, injury or disability, to help people communicate through music (317). It uses mainly improvised music and clients are encouraged to use a variety of percussion instruments to find their own personal 'voice' and to develop listening, communicating and relating. Music therapists accompany and support clients, listening and responding to them through the improvised music and building a shared understanding. *Dramatherapy* uses the performance arts to facilitate creativity, imagination, learning, insight and growth. Examples of artistic interventions the dramatherapist may employ include stories, myths, playtexts, puppetry, masks and improvisation (318).

The arts therapies are very small professions. Collectively, there are just over 2,500 HPC-registered arts therapists in the UK, with around 750 employed by the NHS in England (43,49). The professional bodies are the British Association of Art Therapists, the Association of Professional Music Therapists and the British Association of Dramatherapists.

9.2 Results from the systematic review

Just two studies meeting the inclusion criteria were found (see Table 36). Both were pilot studies, using qualitative methods, of primary health promotion interventions developed and led by dramatherapists, and both addressed the problem of suicide/parasuicide among school-age males within secondary education settings. Suicide rates among young people have been increasing for many years and it is the leading cause of death of males aged 15-24 years. Despite this, and the fact that arts therapists have worked in schools for some time (longer in special schools, but increasingly also within mainstream education), it has been reported that limited published information regarding their mental health promotion activities within these settings is available (319). Furthermore, few studies have examined the use of arts therapies in mental health promotion more generally.

The first study, a pilot of the *Labyrinth Project* (320), which also involved art therapists and dance movement psychotherapists, targeted teachers and aimed, by means of an education programme and group work, to increase their awareness of suicide/parasuicide among adolescents and develop skills in using arts therapies to address their social and emotional issues. Evaluation suggested that participants displayed statistically significant improvement in their knowledge regarding suicide and mental health issues among young people, relevant support services, and other matters, and in their skills in dealing with the emotional issues of young people and the use of the arts for addressing such issues. It was reported that the project also resulted in participants using some of the activities within their schools, and in some schools setting up their own arts therapy projects.⁸ The other study, *Speak Out* (321), targeted males aged 11-18, from both mainstream and special schools, directly and aimed to use improvised drama, dramatherapy techniques and small group discussions to promote their social and emotional development, communication skills, confidence and other attributes in order to reduce suicide and attempted suicide. Evaluation suggested that the majority of young males felt that their self-

⁸ This pilot study of the *Labyrinth Project* formed the basis of a subsequent, more substantial study which was published too late for inclusion in this review (319).

confidence and understanding of teachers and other adults had increased, and teachers reported increased confidence, self-esteem and pride in their work, improved behaviour and attitudes, and other benefits.

Both studies were methodologically weak and validity cannot be determined. Neither intervention was based on an explicit HP approach and in both cases the research design chosen was not appropriate to address the aims of the research, with over-reliance on self-perceptions and unstructured observations, and insufficient information was provided.

Table 36. Arts therapies: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(320); (319)	To increase teachers' awareness of suicide & parasuicide among adolescents & increase their skills in using arts therapies to address adolescents' social & emotional issues. (Increasing rates of suicide & self-harm among adolescents.)	Before and after study (qualitative)	Secondary school teachers & other education-related professionals (ultimately affected population: adolescents at risk of developing mental health problems, especially suicide and self-harm; secondary education (numbers & types not specified), North London & Hertfordshire (unclear whether urban/rural).	Pilot study of the 'Labyrinth Project' (n=c.35). Delivered in 2 formats: 1) 26-hr educational programme delivered at weekends; 2) 13-hr programme delivered at schools as part of teacher training activities. Included information giving, practical activities & small group work (size not specified).	Primary HP (main focus); health education (approach not explicit); self-esteem/self-efficacy.	Measures (self-administered questionnaire): awareness of teenage (para)suicide, support services & use of arts therapies to promote emotional & social wellbeing; skills in using arts therapies to promote teenagers' emotional & social wellbeing. Overall, participants showed statistically significant improvements in: knowledge regarding suicide/mental health issues of young people; relevant support services, networks & other projects; developing &/or improving skills in dealing with the	Weak	Developed, delivered & evaluated by university-based art, drama & dance movement psychotherapists. Secondary school teachers also involved in providing intervention.

						<p>emotional issues of young people & the use of the arts for addressing such issues (no data supplied).</p> <p>Participants rated delivery of the project as very good. The range, quality & simplicity of the arts activities used regarded as important features. Participants used several of these activities (and/or modified versions of them) with young people within their schools (no data supplied). "At least ten" schools set up their own arts therapy projects. Time pressures on teachers' availability to undertake the programme identified as a barrier to implementation. Need to develop closer working relationships between arts therapists & art</p>		
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						teachers.		
(321)	To use dramatherapy to increase emotional literacy among male adolescents in order to reduce suicide & attempted suicide. (Suicide the leading cause of death amongst males aged 15-24.)	Qualitative study.	Young males aged 11-18; 4 'standard' secondary schools, 1 special needs school (physical disabilities) & 1 special school (learning disabilities, challenging behaviours), East Riding of Yorkshire (urban) & Withernsea (rural).	Pilot of the 'Speak Out' project (n=c.200). Small groups (4-6) for pupils with special needs, learning difficulties & challenging behaviours. Groups of 12 from mainstream classes. Involved: small group discussion; dramatherapy techniques to encourage open discussion; creative sessions used improvised drama to promote: social & emotional development; communication skills; widening worldview; confidence & feelings of worth. Number, frequency & duration of sessions not specified.	Primary HP (main focus); behavioural interventions (approach not explicit); problem behaviour/aggression, self-esteem/self-efficacy, social skills.	Measures: anonymous feedback cards & self-completion questionnaires from participants measuring perceived improvement across 20 domains, formal group discussion, interviews with participants, dramatherapist & teachers. Knowledge, awareness, beliefs & attitudes, e.g. "Understanding teachers & other adults better": 60% reported this had improved a lot/quite a lot; self-esteem/self-confidence, e.g. "Helping you feel more confident with other young people": 85% reported a lot/quite a lot. Improvements reported in listening to others. Teachers' observations:	Weak	Single dramatherapist responsible for development, delivery & evaluation. Intervention was part of <i>Saving Lives: Our Healthier Nation</i> , which set the target to reduce the suicide rate by at least one fifth by 2010.

						increased confidence; pride in their work; greater self-esteem; behaviour improved in subsequent lessons; noticeable positive differences; improved attitude; more relaxed; more at ease with themselves; more approachable; willing to help others.		
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10 Radiographers

10.1 *Profile of the profession*

Diagnostic radiographers take the lead responsibility for the management and care of patients undergoing the full range of imaging examinations, as well as associated image interpretation, producing high-quality images on film and other recording media, using various types of radiation. They also increasingly lead on integrating these processes into the care pathway as members of the multidisciplinary team. *Therapeutic radiographers* provide care across the entire spectrum of cancer services and take the lead responsibility for the management and care of patients undergoing radiotherapy during the pre-treatment, treatment delivery and immediate post-treatment phases, using ionising radiation and, sometimes, drugs (42,322).

There are around 25,000 HPC-registered radiographers in the UK, over 15,600 of whom are employed by the English NHS (43,49). They now work in almost all areas of patient services, though there is evidence that they are moving away from large specialist centres to support developing community-based services (323). Within the NHS, radiographers practice across primary, secondary and tertiary care, including general practice. They also work within independent and private health care services, higher education, research establishments and other organisations, such as the armed forces, prisons, customs and excise, industry and veterinary practices (322).

Radiographers have been encouraged to expand and diversify their professional roles, and have done so in a number of areas, now performing many tasks previously restricted to nurses or doctors. Advanced and consultant posts were introduced a decade ago (324) and, despite very limited initial take-up, research points to widespread and continuing adoption of these emerging roles, with growing numbers of consultant posts as well as increasing diversification of practice within the primary and secondary sectors (323). For example, significant numbers of radiographers now perform interventional procedures and specialist gastrointestinal studies, are involved in treatment prescribing and report independently of radiologists. Almost all diagnostic radiographers are involved in audit. Alliances with non-radiological colleagues are likely to lead to further role expansion. Such roles are likely to be recognised as standard practice within the profession (323).

The professional body, the Society of Radiographers, represents more than 90 per cent of the UK's diagnostic and therapeutic

radiographers. The Society's charitable subsidiary, the College of Radiographers, is concerned with education, research and other activities in support of the science and practice of radiography.

10.2 Radiographers' role in health promotion

According to the profession's Curriculum Framework, radiographers are responsible for their patients' physical and psychosocial wellbeing while under their care, and for providing information, support and counselling (325). Health promotion and education are included within radiographers' scope of practice and they have a responsibility to "support patients and their families through the entire cancer journey from health promotion to end of life care" (322). A 2008 questionnaire survey of radiography practice, which obtained responses from 108 diagnostic and 33 therapeutic radiography managers, found that new roles are emerging in more holistic aspects of patient care, such as palliative care, health promotion and counselling (323). For example, a therapeutic radiographer with counselling skills is providing research-based support for patients who can self-refer or be referred by other radiographers, specialist nurses or doctors. However, only four NHS departments reported having counselling therapeutic radiographers.

The importance of radiographers' role as advocates for their patients has also been emphasised and patient advocacy is included in the subject's benchmark statement and in many radiographer job descriptions (326,327). At the societal level, the Quality Assurance Agency (327) has highlighted the important health promotion role of diagnostic radiographers in educating the general public about the risks and benefits of diagnostic imaging examinations in order that patients can make informed judgements about, and give their informed consent to, these procedures.

10.3 Results from the systematic review

Despite such policies, only two studies meeting the review's inclusion criteria were found (see Table 37). The first, a non-randomised pilot study (328), involved diagnostic radiographers and compared the effectiveness and acceptability of two versions of an intervention (awareness booklet vs. booklet plus interview) designed to promote awareness of breast cancer among older women and early GP self-referral (this is one of the few studies in the review to report user involvement in the design of the health promotion material). A significant improvement in knowledge of breast cancer symptoms (the primary outcome measure) were reported in both groups at one month, though this was more marked in the booklet-plus-interview group. Improvements in knowledge of risk of developing breast

cancer, increased confidence in their ability to detect early symptoms and increased frequency of self-examination were also reported for both groups. The study is of weak methodological quality, and the authors acknowledged the need for a multi-centre RCT comparing the two versions of the intervention, which has subsequently been carried out.⁹ The authors are also developing a proposal to Cancer Research UK for a much larger RCT involving the training of many more radiographers, and a quality assurance “toolkit” for possible roll-out of the intervention. The two radiographers on the research team have been involved in training NHS radiographers to deliver the intervention, and the authors envisage that other health professionals could be trained to deliver an adapted version within other settings, such as general practice or pharmacies (Caroline Burgess, personal communication, 23 April 2009).

The second study (97) aimed to use GP and patient education, delivered within GP practices by means of posters and leaflets, in order to reduce the number of unnecessary referrals for lumbar spine X-rays, in the context of a high incidence of ‘unnecessary’ requests for X-rays from patients with back pain. A physiotherapist was involved in planning and development alongside a radiographer and the radiologist who led the research. This before-and-after study reported that the number of referrals for X-rays reduced by 54%, though the percentage of ‘unnecessary’ referrals remained very high. The study is suggestive, but its value is somewhat reduced by a lack of clarity over whether *GP* or *patient* behaviour was being targeted.

Given the size of the radiography profession, which is the third largest of the AHP groups, the lack of further eligible studies may appear surprising. This may partly be explained by the fact that the profession still lags behind other allied health professions of comparable size in terms of overall research capacity and research output (332), though recent years have seen a significant increase in both quality and quantity of radiography research (333). It may also, however, reflect the fact that, given the settings in which radiographers typically work and the relatively ‘biomedical’ character of their interactions with patients, they simply lack appropriate opportunities for health promotion and education enjoyed by the other large AHP groups, in particular physiotherapy and occupational therapy.

⁹ Papers reporting the results of the RCT (393), and describing the training of the radiographers (394), appeared too late for inclusion in this review.

Table 37. Radiography: included studies

Main ref; other refs	Aims (Background)	Methods	Participants; setting	Intervention(s)	HP level; approach; focus	Main outcomes & conclusions	Quality	Notes
(328); (329-331)	To compare the effectiveness & acceptability of 2 versions of an intervention designed to promote awareness of breast cancer among older women & early self-referral to GP. (Women who delay presenting with symptoms of breast cancer have reduced chance of survival. Older women, who are at greater risk, are more likely to delay presenting with the disease.)	Non-randomized trial ("a within-group before-and-after evaluation")	Older women around age 70 with possible symptoms of breast cancer exiting the English NHS Breast Screening Programme; NHS hospital breast cancer screening unit, inner-city south-east London ("one of the most socially deprived areas of the UK").	Pilot study. (1) breast cancer awareness booklet developed by the research team & issued at final routine screening session (n=176); (2) (1) <i>plus</i> reinforcement via a 10-minute face-to-face session with a diagnostic radiographer, showing photos of early symptoms & demonstrating self-examination techniques, reinforcing early referral message (n=116). Focus on increasing self-efficacy, including demonstration, role-modelling, positive feedback & encouragement. Action planning to encourage translation of intention to seek help into actual behaviour.	Secondary HP (main focus); health education, behavioural interventions (approach explicit: self-efficacy); self-esteem/self-efficacy, other (self-referral behaviour).	Measures: change in knowledge of breast cancer symptoms (primary), change in knowledge of risk, confidence to detect a change & likelihood of disclosure to someone close (all measured by study-specific self-report questionnaire). Significant improvements in knowledge in both groups at 1 month: mean number of breast cancer symptoms identified (out of 11) increased from 5.3 by 1 symptom in group (1) & by 1.9 in (2). Improvements sustained at 6 months. Improvements in knowledge of risk of developing breast cancer. No	Weak	Delivery & evaluation led by clinical psychologists. 2 diagnostic radiographers conducted the supplementary interviews & contributed to the development of the booklet & to the evaluation.

					<p>significant increase in level of cancer worry. Neither intervention had any impact on encouraging women to disclose to someone close on discovery of symptoms. Both groups reported increased confidence in ability to detect early symptoms & in self-examination. No adverse effects reported.</p> <p>Challenges: learning structured interviews, delivering complex health messages within time constraints & dealing with unexpected events, e.g. emotional distress.</p> <p>Benefits: enhanced interaction with women & extending role of the radiographer (judged beneficial but demanding: not all radiographers may be motivated or suitable for this</p>		
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						work). Training, ongoing supervision & support essential. Multi-centre trial would require training many professionals. A major challenge to implementing (2) across the NHS Breast Screening Programme would be to ensure consistent quality.		
(97)	To reduce the number of 'unnecessary' referrals for lumbar spine x-rays, by GP and patient education. (High incidence of unnecessary requests for X-rays from patients with back pain)	Before and after study.	People (20-55) referred from primary care with request for lumbar spine X-ray; GP practices, North-West England (mixed urban/rural)	Posters in GP practices informing patients that x-rays are not needed/helpful; self-help back care leaflets distributed via GP practices; feedback to GPs on referral rates.	Secondary HP (not main focus). Health education (approach not explicit); self-management.	Measure: number of referrals for X-rays. Referrals reduced by 54%, though unnecessary referrals remained at c.90% (<5% justified against Royal College of Radiologists guidelines). Effects of leaflet on patient back self-care not evaluated. Action recommended to target GPs continuing to refer unnecessarily.	Moderate	Radiographer & PT involved in development & design of education materials. Design & evaluation led by consultant radiologist, delivery by GPs.

11 Paramedics

11.1 *Profile of the profession*

Paramedics work with patients of all ages and are the senior ambulance service healthcare professionals at an accident or a medical emergency, assessing a patient's condition and providing essential treatment before the patient is transferred to hospital. They are trained to drive what is effectively a mobile emergency clinic and to resuscitate and/or stabilise patients using sophisticated techniques, equipment (such as defibrillators, splints and intravenous drips), oxygen and drugs (334). Paramedics typically work either on their own or as part of a two-person ambulance crew with an emergency care assistant or ambulance technician, and work closely with doctors and nurses in hospital accident and emergency departments, briefing them in the course of patient handover.

However, partly as a result of the unmet need produced by changes in primary care service provision, such as shortages of GPs and their opting out of out-of-hours care, and increasing demand for ambulance services (335), the last few years have seen these services move away from secondary care and forge much closer links with primary care. In addition to working with ambulance trusts, paramedics now commonly practice in the community, such out-of-hours GP providers, minor injuries units and walk-in centres, and in intermediate care, private health, industry and sports settings. They also have frequent contact with patients' relatives and members of the public, as well as with social care and the police and fire services.

The policy document *Taking Healthcare to the Patient* (336) recommended sweeping changes to the way ambulance services operate, including greater use of telephone advice, increased working and improved integration with primary care services, planned patient assessments in the home and a major review of ambulance training, including a move to higher education institutions. The strategy's specific aim was to treat and discharge far more patients in the community and dramatically reduce the number of ambulance transports to emergency departments (335).

As part of this process, the role of the paramedic has shifted from its focus on basic first aid and patient transportation, to include higher levels of patient care and the treatment of a wide range of conditions (337). Many paramedics have undertaken additional training and moved into specialist and advanced practitioner roles. One of these, the emergency care practitioner (ECP), combines extended nursing

and paramedic skills and supports the first contact needs of patients in unscheduled care. ECPs are primarily employed by ambulance service trusts and undertake a range of activities, including carrying out and interpreting diagnostic tests, undertaking basic procedures and assessments of patients with long-term conditions in their homes, and prescribing a wider range of medications (338). Evaluation research suggests that ECP schemes have had a significant positive impact on emergency services' workloads, leading to reductions in referrals to other health professionals and the use of emergency transport, and in associated costs (339).

The Department of Health is also currently considering the introduction of independent prescribing responsibilities for advanced paramedic practitioners (Paramedic Independent Prescribers), and an engagement exercise is due to finish in June 2010 (336,340).

Recognition of the paramedic profession came relatively late, beginning in 2003 with the introduction of statutory registration and the promotion of graduate-level entry (337). The professional body is the College of Paramedics (formerly the British Paramedic Association), which was established as recently as 2001 in response to the admission of paramedics as members of the Council of Professions Supplementary to Medicine (now the HPC) (341). There are around 15,000 HPC-registered paramedics in the UK, over 9,200 of whom are employed by the English NHS (43,49). This figure excludes around 700 managers and 700 emergency care practitioners, most of whom trained as paramedics (339).

11.2 Results from the systematic review

Although the scope of paramedic practice includes health promotion, health education and injury prevention, and paramedic education and training courses now encompass health promotion (341,342), no studies meeting the review's inclusion criteria were found. Given the size of the profession, which is the fourth largest of the AHP groups, this is perhaps surprising, but it is consistent with the severe lack of high quality published research evidence relating to current paramedic practice in general (337).

Just a single brief report of an unevaluated paramedic-led health promotion intervention was found. This concerned a paramedic with Mersey Regional Ambulance Service who launched an awareness campaign ("Don't walk away and let a friend die") to alert young people to the dangers of leaving a friend who has passed out from alcohol abuse on their own in a public place. The campaign began with one poster but was reported to have gone international (343).

12 Orthoptists

12.1 *Profile of the profession*

Orthoptists are concerned with the assessment, diagnosis and treatment of ocular motility defects and problems relating to vision, such as amblyopia (lazy eye), defective binocular vision, abnormal eye movements and diplopia (double vision) (344). They are the recognised experts in childhood vision screening and undertake primary (and sometimes secondary) screening of children aged four and five. Procedures utilised by orthoptists include perimetry (assessment of field of vision), tonometry (measurement of pressure inside the eye), fundus photography (photography of the retina) and biometry (measurement of the length of the eye and curvature of the cornea). They also assess the use of visual aids for partially sighted children and adults, and teach the use of paediatric contact lenses to patients and parents. Their patients are of all ages, but particularly the very young and the elderly, who have a higher incidence of ocular pathology. They include those with special needs, specific learning difficulties, maxillofacial injuries, stroke, cancer, diabetes, cataract, glaucoma, low vision and neurological conditions.

The scope of orthoptic practice has expanded substantially in recent years (345), and the profession has evolved from a purely hospital-based profession to include community clinic practice within PCTs and school-based assessment (346). Orthoptists have traditionally been members of the eyecare team which includes ophthalmologists, optometrists, ophthalmic nurses and others, but they now also work closely with other professionals within the NHS (primary and secondary care), education (such as school nurses), social services, and the voluntary sector on a one-to-one basis and, very frequently, within multi-disciplinary teams.

The professional body for orthoptists is the British and Irish Orthoptic Society (BIOS). It seeks to increase awareness and understanding of binocular vision problems and visual development in both children and adults, and in areas such as low vision, reading difficulties, glaucoma and diabetic screening. It also seeks to encourage health promotion activity among its members, the general community and other professionals within health and education (346).

The profession is a small one and is largely confined to the NHS. There are 1,278 HPC-registered orthoptists, 1,001 of whom (headcount) work within the NHS (43,49), a far higher proportion (78%) than is typical for the AHPs.

12.2 Results from the systematic review

Although orthoptists' scope of practice officially encompasses health promotion (347), and there is a reported national recognition among the profession of the need for health promotion at all levels (346), no studies meeting the review's inclusion criteria were found.

A small number of brief reports of unevaluated health promotion interventions were found. For example:

- A new occlusion clinic based within a Glasgow orthoptic department aimed to promote better attendance and compliance with occlusion (348). A number of health promotion activities were undertaken, including giving parents and children defined goals of 400 hours of occlusion wear; parental education via information leaflets and discussion with clinic orthoptists; information leaflets for school/nursery teachers; a reward system; and a patient/parent wall chart to document occlusion compliance. It was intended to measure a range of outcomes for the 100 patients envisaged to be recruited to the project, but no subsequent evaluation study was found.
- Reports of orthoptists running patch parties or clubs, which offer information, encouragement and a supportive environment (such as opportunities for parental interaction, games and stories) in order to motivate children undergoing treatment for amblyopia who were having difficulties complying with their patching (349,350).

13 Prosthetists and orthotists

13.1 *Profile of the profession*

Prosthetists assess, diagnose and treat patients by designing and fitting the most appropriate artificial replacements for those who have lost or were born without a limb. Orthotists assess, diagnose and treat patients requiring specialist devices (orthoses) or other intervention to overcome difficulties of body movement, control or discomfort resulting from a very wide range of acute, chronic or progressive conditions. Orthoses include splints, braces, callipers, corsets, collars and therapeutic footwear (351). Patient groups include children with congenital and acquired mobility difficulties and adults with acute injuries or long-term conditions.

Orthotists and prosthetists receive referrals from other AHPs, GPs, consultants and via self-referral. Although they frequently work within multidisciplinary teams, many orthotists are lone practitioners providing services over wide areas (351). Technicians and assistants support their clinical work.

Practitioners may specialise in a number of areas, including spinal, paediatrics, diabetes, rheumatology, stroke, head injuries, lower/upper limb and foot and ankle (352). Specialists are often the lead professional within the multidisciplinary environment, with responsibility for directing non-medical treatment. Suitably qualified orthotists and prosthetists are also permitted to undertake extended practitioner roles, including providing complementary therapies, teaching stretching and strengthening exercises and requesting x-rays, although they may not currently take x-rays, carry out invasive procedures or be prescribers or supplementary prescribers of medicines (they may, however, administer medicines under patient group directions).

The professional body is the British Association of Prosthetists and Orthotists (BAPO). The professions are, by some margin, the smallest of all the AHP groups, with only 825 HPC-registered practitioners in the UK (49). About 70% of orthotists are employed by companies contracted to the NHS, with the remainder being employed directly. The proportion of prosthetists directly employed by the NHS is just 2.5%, by far the lowest proportion of any AHP group (351).

13.2 *Results from the systematic review*

Although the scope of practice of prosthetists and orthotists includes the provision of education and advice to patients and other healthcare professionals regarding the choice and use of orthoses and prostheses (352), no studies meeting the review's inclusion criteria were found.

14 Optometrists

14.1 *Profile of the profession*

Optometrists (previously known as ophthalmic opticians) work with patients of all ages. They examine eyes, test sight, give advice on visual problems, and prescribe and dispense spectacles or contact lenses, and also recommend other treatments or visual aids where appropriate. Optometrists are trained to detect defects of sight and recognise signs of eye injury, disease or abnormality and if necessary, refer these conditions to other healthcare professionals for further investigation and treatment. Furthermore, some general health conditions, such as diabetes, and hypertension show themselves in the eye and the optometrist is also trained to detect these. (353).

The majority of optometrists work in private practice, ranging from large chains to smaller independent practices, and most of the rest are employed by the NHS within the hospital eye service. A small number are employed by universities and charities.

Qualified optometrists have the opportunity to develop their interests in specialist aspects of practice such as contact lenses, glaucoma, low vision, paediatric optometry or sports vision. As a result of the Crown Report (354), which recommended that the legal authority to prescribe should be extended to certain non-medical groups, there are now several mechanisms by which an optometrist can prescribe, supply or administer medicines to patients. All registered optometrists are permitted to use various diagnostic drugs, and to use and supply specific therapeutic Prescription-Only Medicines (POMs), and a recent survey indicates that significant numbers of practitioners are regularly using these to manage common non-sight-threatening conditions (355). In addition, optometrists may, after undertaking additional training, engage in Independent Prescribing (introduced in 2008), where they take responsibility for the clinical assessment of the patient, establishing a diagnosis and determining the clinical management required; Supplementary Prescribing (2005), a voluntary partnership between an independent and a supplementary prescriber to implement an agreed patient-specific clinical management plan with the patient's agreement; and Additional Supply Medicines Act exemptions (2005), which permit optometrists to supply or prescribe an additional range of POMs directly to patients (356).

Optometrists are not recognised by the Department of Health as AHPs, though they form an important part of the non-medical health workforce and the profession shares many features with the recognised AHPs in terms of professional training, regulation and status. All optometrists practicing in the UK must be registered with the General Optical Council, the profession's regulatory body. The professional body is the College of Optometrists, and there are a number of professional/trade associations. There are currently around 10,400 registered optometrists in the UK (353), with around 9,900 authorised by PCTs (in England) and Local Health Boards (in Wales) to carry out NHS-funded sight tests (as at the end of 2008) (54).

14.2 Optometrists' role in health promotion

The impact of visual impairment is wide ranging. For example, impaired vision in the elderly has been linked with falls and other accidents (357), with those with low vision being about two times more likely to have falls than fully sighted people (358), prolonged hospitalisation (359), road traffic accidents (360), depression and reduced quality of life (361). Visual impairment also has a significant economic impact: the total direct and indirect cost of partial sight and blindness in the adult population in the UK has been estimated to be in the region of £22 billion in 2008 (362).

High-risk groups with a greater than average risk of vision impairment, including people of lower socio-economic status, black and minority ethnic (BME) groups and the elderly, are often the least likely to access eye care services:

- The relationship between social deprivation and access to eye care services is well established. Late presentation in patients suffering from glaucoma is more common in patients from lower socio-economic groups (363). Similarly, the significant variations in referral rates for cataract surgery correlate well with social deprivation indices and poor use of optometric services in the community (364).
- The burden of eye disease is greater in certain ethnic groups. Age-related cataract is significantly higher in British Asians when compared to Caucasians, with an earlier age of onset (365). People of African-Caribbean descent are eight times more likely to develop glaucoma than the general population and it tends to appear 10-15 years earlier than in other ethnic groups (366). There is considerable evidence that glaucoma in these groups is not detected as early as it could be. Lack of awareness of risk, low levels of referral and under-utilisation of the primary eye care service have all been identified as issues associated with

unnecessary numbers of black people becoming blind because of the disease (367,368).

- Demographic changes together with improvements in healthcare have led to an increasingly elderly population with a longer life expectancy. Cross-sectional surveys of older people have identified a significant amount of undetected ocular disease and potentially treatable visual disability in the community (369,370) and suggest that between 20% and 50% of older people have undetected reduced vision (358). A large proportion of the population have uncorrected refractive errors that would benefit from glasses and visual impairment. As the population ages, the incidence and burden of eye disease is set to increase. For example, glaucoma and age-related macular degeneration (AMD) affect one in ten people over 70 and by 75 a quarter of all people will have developed a cataract (371). Research suggests that a third of people over 70 fail to have regular eye tests (372) and nearly 90% of older people with treatable visual disorders do not avail themselves of eyecare services (370).

Survey research suggests that there are number of barriers to sight testing among these high-risk groups. The main barrier is the perception that they do not need it because "there is nothing wrong with their eyes". The high costs of spectacles are also thought to be a major barrier, particularly among low income groups (372).

Optometrists carry out around 12 million NHS sight tests in England and Wales each year (55), and therefore play a crucial role in the detection of eye disease in the community. For example, virtually all (>90%) glaucoma suspects are identified by optometrists based on opportunistic screening of individuals attending for a routine sight test (373).

These very high levels of patient contact also allow optometrists to play crucial health promotion roles (both eye- and general health-related) in a number of areas. For example, public awareness of the risk of eye diseases associated with smoking, the UK's largest preventable cause of death, is very low, despite the fact that smoking more than doubles the risk of developing Age-related Macular Degeneration (AMD), the leading cause of blindness in people over the age of 55 in the developed world (374). It also increases the risk of many other common potentially blinding ocular conditions, such as cataracts. Optometrists are therefore ideally placed to raise awareness of the risks of smoking in the course of conducting eye tests, and have been encouraged to add smoking history to the history taking for all patients, inform patients who smoke about the potential risk to their eyesight as well as to their general health, offer advice regarding smoking cessation and

signpost local smoking cessation services (375). However, a recent questionnaire survey investigating community optometrists' attitudes and current behaviour regarding provision of smoking cessation advice revealed, however, that very few (around 6%) routinely asked about smoking habits at new patient consultations, and even fewer (around 2%) at follow-up visits (376). Reasons given for not routinely providing smoking cessation advice included a perception that it was not the optometrist's role, lack of time and forgetting to ask. A majority (68%) of respondents did, however, want to improve their knowledge of smoking and visual impairment, and 56% requested further training. The survey authors concluded that there are untapped opportunities to implement brief interventions to promote smoking cessation services in community optometry settings.

Other areas of health promotion include giving nutrition and lifestyle advice to patients with diabetes to prevent diabetic retinopathy, which leads to irreversible sight loss unless treated early. Opportunities also exist for optometrists to raise awareness of diseases such as cancer in the course of almost any patient encounter. In addition to being able to diagnose ocular cancers and metastases to the eye and orbital region, and directly to observe signs of skin cancer, optometrists are in a position to provide cancer information and education as part of their case history and give positive health messages relating to smoking cessation, diet and exercise to reduce cancer risk factors (377).

At the societal level, one of the key strategic priorities of the recently published UK Vision Strategy (378), which aims to develop a unified plan for action on all issues relating to sight loss and eye health, and with which the College of Optometrists and other optometric organisations are involved, is to raise awareness of eye health among the public, particularly those most at risk of eye disease. In partnership with RNIB and other organisations, the College organises an eye health awareness campaign, *National Eye Health Week* (<http://www.visionmatters.org.uk>), which aims, through a range of activities across the UK, to communicate the importance of eye health and calls on the public to get regular eye tests and make lifestyle choices that will protect their sight. It also urges optometrists and others to support the campaign by displaying posters and leaflets in their shops and clinics. The College also maintains an eye health awareness website, *Look After Your Eyes* (<http://www.lookafteryoureyes.org>), which includes information about the eye and eye health, and promotes a number of awareness campaigns.

14.3 Results from the systematic review

Despite the size of the optometric profession, which is comparable to speech and language therapy or podiatry, and its very substantial numbers of contacts with members of the general public, only one study meeting the review's inclusion criteria was found. This may be because a significant number of public health interventions take place informally during optometric consultations but have not been formally evaluated.

One study which evaluated an ocular health promotion intervention, and which reported optometrist involvement, investigated whether a public education campaign targeting Indian residents aged 60 and over in Southall, West London, and utilising television, local press and radio and places of worship, can increase awareness and encourage people to have their eyes tested at a local optometric practice (379).¹⁰ Questionnaire results were promising, and showed a significant increase in the number of people who had heard of glaucoma (from 22% to 53%). Before the campaign, most people had heard about glaucoma from their GP, friend or relative. Post-intervention, the majority (69%) had heard of glaucoma from the radio, which appeared to be the most effective medium for this population. However, although the campaign raised awareness, the study did not demonstrate any changes in health-seeking behaviour.

¹⁰ This study has not been included in the systematic review because optometrists were involved in data collection only.

15 Discussion

15.1 *Strengths and weaknesses*

We acknowledge the limitations of this research. First, the 141 studies that make up this systematic review cannot be treated as an evidence base from which can be 'read off' in any kind of direct or straightforward fashion a set of definitive conclusions regarding the role that AHPs actually play in health promotion. At every stage beginning with health promotion activity, through evaluation, culminating in publication, there operates a series of filters or gates, which mean that the evidence base is almost certainly partial. Judging by the substantial number of reports of (unevaluated) HP activity by AHPs identified in the course of our research but not included in the review, it would appear that health promotion interventions are occurring routinely in everyday AHP practice but are not being evaluated, or evaluated but not submitted for publication, or submitted but not accepted. The problem of partiality is compounded (and confounded) by the existence of marked differences in research capacity between the professions, which mean that the chances of a health promotion intervention being evaluated will vary systematically, as will the chances of that evaluation achieving publishable standard. The studies therefore represent the tip of an iceberg, which merely hints at what lies below the waterline. Nonetheless, in an era of evidence-based practice, we believe that it is important to establish the evidence base for AHP involvement in health promotion, as a first step towards understanding and a guide to further research. Second, although we knew of innovative health promotion practice by AHPs outside the UK, we restricted the review to UK studies for two reasons. One was practicality, since the review was already at the limits of manageability. However, we were also aware of important differences in education, training, professional status, service configuration and the like, which would have called into question the relevance of findings from outside the UK.

Within these limitations, we strove to make the review as comprehensive as we could in two main ways (as described in Chapter 2). First, we set the parameters of our search to be as inclusive as possible. Given the expected heterogeneity of studies in this area, and the wide range of outcome measures of interest, we did not include any terms for study designs or outcome measures in the search strategy. Secondly, because of the diversity of the vocabulary used to refer to HP and HP-related interventions, and

because the review included studies in which HP was not the primary intervention focus and which therefore might not have been indexed using HP-related keywords, we made no attempt to include intervention-specific terms in the search strategy.

This means that, as a search strategy, it was minimally efficient, as is indicated by the ratio of initial 'hits' (after de-duplication) to ultimate inclusions of 318:1. While burdensome, however, this inclusiveness increases our confidence that we have overlooked few eligible studies. Nevertheless, the limitations of the study design mean that our findings must be treated as offering only indirect and partial insights into the *actual* role of AHPs in health promotion. As a consequence, the discussion that follows, and the conclusions and recommendations it generates, are offered as tentative suggestions only, and must be read as such.

Because of the heterogeneity of interventions and study designs that we expected to find, we had planned from the outset to use narrative synthesis to analyse our findings. We had envisaged that this would take the form of an 'evidence profile' for each health promotion intervention (described in 2.10). In the event, the evidence base was not sufficiently complete or robust to support a narrative synthesis in the form intended. Instead of focusing on the outcomes of health promotion, therefore, the narrative synthesis that follows focuses on the process. Thus, we report on patterns and styles of AHP working, relationships with other professions, health promotion priorities (types of conditions, target subjects), settings and levels of interventions, approaches to health promotion and research.

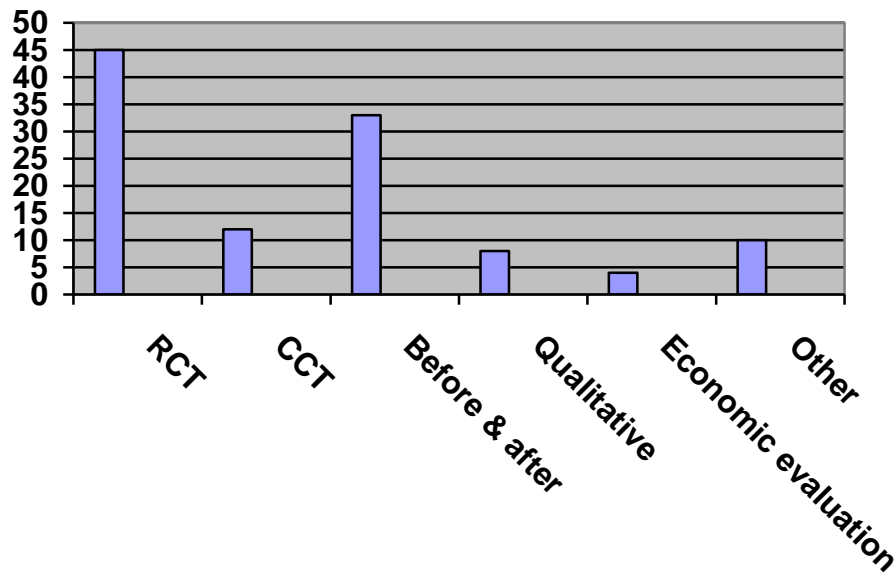
15.2 *The studies*

We identified 141 eligible studies, of design types shown in Figure 7. (*NB*: in several of the Figures that follow, proportions may sum to more than 100%. Where this occurs, it is the consequence of multiple responses being available.) *Randomised Controlled Trials* (45%) and *Controlled Clinical Trials* (12%) accounted for half, with *Before & after* studies making up a further 33%. Qualitative studies (10%) were the next largest category. Economic evaluations (5%) were uncommon. Other designs accounted for the final 10% of studies.

112 studies were submitted to overall quality assessment. As recommended by CHPPHF (63), for quantitative studies we used the Quality Assessment Tool for Quantitative Studies (69), which assesses both internal validity (methodological quality and bias) and external validity (generalisability). For qualitative designs we employed the CASP appraisal tool for Qualitative Research developed

by the Public Health Resource Unit, which assesses rigour, credibility and relevance (70).

Figure 7. Studies by design type (%)



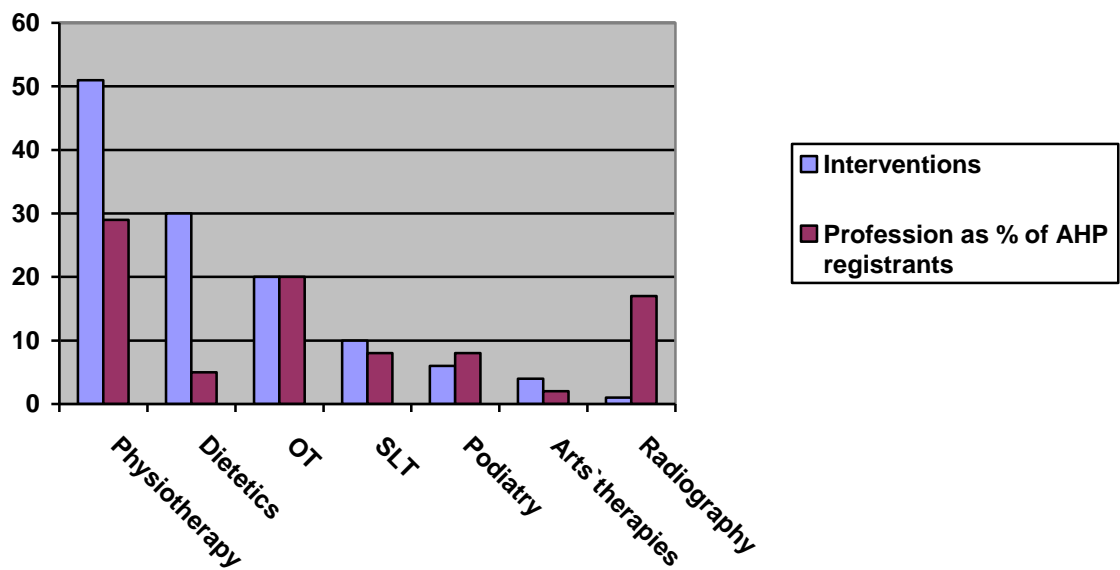
Although different assessment tools were used, there was no statistical difference in quality assessment outcomes between the two categories of study design. 13 of the 112 studies evaluated for methodological quality (12%) were assessed as being Strong, 33% as Moderate and 55% as Weak. Such a quality profile is not surprising, given the widely acknowledged difficulties of researching health promotion. These include multi-component interventions, diverse (and difficult-to-access) study populations, multiple (and difficult-to-define) outcomes, problems of recruitment and attrition, and the effect of context on intervention design, implementation and effectiveness (64). It is also comparable with the findings of a recent Cochrane review of the literature (albeit restricted to RCTs) on exercise to improve self-esteem in children and young people (380).

15.3 Patterns of AHP working

Figure 8 (below) shows the pattern of AHP involvement in the interventions we identified, with physiotherapists leading the way with just over half (51%), followed by dietitians (30%), occupational therapists (20%), speech and language therapists (10%), podiatrists (6%), arts therapists (4%) and radiographers (1%). In the main, this distribution approximates reasonably closely to the professions' relative sizes, but there are a number of points where the two diverge. Thus, occupational therapists, speech and language therapists, podiatrists and arts therapists are represented roughly

proportionally, while physiotherapists and dietitians appear to be over-represented, and radiographers to be under-represented. AHPs played a variety of roles (percentages sum to more than 100, because of multiple roles). In 88% of interventions they lead delivery, interacting directly with the study population. In 60% they were responsible for planning and developing the intervention, and in 57% they were responsible for evaluating it. Other roles included training the intervention deliverers (6%), and advice (5%). In just over two-thirds of interventions (69%), AHPs were identified as the lead profession.

Figure 8. Interventions by profession (%) and professions as % of AHP registrants



As Figure 9 (below) reveals, in 47% of interventions AHPs were the only profession(s) involved. 26% of interventions involved doctors (with hospital doctors 20% and GPs 6%), 23% involved nurses, and 12% psychologists. Others (20%) included social workers and teachers (4% each), residential workers (1%) and community workers (1%). The predominance of medicine and nursing is unsurprising and is consistent with the dominance of clinical settings. The high profile of psychologists, however, is noteworthy. It is quite out of scale with their numbers in the health workforce, but it undoubtedly reflects the importance of CBT-type interventions targeting behavioural or attitudinal change, and self-efficacy. Given AHPs' emphasis on cross-sectoral and inter-professional working, the low level of involvement of non-clinical professions is something of a surprise.

Figure 9. Interventions by other professions involved (%)

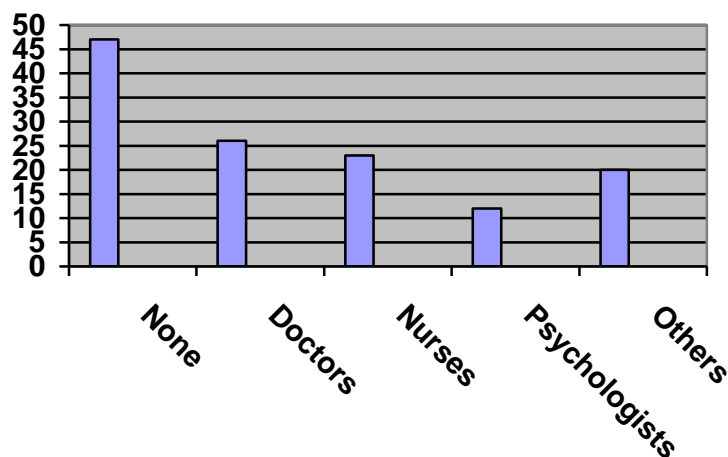
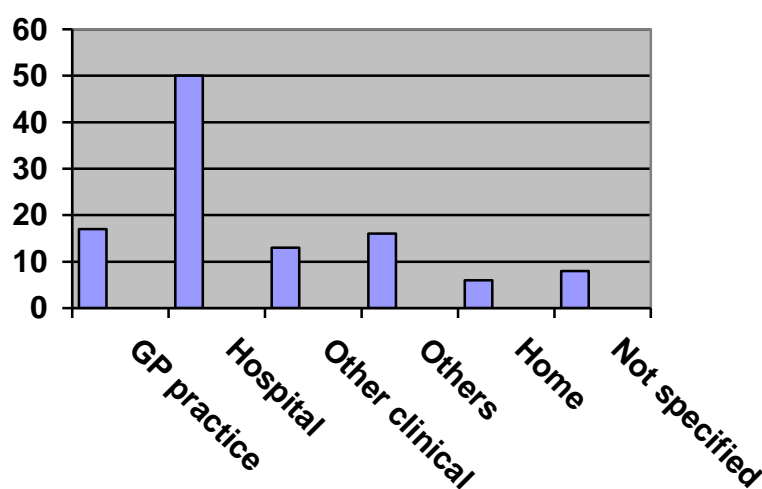


Figure 10 (below) displays the settings for these interventions. Hospitals (50%) lead the way, followed by GP practices/primary care (17%), community sites (11%) and homes (6%). Other settings (16%) included hospices (1%) and School/college (2%). Just three interventions (2%) took place in a residential/nursing home. Once again, given the diversity of settings in which AHPs practise, and the extent of their working across sectoral boundaries, the paucity of interventions in non-health settings is noteworthy. It is, however, impossible to determine whether the predominance of hospitals reflects a genuine concentration of health promotion activity there or of research expertise, or simply a preponderance of employment. Most probably it is a combination of all three.

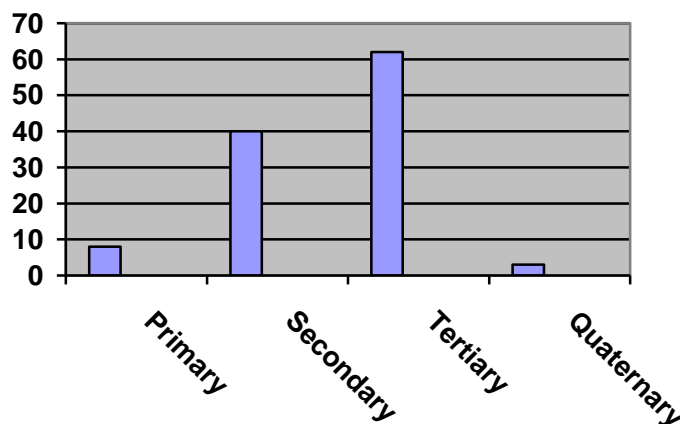
Figure 10. Interventions by setting (%)



15.4 Style of working

Figure 11 below shows the levels of the health promotion interventions. The majority (62%) were at the level of *Tertiary HP* (promoting the health of those with chronic conditions or a disability to enhance quality of life and potential for healthy living). *Secondary HP* (promoting the health of individuals or groups where health damaging behaviour has already occurred, to change behaviour and prevent health moving to a chronic or irreversible stage) followed with 40%, and then *Quaternary HP* (promoting the emotional, social and physical health and wellbeing of the terminally ill) with 3%. We found relatively few interventions (8%) which were concerned with Primary health promotion – the prevention of ill health among healthy individuals. The predominance of Secondary and Tertiary undoubtedly reflects the traditional role of AHPs as second-line therapists, dealing with patients who have been referred to them by other clinicians, who have already diagnosed an existing condition. As AHPs increasingly adopt the role of first-contact carer, so the opportunities for primary health promotion can be expected to increase correspondingly. This raises questions about AHP education and training, and specifically about their awareness of and preparedness for this dimension of health promotion.

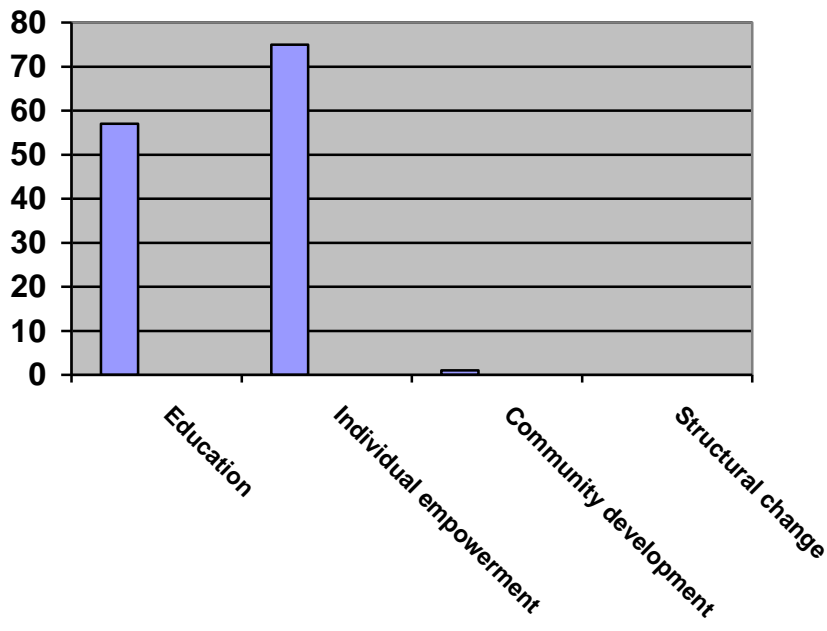
Figure 11. Interventions by health promotion level(s) (%)



Interventions were also overwhelmingly targeted at individual patients. This impression is corroborated by Figure 12, Figure 13 and Figure 14 below (In all three cases, percentages may sum to more than 100, because of multiple responses). The dominant approach (Figure 12) was Behavioral/individual empowerment (75%), followed by Education/provision of information (57%). It is true that a handful of interventions within these categories targeted informal carers alongside patients (or a parent in the case of a child), but interventions that adopted a 'whole family' approach were rare,

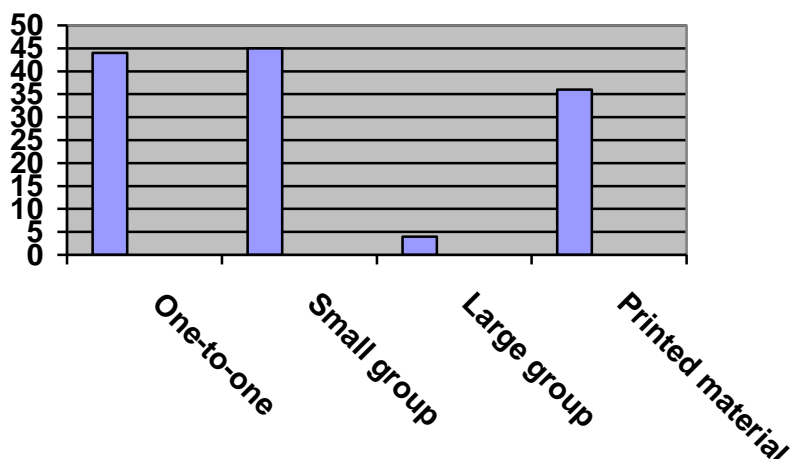
and community level interventions (1%) were also uncommon. The fact that no interventions sought structural change will come as a disappointment to those who argue for the need to target the social and environmental barriers to good health, particularly inequalities in health (8). Overall, these findings confirm that, at least as far as AHPs are concerned, the individualistic approach to public health remains the dominant discourse (24).

Figure 12. Interventions by health promotion approach(es) (%)



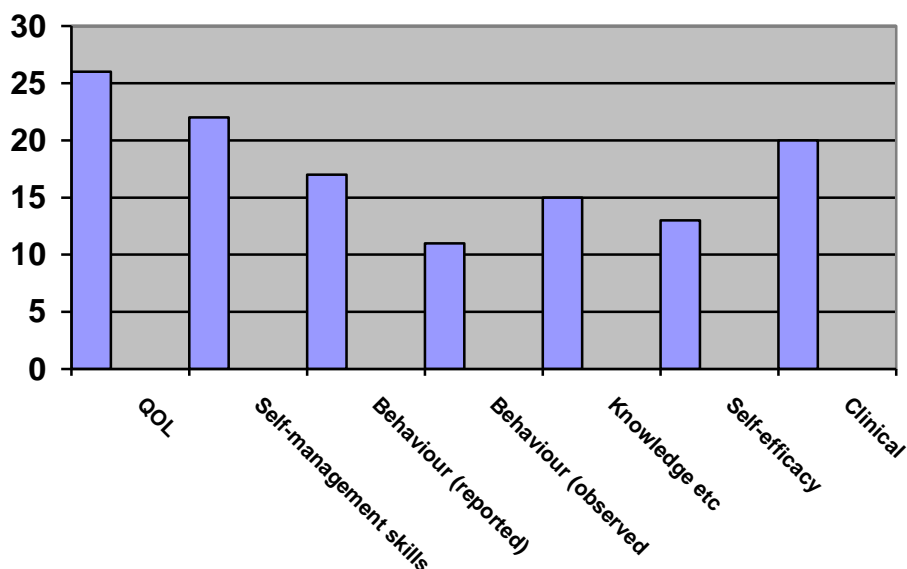
This individualistic focus is reinforced by the media used for delivery (Figure 13). Even though small group interventions (just) outweighed one-to one delivery of education/information (at 45% vs. 44%), in almost every instance, group working was adopted for reasons of administrative convenience and/or cost-effectiveness. In only a handful of studies was group membership conceptualised as a constituent element of the intervention in its own right (as a means of combating social isolation or fostering social integration, for instance). Of the media that were not face-to-face, by far the most common involved the handing out of printed material. Use of other media was rare; the telephone was utilised in only 3% of interventions, and Video/DVD in 6%. In terms of their use of technology, AHPs appear to be less than adventurous (although it is just possible that this might be conditioned by the nature of the groups and individuals they were targeting).

Figure 13. Interventions by delivery medium (%)



Outcomes (shown in Figure 14) were also reported exclusively at the level of the individual. Even where a 'whole family' approach had been adopted, outcomes from family members beyond the index individual were not reported on systematically. Quality of life was the most common outcome (26%) followed by Self-management skills (22%) and Clinical outcomes (20%). Then came Knowledge/awareness/attitudes (15%), with Behaviour (reported) at 17% and Behaviour (observed) at 11%, and Self efficacy/esteem at 13%.

Figure 14. Interventions by selected primary outcome(s) (%)



If we put quality of life and clinical outcomes to one side, almost two thirds of interventions identified some form of behavioural or

cognitive change as a primary outcome. At first sight, this might appear to be in line with the emphasis on social marketing and other behavioural change approaches that has characterised recent policy pronouncements, which espouse the principles of empowering and supporting individuals in making healthy choices and of fostering environments in which such choices are easier (14).

However, *Choosing Health* acknowledges that, in order to affect health outcomes, messages need to be not just given, but “received, believed, understood and acted on” (14). While we found abundant evidence of messages being *given*, the papers we reviewed supplied only patchy evidence that they were being received, believed and acted on. Few studies, for instance, validated the content of the information or advice that was being given, or provided independent measures of the integrity of the intervention or its consistency or of compliance with it. By and large, these seemed to be merely assumed. Where interventions included both a therapeutic and a health promotion component, standard practice would be to describe the former at length and in detail, but the latter only briefly and sketchily. The best studies identified a specific social cognition model of behavioural change, such as the Theory of Planned Behaviour (26) or the Transtheoretical Model (27), but these were few and far between. In the main, interventions appeared to be theorised poorly (if at all). The fact that 10% of interventions involved some kind of partnership with psychologists is encouraging, but it needs to be set against the near universality of information giving and individual empowerment. We cannot rule out the possibility that these lacunae are stylistic artefacts, reporting conventions imposed by the journals where papers were published. However, to our minds they raise questions about the theoretical underpinning of much of this health promotion effort and the sophistication of AHPs’ understanding of it. This would call into question their capacity to respond to calls for social marketing and other behavioural change approaches to be adopted throughout health delivery systems (28).

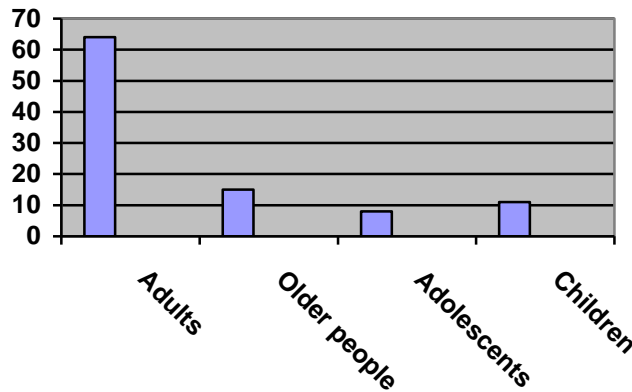
15.5 Health promotion priorities

In terms of age groups (Figure 15), the overwhelming majority (64%) of interventions targeted adults, followed by older people (15%), children (11%) and adolescents (8%).

84% of interventions targeted both males and females, 9% just females and just 2% males (the remainder failed to specify). Of the other demographic or lifestyle variables that might be expected to influence message or advice giving, only ethnicity was referred to, and then by only two studies (<1%). Indeed, ethnicity was a ground for exclusion (non-availability of minority language-speaking staff)

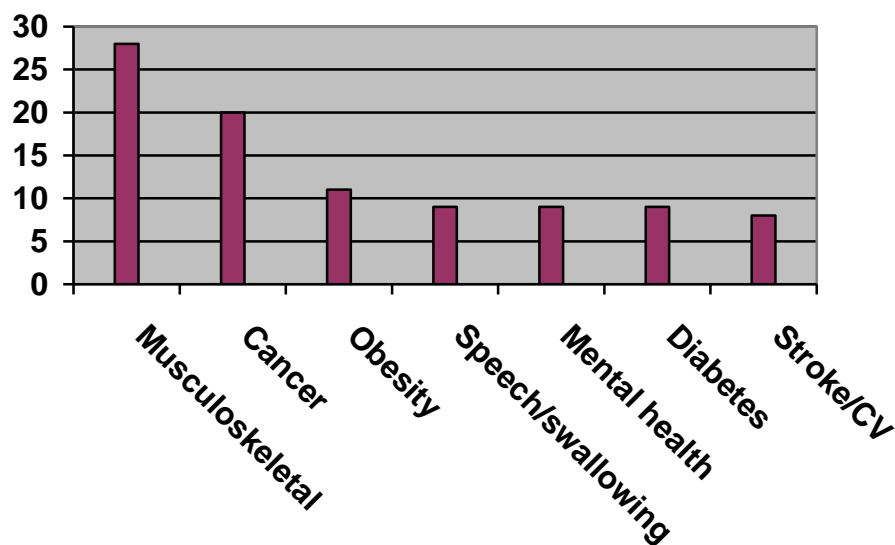
more often than it was a ground for specific targeting. Otherwise, interventions were blind to social class, religion and sexuality, to the extent that these were seldom mentioned even in descriptions of intervention settings.

Figure 15. Interventions by age group (%)



In keeping with the near-complete monopoly of secondary and tertiary health promotion noted above, almost all of these people (89%) had a pre-existing condition. The major conditions targeted are shown in Figure 16. Musculoskeletal conditions (28%) predominated, followed closely by cancers (20%). Some distance behind these two came obesity (11%), diabetes (10%), speech/language/swallowing disorders and mental health (both 9%) and stroke/cardiovascular (8%).

Figure 16. Interventions by condition targeted (%)



Overall, these priorities correspond reasonably well to the thrust of recent policy documents. These emphasise coronary heart disease, cancer, sexual health and mental health problems (14-16), while policy relating to older people has 'become increasingly concerned with the promotion of health and 'active ageing' (17). Little significance attaches to the apparent predominance of musculoskeletal conditions. This is undoubtedly a reflection, not of overwhelming health promotion activity in this area, but of the numbers of physiotherapists and their research capacity relative to the other professions.

15.6 AHPs and research

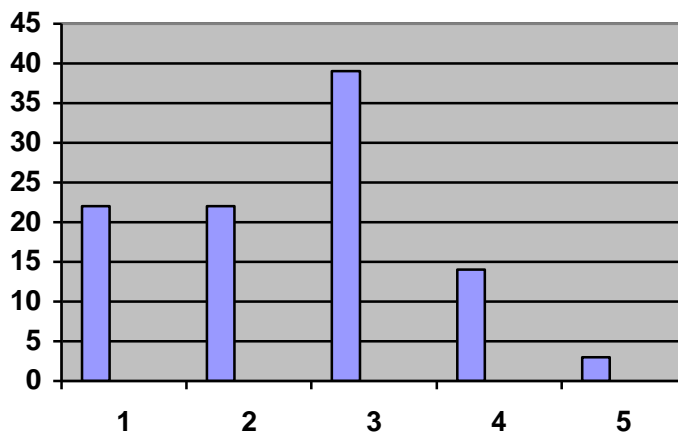
At a number of points, we have had cause to mention research activity and research capacity as significant intervening variables in the production of the evidence base we have been considering. Because of this, it seems worthwhile to include a brief consideration of the present state of play in the development of AHP research capacity.

The benefits of research capacity building have long been recognised, in terms of strengthening practitioner expertise, advancing knowledge, demonstrating the effectiveness of interventions, and supporting evidence-based practice and policy making (e.g. (381,382)). More specifically, involvement in developing and applying best available research for evidence-based practice has been identified as one of the ten key roles for AHPs (52). At the same time, the barriers that constrain the development of research capacity among AHPs are also well rehearsed. These include lack of funding, the absence of a track record in research, and cultural barriers, lack of leadership, strategy or direction, and lack of research mindedness ((383), cited in (384)).

AHPs are not the only group of professions that has had to struggle to overcome these barriers, but they have had to do so under a set of circumstances that mark them out from, say, nursing and midwifery. First, as Pickstone *et al.* (382) have observed, they are a highly disparate group of professions, who may share some common characteristics, but are otherwise quite heterogeneous. This review has confirmed this observation in respect of their research activity also. Second, they work (often in small groups) in a wide variety of settings, delivering interventions that are complex and multidisciplinary, targeting population groups that are difficult to access and work with, with outcomes that are difficult to measure, rather than narrowly biological or functional. These findings, too, have been confirmed by the present review.

The process of research capacity building is complicated by a set of other circumstances that are best summed up as *lack of critical mass*. We are referring here not just to the headline numerical (WTE) disparity – 50,070 AHPs vs. 321,537 nurses and 114,470 doctors (29). This problem is compounded by the fragmentation that results from the existence of multiple professional representation at national level and the reduction in political influence that this helps to produce. The problem of critical mass is further compounded by the random manner in which the AHPs are distributed across Higher Education Institutions (HEIs). As Figure 17 (below) shows, 70% of HEIs contain three or fewer Allied Health Professions. What the figure does not show is that there is little (if any) regularity to this distribution. Physiotherapy and occupational therapy tend to be co-located, but even this is far from universal. More often than not, co-location is an outcome of historical chance and accident, with little (if any) commonality among the professions that are collocated.

Figure 17. Allied Health Professions by HEI (England only)



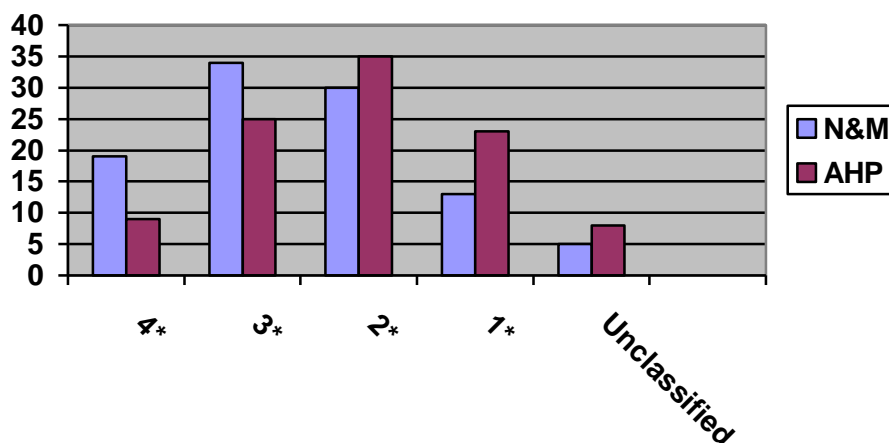
Despite these difficulties, the results of the most recent Research Assessment Exercise provide evidence of progress in AHP research capacity building. Once again, it would not be appropriate to treat the RAE results as neutral and authoritative data on research activity per se.

Nevertheless, the comparison with nursing and midwifery is instructive. In its commentary, the Nursing and Midwifery Sub-panel reported finding “a transformation in strategy, performance and output quality, evident in many of the submissions since 2001”. Although there was still unevenness in the submissions they received, there was also evidence of maturation. In particular, they drew attention to greater *selectivity*, both in the number of submissions and also in the numbers of staff being submitted as research active. Out of 80 eligible units, 35 submitted in 2008,

compared with 43 in 2001. The numbers of individuals submitted was also reduced. By contrast, the AHP Sub-panel reported that the number of submissions it had received had increased by comparison with 2001 (68 as against 50), as had the number of staff submitted as research active (up by 40% over 2001). Specific areas such as biomedical science, nutrition and optometry were singled out for special mention, but overall the panel reported a "very wide distribution of quality," and submissions that were "heterogeneous in both substantive and methodological terms." They also commented on "a lack of strategic focus, with often disparate research groupings." If nursing and midwifery research was maturing, AHP research by contrast appears to have been undergoing a teenage growth spurt.

The difference between AHP and Nursing and Midwifery research is revealed in Figure 18 below. Whereas just over half of Nursing and Midwifery research (53%) was of 3* standard or above, only one third (34%) of AHP research attained this level. Indeed, in this regard, AHPs were by some distance the lowest ranked of all of the disciplines submitted to the Clinical Sciences panel (the average was 60%).

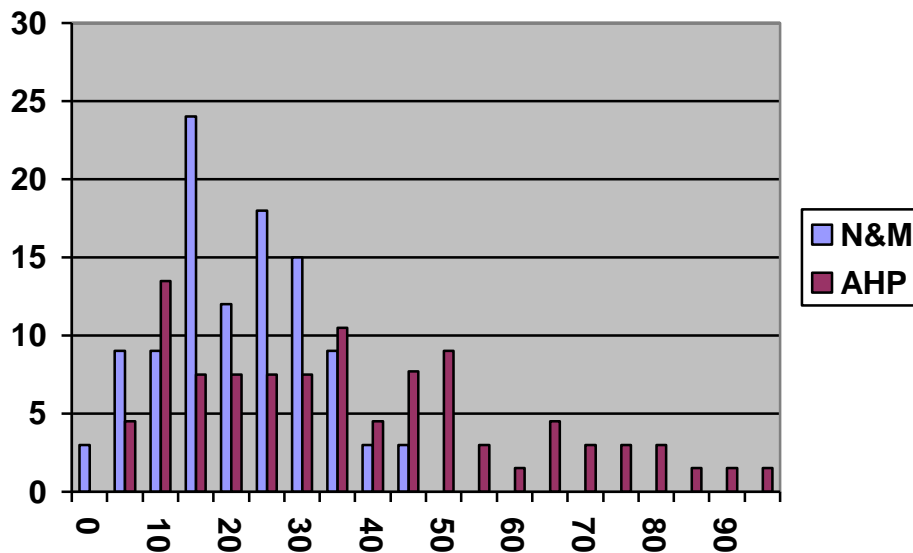
Figure 18. Quality level by activity (staff-adjusted mean) (%)



By focusing on the percentage of outputs in each submission that were rated below international quality, Figure 19 'unpacks' the overall quality of submissions and reveals in greater detail what we believe is the major difference between the Nursing and Midwifery and the AHP returns to RAE 2008. It shows clearly the long negative tail of the AHP submissions, with a median value of 35% of outputs rated below international quality, and 33% of submissions containing half or over half of outputs rated as below international quality. By contrast, for Nursing & Midwifery the median value was 15% and no Nursing & Midwifery submission contained more than 45% of outputs

below international quality. While demonstrating the current relative underdevelopment of AHP research, it may also indicate latent capacity and potential for future development. Realising that potential, however, is likely to be difficult, given the structural and other weaknesses that we discussed above, and in the absence of a national strategy for developing AHP research.

Figure 19. Submissions (%) by outputs rated below international quality (%)



15.7 "Speaking in prose"?

Good heavens! For more than forty years I have been speaking prose without knowing it.

(Moliere, *Le Bourgeois Gentilhomme*, Act 2, Scene 4.)

Throughout this review we have been confronted with the constant struggle to draw a consistent and conceptually coherent dividing line that would serve to differentiate AHP health promotion from 'standard' AHP clinical practice. This presented itself at the search design stage, when we sought an operationalisable definition of health promotion, the abstract review stage, when we tried to determine whether an intervention was or was not health promotion, and at the final stage of deciding whether it was or was not a main focus. In the light of this unresolved difficulty, it is perhaps worth reflecting briefly on the implications of AHP practice for the way we conceptualise health promotion.

For at least two decades, it has become commonplace to observe that the near-universal advocacy and adoption of the term health

promotion has been accompanied by increasing diversity of definitions. As Duncan and Gold (385) put it:

In many cases health promotion seems to have become an all-inclusive umbrella term under which any health service may find coverage. Health services have become health promotion services; outpatient clinics have become health-promotion centers. In these cases, "health promotion" has become a fad or a gimmick--as meaningless as labelling certain cereals and other foods as "natural." Others use health promotion as an umbrella term but of more limited scope. Perhaps the most popular of these is Green's definition of health promotion as, "any combination of educational, organizational, economic and environmental supports for behavior conducive to health."

(p.47)

As Duncan and Gold imply, while some commentators have welcomed this 'mainstreaming' of health promotion as recognition of its importance, others have perceived it as a dilution of its essence, and a threat to its continued existence. As their common ground has shrunk away, it is as if the various schools of thought that health promotion has evolved into have said, "We may not be able to agree on what health promotion is, but what we can agree on is what it is not." As Tones and Green (386) put it

The history of health promotion has been marked by a struggle to distance itself from the medical model that has dominated twentieth-century discourse on health and illness.

(pp.19-20)

As a consequence, it seems to us that health promotion has got itself locked into an absolutist discourse whose terms were set initially in the 1980s or even earlier and which has become increasingly out of step with clinical practice.¹¹

In one of the seminal health promotion texts, McKeown (387) recites the 'founding myth' of health promotion, quoting Dubos (388) (p.109):

The myths of Hygeia and Asclepius symbolise the never-ending oscillation between two different points of view in medicine. For the worshippers of Hygeia, health is the natural order of things, a positive attribute to which men are entitled if they govern their lives wisely. According to them, the most important function of medicine is to discover and teach the natural laws which will ensure a man a healthy mind in a healthy body. More sceptical, or wiser in the ways of the world, the followers of Asclepius believe that the chief role of the physician is to treat disease, to restore health by correcting any imperfections caused by the accidents of birth or life.

(p.1)

Figure 20 below presents (on the left) the key features of health promotion, as defined by the Ottawa Declaration and (usually by

¹¹ These reflections were written in Greece (Summer 2010). This accounts for their classical overtones.

implication rather than explicitly) the features of the alternative to it. It is worth noting that the Ottawa Declaration does not specify what this alternative is. The closest it comes to doing so, is a reference to 'clinical and curative services.' This emphasis on cure is, we believe, significant.

Figure 20. Asclepius and Hygeia

	ASCLEPIUS	HYGEIA
	BIOMEDICINE	HEALTH PROMOTION
<i>Patient-professional relationship</i>	Patient disempowered ("Done to")	Patient empowered ("Done by")
<i>Focus</i>	Individual patient	Individuals, families & communities
<i>Locus of provision</i>	Clinic	Home, community, society
<i>Purpose</i>	Curative	Preventive
<i>By means of</i>	Treatment	Lifestyle change
<i>Service timeframe</i>	Acute, episodic	Lifelong
<i>Nature of service</i>	Disease-focused	Holistic
<i>Aim of service</i>	Cure (Restoration of full functioning)	Achievement of full potential
<i>Key resource</i>	Clinical	Sociopolitical
<i>Orientation</i>	Consequences of ill health ("Downstream")	Causes of ill health ("Upstream")

Since then, we suggest that have witnessed the emergence of newer paradigm, which advocates of health promotion have not fully engaged with – that of chronic illness care. The key features of this new paradigm are:

- a. Self-management support
 - o Patient education
 - o Psychosocial support
 - o Self-management resources
 - o Collaborative decision making
- b. Community resources
- c. For categories of patient
- d. For community

Its aim is no longer to cure or restore full functioning, but to maximise well-being within the constraints of the condition. In the same way that biomedicine and health promotion have been personified as Asklepios and Hygeia, we wish to propose a new member of the Greek Pantheon to serve alongside them as the embodiment this new paradigm. She is Mētis (Μήτις), first great spouse of Zeus and mother of Athena, who, by the era of Greek philosophy, had come to symbolise wisdom, wise counsel and planning. She, and the key features of the model she represents, are presented in Figure 21 below.

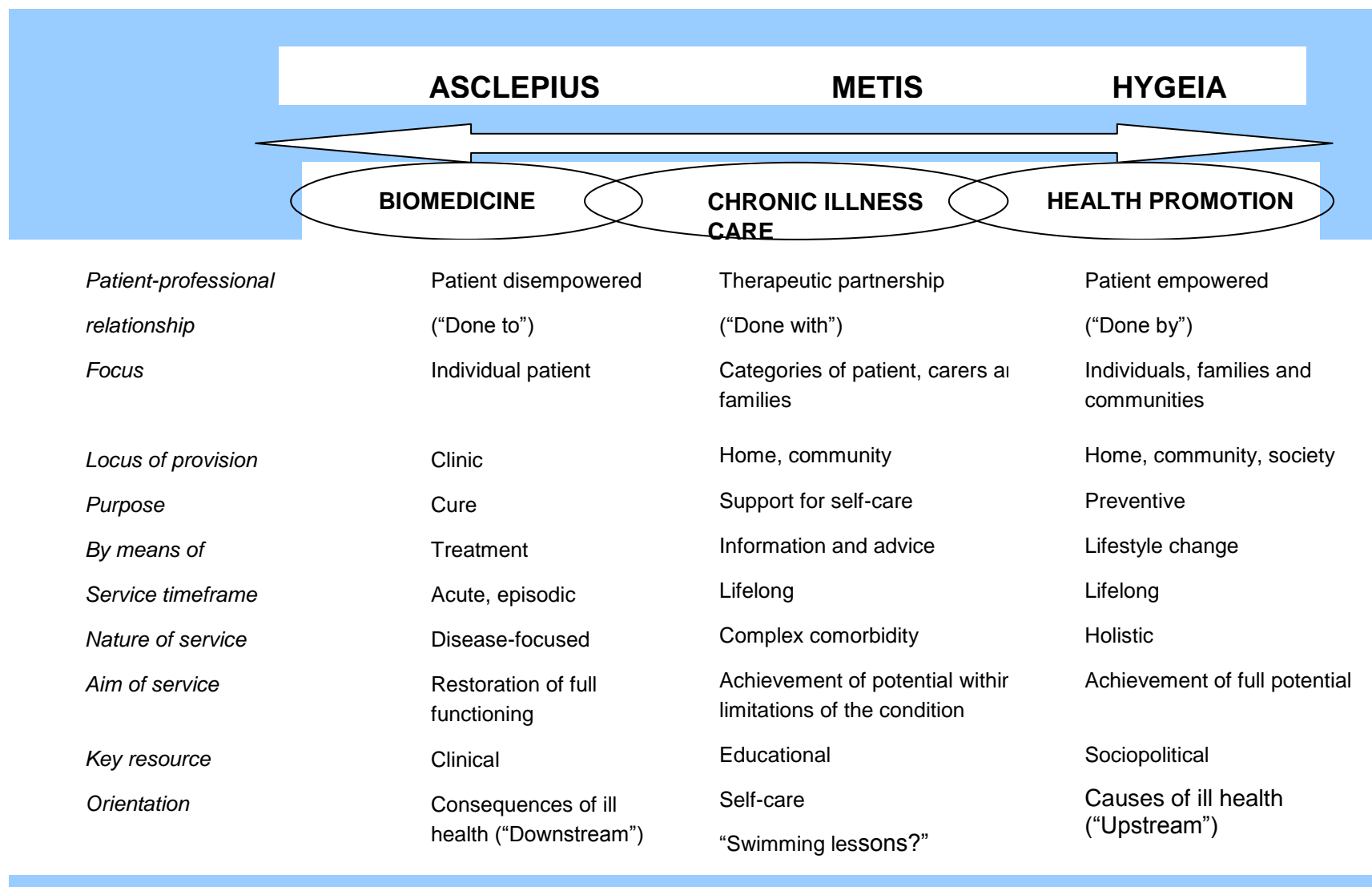
In some respects this new paradigm represents both a continuation of the old medical model and a development of it. For instance, it remains focused on disease, but recognises the increasing significance of complex and multiple comorbidity, and is consequently more holistic. It remains focused on the individual patient, but at the same time increasingly acknowledges the need for care pathways and policies that address the needs of categories of patients and resources to enable their support in the community (389). In other respects, however, it represents a challenge to it. It also poses a challenge to health promotion, by virtue of annexing and incorporating some of its hitherto distinguishing features, such as its reliance on education, its support for self-care, and its emphasis on categories of patients (as opposed to single patients) and resources for the community. In yet further respects, such as empowerment-disempowerment, it occupies a position midway between biomedicine and health promotion, and overlapping them both in key respects. Thus, as far as the index condition is concerned (diabetes, for example, or chronic heart disease) the purpose of care is control and the slowing of progression. However, it is preventive as far as potential complications are concerned. The approach relies on a mix of treatment, support for self care, information and advice and lifestyle change, stepping up or down as circumstances require. Accordingly, treatment will be initiated or intensified in order to re-

stabilise the patient following a crisis and then reduced to enable the resumption of self care. Similarly, service delivery takes place in multiple locations, ranging from the clinic to the home and the community, as circumstances dictate.

How are we to account for the persistence of the Asclepius-Hygeia dichotomy, despite what we see as its increasing disconnection from the reality it purports to represent? We suggest that it needs to be understood in the context of the continuing medical domination of both public health discourse and of clinical practice. First, as Hunter, Marks and Smith (57) have argued, it needs to be viewed against the backdrop of the ongoing struggle of the (medically dominated) public health profession to differentiate itself from clinical medicine, while simultaneously asserting its claim to parity (at least) of professional status with them. Maintenance of traditional dichotomous thinking can be seen to have functioned as an invaluable means of furthering this interest and legitimising these claims. Second, it reflects the continuation of traditional medical domination of clinical practice (despite the changes we have identified), in that, by and large, ongoing responsibility for health promotion has been delegated by doctors to other (lower status) health professionals. Although most (if not all) chronic disease models pay lip service to the principles of multiprofessional team working and preventive care, in practice doctors have continued to be *primus inter pares*, with limited routine involvement in HP. While retaining overall responsibility for the care of the patient, their hands-on involvement continues to be episodic and curative, occurring typically when there has been a crisis of some sort or a failure of CDM, which temporarily redefines the chronic condition as an acute one.

If we redefine health promotion along the lines we have suggested, we believe that it can be seen to be virtually synonymous with much of AHPs' normal clinical practice, as confirmed by this systematic review. We found abundant evidence of information and advice giving and of support for self-care. In the best studies these interventions were carefully theorised and scrupulously planned and delivered. Elsewhere, possibly precisely because they were a taken-for-granted component of standard clinical practice, their significance was not fully recognised and they received less care and attention than they merited. If we are correct, then the answer to the question "What is the role of AHPs in health promotion?" may be that, like Moliere's M. , they are already doing it. The best of them understand this and do it well. Others need to recognise it for what it is in order to do it better.

Figure 21. Asclepius, Metis and Hygeia



15.8 Conclusions and recommendations

As we have already acknowledged, the limitations of this research mean that our findings must be regarded as a partial and unreliable guide to actual AHP practice in health promotion. This means that the conclusions and recommendations that follow remain tentative.

The review provides further confirmation of the heterogeneity of the AHPs. Not only do they differ in terms of their research capacity, with physiotherapy and dietetics over- and radiography under-represented. Differences in the distribution of study types also hint at significant differences in research methodology between professions, with the biomedical paradigm predominating in dietetics, contrasting with the more social scientific orientation of OT. Their heterogeneity complicates the task of drawing conclusions and making recommendations. Further complications arise from the fragmented nature of the AHP workforce, with national leadership distributed across more than a dozen professional bodies, which vary widely in terms of their resources, power and influence. This fragmentation is compounded by their random distribution across HEIs. These factors not only militate against the formation of a national strategy for the development of AHP research. They also make it difficult to generate specific and targeted recommendations. While the major responsibility must lie with the individual professional bodies and their HEI partners, we believe an important role can also be played by pan-AHP organisations such as the Allied Health Professions Federation and the Research Forum for AHPs.

We found evidence of health promotion activity by AHPs in a variety of settings, employing a range of health promotion interventions, targeting a variety of groups, populations and conditions. This encouraging finding is tempered by a number of caveats, however.

The overall quality of the papers we reviewed was weak, with only 13 (12%) of the 112 studies evaluated for methodological quality being assessed as 'Strong'. Such papers tended to be characterised by greater conceptual clarity, more robust data collection systems, and more theoretically driven questions. This quality profile may reflect the widely recognised difficulties of evaluating health promotion, but we believe that there is still room for improvement. In particular, although the majority of health promotion interventions relied heavily on information giving, few studies explicitly incorporated a specific social cognition model of behavioural change. This meant that, by and large, theorisation was weak (at best), resulting in interventions that were designed poorly, delivered unsystematically and evaluated weakly. At present, especially through the medium of information giving, HP appears to be a standard, but largely taken-for-granted, component of everyday AHP clinical practice. If HP is to be meaningful, greater attention needs to be paid to its conceptualisation and evaluation. Re-defining HP as a *complex intervention* could be a helpful

first step towards more rigorous thinking about intervention design, delivery and evaluation. This would require AHPs to focus their attention on the core features of the recent MRC guidance on the development, evaluation and implementation of complex interventions (395). These are: good theoretical understanding of how an intervention causes change, so that weak links in the causal chain can be identified and strengthened; attention to process evaluation in order to detect implementation problems; tailoring of the intervention to ensure a good 'fit' with the local setting; co-development of intervention and evaluation. We believe that adoption of these principles would precisely target many of the weaknesses of intervention design, delivery and evaluation that characterised the literature we reviewed.

This is of particular importance if AHPs are to respond effectively to policy calls urging the adoption of social marketing and other behavioural change approaches. These findings have clear implications for AHP education and training.

15.8.1 Recommendation

In partnership with HEIs, professional (and other relevant) bodies should review curricula both pre- and post-registration to ensure that they deal adequately with the theoretical underpinnings and the evaluation of health promotion.

We also found evidence that the theoretical underpinnings of health promotion could be strengthened via appropriate partnership with other professions. Inter-professional working with health psychologists appeared to be particularly beneficial in this regard, but we believe that it needs to be developed more widely than the 10% level where it stands currently.

15.8.2 Recommendation

Professional (and other relevant) bodies should promote the potential benefits of partnership with health psychologists for enhancing the effectiveness of health promotion.

Our finding that the overwhelming majority of health promotion interventions were at the level of either Secondary or Tertiary levels is hardly surprising, given that, traditionally, the majority of patients treated by AHPs have been referred to them. Historically, therefore, they have had relatively few opportunities to engage in Primary HP, i.e. maintaining health and preventing ill-health and health damaging behavior within the general population. However, as AHPs take advantage of flexibilities permitting them to become first-contact carers, opportunities to engage in primary health promotion can be expected to increase. Their education and training will need to be adapted if they are to acquire the skills and knowledge they will need to fulfill this role.

15.8.3 Recommendation

Professional (and other relevant) bodies should review curricula (especially post-registration) to ensure that AHPs in first-contact care roles are equipped with the skills and knowledge necessary to deliver effective Primary health promotion.

Our findings also confirm the overwhelming preponderance of *individualised* approaches (education and empowerment) over community development. This finding is also unsurprising, given the traditional dominance of individualism in public health discourse, and the more recent policy focus on social marketing and other behavioural change approaches. Nevertheless, we were struck by the virtually complete absence from the literature of any evidence of community-level HP interventions, or of partnerships with non-health agencies and occupations. They suggest that AHPs working in the community may be failing to translate *location in* the community into effective *engagement with* the community, so failing to realise potential resources and opportunities for community-level health promotion.

15.8.4 Recommendation

Professional (and other relevant) bodies should review curricula (especially post-registration) to ensure that AHPs working in community settings are equipped with the skills and knowledge necessary to deliver effective community-level health promotion.

Although the interventions we identified targeted a variety of subjects and conditions, we were surprised by the extent to which AHP HP practice appeared to be blind to fundamental demographic or lifestyle variables, such as social class, ethnicity, religion or sexuality, that might be expected to be relevant to information or advice giving. Only rarely were these variables even referred to in descriptions of study settings. Indeed, ethnicity (in the form of non-English speaking) was more likely to be a ground for exclusion than for specific action. Again, this finding suggests that AHPs' HP practice may be insufficiently aware of the significance of social diversity for health promotion.

15.8.5 Recommendation

Professional (and other relevant) bodies should review curricula (especially post-registration) to ensure that AHPs are equipped with the skills, knowledge and awareness necessary to deliver effective health promotion to ethnic and other minority groups.

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Appendix 1 Quality components of included studies

For a description of the meaning of the individual quality components and the derivation of the overall quality ratings, see **Appendix 2** (Sections I to K).

a) Quantitative study designs

Main reference	Selection bias	Study Design	Confounders	Blinding	Data collection methods	Withdrawals & drop-outs	Overall rating
(239) Ashurst & Dobbie (2003)	Strong	Strong	Strong	Moderate	Weak	Strong	Moderate
(248) Attala & Henderson (2003)	Weak	Weak	Weak	Weak	Weak	Weak	Weak
(199) Barratt et al (2008) (lifestyle intervention)	Weak	Strong	Strong	Weak	Strong	Moderate	Weak
(200) Barratt et al (2008) (Use of sibutramine)	Weak	Weak	Weak	Weak	Strong	Weak	Weak
(287) Baxendale & Hesketh (2003)	Weak	Strong	Weak	Moderate	Strong	Strong	Weak
(259) Brown et al (2001)	Weak	Weak	Weak	Weak	Weak	Weak	Weak
(328) Burgess et al (2009)	Weak	Moderate	Moderate	Weak	Moderate	Moderate	Weak
(240) Casey et al (2002)	Weak	Weak	Weak	Weak	Weak	Weak	Weak
(191) Chapman et al (2005)	Moderate	Weak	Weak	Weak	Weak	Weak	Weak
(188) Cheyette (2007)	Weak	Strong	Weak	Weak	Strong	Moderate	Weak
(167) Clark et al (2000)	Moderate	Strong	Strong	Moderate	Weak	Moderate	Moderate
(303) Coulter & Gallagher (2001)	Moderate	Weak	Strong	Weak	Moderate	Weak	Weak
(80) Critchley et al (2007)	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
(202) DAFNE Study Group (2002)	Weak	Strong	Strong	Weak	Strong	Strong	Weak
(307) Donohoe et al (2000)	Weak	Moderate	Strong	Strong	Strong	Weak	Weak

(154) Dorey et al (2004)	Strong	Strong	Strong	Moderate	Weak	Moderate	Moderate
(249) Drummond et al (2003)	Weak	Weak	Weak	Weak	Weak	Weak	Weak
(143) Eccleston & Eccleston (2004)	Moderate	Weak	Weak	Weak	Strong	Moderate	Weak
(157) Ewings et al (2005)	Weak	Strong	Weak	Moderate	Strong	Weak	Weak
(84) Fashanu & Rastall (2002)	Weak	Strong	Weak	Weak	Strong	Moderate	Weak
(250) Freeman et al (2001)	Moderate	Moderate	Weak	Moderate	Strong	Weak	Weak
(130) Freeman et al (2002)	Moderate	Moderate	Strong	Strong	Strong	Weak	Moderate
(208) Frost et al (2002)	Weak	Weak	Weak	Weak	Moderate	Weak	Weak
(85) Frost et al (2004)	Moderate	Strong	Moderate	Moderate	Strong	Moderate	Moderate
(209) George et al (2008)	Moderate	Moderate	Moderate	Moderate	Weak	Moderate	Moderate
(286) Gibbard et al (2004)	Weak	Strong	Strong	Weak	Moderate	Strong	Weak
(132) Hammond & Freeman (2004)	Weak	Strong	Strong	Strong	Strong	Moderate	Moderate
(247) Hardcastle et al (2008)	Weak	Strong	Strong	Strong	Strong	Moderate	Moderate
(91) Hay et al (2005)	Strong	Strong	Strong	Moderate	Strong	Strong	Strong
(158) Hill et al (2007)	Weak	Moderate	Strong	Weak	Moderate	Moderate	Weak
(219) Hughes et al (2008)	Moderate	Strong	Strong	Weak	Weak	Weak	Weak
(145) Hunt & Bogg (2000)	Weak	Weak	Strong	Weak	Moderate	Strong	Weak
(211) Jackson et al (2007)	Moderate	Strong	Weak	Weak	Weak	Weak	Weak
(95) Johnson et al (2007)	Weak	Strong	Strong	Weak	Strong	Strong	Weak
(319) Karkou et al (2009)	Weak	Weak	Weak	Weak	Moderate	Strong	Weak
(98) Klaber Moffett et al (2005)	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
(101) Klaber Moffett et al (2006)	Moderate	Strong	Strong	Weak	Strong	Moderate	Moderate
(224) Lake (2007)	Weak	Weak	Weak	Weak	Moderate	Strong	Weak
(192) Lamb et al (2002)	Moderate	Strong	Moderate	Strong	Weak	Weak	Weak
(263) Lambert et al (2007)	Moderate	Strong	Strong	Weak	Strong	Weak	Weak
(265) Mairs & Bradshaw (2004)	Weak	Weak	Weak	Weak	Strong	Moderate	Weak
(301) Marks et al (2001)	Weak	Weak	Weak	Weak	Weak	Moderate	Weak

(288) McConachie et al (2005)	Weak	Strong	Strong	Moderate	Moderate	Strong	Moderate
(278) McQueen et al (2006)	Weak	Strong	Weak	Moderate	Strong	Moderate	Weak
(225) Moore et al (2003)	Weak	Strong	Weak	Moderate	Weak	Moderate	Weak
(242) Morey et al (2008)	Strong	Strong	Strong	Weak	Moderate	Strong	Moderate
(134) O'Brien et al (2006)	Weak	Strong	Moderate	Moderate	Strong	Strong	Moderate
(190) Oldroyd et al (2006)	Weak	Weak	Weak	Weak	Weak	Weak	Weak
(285) Pennington et al (2009)	Weak	Weak	Weak	Weak	Moderate	Strong	Weak
(229) Read et al (2004)	Moderate	Weak		Weak	Strong	Weak	Weak
(243) Reddy et al (2009)	Strong	Moderate	Weak	Weak	Weak	Strong	Weak
(232) Sahota et al (2001)	Strong	Moderate	Weak	Weak	Weak	Strong	Weak
(186) Smith et al (2004)	Weak	Strong	Strong	Moderate	Weak	Weak	Weak
(245) Sutton et al (2007)	Strong	Strong	Strong	Weak	Weak	Moderate	Weak
(193) Tolley & Atwal (2003)	Weak	Weak	Weak	Weak	Weak	Weak	Weak
(214) Vyas et al (2003)	Weak	Strong	Moderate	Weak	Moderate	Weak	Weak
(187) Ward et al (2004)	Weak	Strong	Weak	Moderate	Strong	Strong	Weak
(251) Watson et al (2008)	Weak	Strong	Strong	Weak	Strong	Moderate	Weak
(308) Waxman et al (2003)	Weak	Strong	Strong	Moderate	Strong	Strong	Moderate
(176) Wood et al (2008)	Moderate	Strong	Strong	Moderate	Strong	Weak	Moderate

b) Qualitative study designs

Key to quality components (column headings):

- 1) Was there a clear statement of the aims of the research?
- 2) Is a qualitative methodology appropriate?
- 3) Was the research design appropriate to address the aims of the research?
- 4) Was the recruitment strategy appropriate to the aims of the research?
- 5) Were the data collected in a way that addressed the research issue?
- 6) Has the relationship between researcher and participants been adequately considered?
- 7) Have ethical issues been taken into consideration?
- 8) Was the data analysis sufficiently rigorous?
- 9) Is there a clear statement of findings?

Main reference	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Overall rating
(153) Aston & Moulder (2007)	No	Yes	No	No	No	No	No	Yes	Yes	Weak
(182) Belchamber & Gousy (2004)	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	Weak
(162) Booth et al (2006)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Strong
(312) Chatfield (2002)	No	No	No	Yes	No	Yes	No	No	No	Weak
(260) Clark et al (2006)	No	No	No	Yes	No	No	No	No	No	Weak
(129) Clayton et al (2006)	Yes	Yes	No	No	No	No	No	No	Yes	Weak
(299) Cunningham & Ward (2003)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Moderate
(201) Curtis et al (2000)	Yes	Yes	Yes	No	Yes	No	Yes	No	No	Weak
(202) DAFNE Study Group (2002)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Strong
(157) Ewings et al (2005)	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Weak
(131) Hackett et al (2005)	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Moderate
(262) Heasman & Atwal (2004)	No	No	No	No	No	No	No	No	No	Weak

(223) Johnson (2006)	Yes	No	No	No	No	No	No	No	Yes	Weak
(320) Karkou & Glasman (2004)	Yes	Yes	No	No	No	No	No	No	No	Weak
(97) Keeling-Roberts (2004)	Yes		No	Yes	Yes	No	No	Yes	Yes	Moderate
(321) Lofas & Burke (2001)	Yes	No	No	No	No	No	No	Yes	Yes	Weak
(185) Mason (2006)	No	Yes	No	No	No	No	No	No	No	Weak
(290) Miller (2002)	No	Yes	No	No	No	No	No	No	No	Weak
(225) Moore et al (2003)	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Moderate
(310) Moore et al (2003)	Yes	Yes	No	No	No	No	No	No	No	Weak
(291) Nash et al (2001)	Yes	Yes	Yes	No	No	No	No	No	No	Weak
(285) Pennington et al (2009)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Strong
(183) Ream et al (2005)	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Weak
(298) Ross et al (2006)	Yes	Yes	No	No	No	No	Yes	No	No	Weak
(230) Sacher et al (2005)	Yes	No	No	No	Yes	No	No	Yes	Yes	Weak
(212) Sadler et al (2003)	Yes	Yes	No	No	No	No	No	No	No	Weak
(104) Taylor et al (2002)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Weak
(213) Ulahannan et al (2007)	Yes	No	No	No	No	No	No	No	Yes	Weak
(279) Ussher et al (2000)	No	No	No		No	No	No	No	No	Weak
(215) Waller et al (2008)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Moderate

c) Economic evaluations

Key to quality components (column headings):

- 1) Was a well-defined question posed in answerable form?
- 2) Was a comprehensive description of the competing alternatives given (i.e. can you tell who did what to whom, where, and how often)?
- 3) Was the effectiveness of the programme or services established?
- 4) Were all the important and relevant costs and consequences for each alternative identified?
- 5) Were costs and consequences measured accurately in appropriate physical units (e.g. hours of nursing time, number of physician visits, lost work-days, gained life years)?
- 6) Were costs and consequences valued credibly?
- 7) Were costs and consequences adjusted for differential timing?
- 8) Was an incremental analysis of costs and consequences of alternatives performed?
- 9) Was allowance made for uncertainty in the estimates of costs and consequences?
- 10) Did the presentation and discussion of study results include all issues of concern to users?

Main reference	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Num 'Yes' answers
(80) Critchley et al (2007)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10/10
(286) Gibbard et al (2004)	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	7/10
(91) Hay et al (2005)	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	8/10
(95) Johnson et al (2007)	Yes	Can't tell	Yes	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	2/10
(98) Klaber Moffett et al (2005)	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9/10
(101) Klaber Moffett et al (2006)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10/10
(308) Waxman et al (2003)	Yes	Yes	No	No	No	Can't tell	Can't tell	No	No	No	2/10

Appendix 2 Data extraction/critical appraisal form

Section A: Study eligibility and type

This data abstraction form has been adapted from the following sources:

- The form developed by The Guide to Community Preventive Services:
<http://www.thecommunityguide.org/about/abstractionform.pdf>
- The EPPI-Centre's Health promotion data-extraction guidelines (1997)

A.1 Is the study eligible for inclusion in this review?

All studies which have been transferred to the review section have been judged eligible for inclusion in the review by the screeners.

Please indicate whether you feel the study should be included. If 'No' or 'Unclear', please give reasons.

The inclusion criteria are:

- Study published from 2000 onwards
- Study published in English
- Intervention carried out in the UK
- Intervention contains health promotion component(s) (whether or not this is the primary focus of the intervention).
- The health promotion component(s) were delivered by one or more AHPs, working alone or with other professionals.

Please note that intervention-only studies which report no outcomes/results ARE eligible for inclusion.

A.1.1 Yes

A.1.2 No (please give reasons)

A.1.3 Unclear (please give reasons)

A.2 Is further information required?

Is it necessary to contact the study authors because e.g. important aspects of the study are missing or unclear?

If Yes, please state what information is required or what issue(s) need clarification.

A.2.1 Yes (please specify)

A.2.2 No

A.3 What type(s) of study does this publication describe?

Select all that apply. For each option selected, briefly describe the design used.

If the intervention has been economically evaluated (either within the main study or in a separate study) also check the 'Economic evaluation' box. If the HP components have been separately evaluated, also complete Section K.

A.3.1 RCT

An experimental design where investigators randomly allocate eligible people to an intervention or control group. A rater should describe a study as an RCT if the randomization sequence allows each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. If the investigators do not describe the allocation process and only use the words 'random' or 'randomly', the study is described as a controlled clinical trial.

A.3.2 Non-randomized trial/CCT

An experimental study design where the method of allocating study subjects to intervention or control groups is open to individuals responsible for recruiting subjects or providing the intervention. The method of allocation is transparent before assignment, e.g. an open list of random numbers or allocation by date of birth, etc.

A.3.3 Prospective cohort study

A study that follows over time groups of individuals who are alike in many ways but differ by a certain characteristic (for example, female nurses who smoke and those who do not smoke) and compares them for a particular outcome (such as lung cancer).

A.3.4 Retrospective cohort study

A study in which the medical records of groups of individuals who are alike in many ways but differ by a certain characteristic (for example, female nurses who smoke and those who do not smoke) are compared for a particular outcome (such as lung cancer). Also called historic cohort study.

A.3.5 Case-control study

A retrospective study design where the investigators gather 'cases' of people who already have the outcome of interest and 'controls' who do not. Both groups are then questioned or their records examined about whether they received the intervention exposure of interest.

A.3.6 Time series study

A time series consists of multiple observations over time. Observations can be on the same units (e.g. individuals over time) or on different but similar units (e.g. student achievement scores for particular grade and school). Interrupted time series analysis requires knowing the specific point in the series when an intervention occurred.

A.3.7 Before and after study

A study in which characteristics of a population or a group of individuals are compared before versus after a particular event or intervention, for example the introduction of a new healthcare service, to gauge what the effects of the event or intervention have been.

A.3.8 Cross-sectional study/survey

An epidemiological study which describe characteristics of populations. They are 'cross sectional' because data is collected at one point in time and then the relationships between characteristics are considered. Importantly, because such a study doesn't look at time trends, it can't establish what causes what.

A.3.9 Qualitative study

Qualitative research uses individual in-depth interviews, focus groups or questionnaires to collect, analyse and interpret data by observing what people do and say. It reports on the meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of things. It is more subjective than quantitative research and is often exploratory and open-ended. Small numbers of people are interviewed in-depth and/or a relatively small number of focus groups are conducted.

A.3.10 Economic evaluation

The comparison of two or more alternative courses of action in terms of both their costs AND consequences. Exclude cost-only studies (code as 'Resource utilisation/costs study'). State which type of evaluation: Cost minimisation analysis, Cost-effectiveness analysis, Cost-utility analysis, Cost-consequences analysis, Cost benefit analysis (See http://www.york.ac.uk/inst/crd/SysRev/ISSI/WebHelp/5_1_INTRODUCTION_TO_SYSTEMATIC_REVIEWS_OF_ECONOMIC_EVALUATIONS.htm for definitions.)

A.3.11 Resource utilisation/costs study

Only reports costs and other resources used/allocated, with no consequences or evaluation.

A.3.12 Intervention only

Describes an intervention, with no results or evaluation reported.

A.3.13 Review - systematic

A.3.14 Review - not systematic

A.3.15 Meta-analysis

A.3.16 Secondary report

A.3.17 News item/commentary/book review

Including editorials and general overviews.

A.3.18 Guideline(s)

A.3.19 Methods/theoretical study

A.3.20 Policy document

A.3.21 Other (please describe)

A.4 What is the study's publication status?

A.4.1 Published

A.4.2 In press

A.4.3 Unpublished

Section B: Background, aims and development of the intervention/evaluation

B.1 Was study background information provided?

Provide any relevant background information to the intervention/study given by the authors.

Include, where available:

- The policy context (e.g. local/national policy priorities/initiatives to which the intervention is a response).
- Local circumstances and demographic/epidemiological factors.
- Relevant previous initiatives.
- Funding source of the study, if salient.
- Whether the intervention was based on a needs assessment.
- Any other relevant information.

B.1.1 Yes (please describe)

B.1.2 No (please comment)

B.2 Were the aims of the intervention stated?

Include who identified the aims, if stated.

B.2.1 Aims explicitly stated (please describe)

As stated by the authors.

B.2.2 Aims clear, but not explicitly stated (please describe)

B.2.3 Aims not stated (please comment)

B.3 Was information provided on who developed the intervention/evaluation?

If Yes, please state whether:

- Evaluator
- Funder
- Health promotion practitioner
- Intervention provider
- (A sample of the) study population (specify)
- (A sample of the) target population (specify)
- Other (specify)

And indicate which were involved in developing the intervention and the evaluation (process/outcome measures).

B.3.1 Yes (please specify)

B.3.2 No

B.4 Was there any community/consumer involvement in the study?

If Yes, please state which groups/individuals were involved/consulted, and for each state the nature of their involvement (e.g. research priorities, the design, delivery or evaluation of the intervention).

B.4.1 Yes (please describe)

B.4.2 No

B.5 Was the intervention piloted (or is this a pilot)?

A pilot study involves preliminary use of some or all of the elements of the intervention in order to refine the intervention or its delivery. This does not include similar interventions tested by others.

If a pilot is included as a linked study, briefly describe the intervention and results (e.g. using the abstract).

B.5.1 Yes - the authors consider this study to be a pilot

B.5.2 Yes - previously piloted with the study population (describe)

B.5.3 Yes - previously piloted with a sample of the target population (specify and describe)

B.5.4 Yes - previously piloted with others (specify and describe)

B.5.5 No

B.5.6 Unclear/not stated

Section C: Location(s) and setting(s) of the intervention

The intervention might be delivered in a particular type of setting or community-wide. The setting(s) and location(s) should be described for the intervention as it was implemented, which might be in a setting broader than that which was studied in the evaluation.

C.1 In which country/countries of the UK was the study carried out?

If an international study, select the country/countries in which the UK part of the study was carried out.

C.1.1 UK-wide

C.1.2 England

C.1.3 Scotland

C.1.4 Wales

C.1.5 Northern Ireland

C.1.6 Not specified (please comment)

C.2 Is the study part of an international study?

If Yes, please give countries and details of the wider study.

C.2.1 Yes (please give countries and details)

C.2.2 No - UK only

C.3 In which SHAs was the intervention delivered?

Select all that apply.

For interventions prior to July 2006, use current SHA.

C.3.1 Intervention not delivered in England

C.3.2 Intervention delivered England-wide

C.3.3 East Midlands

C.3.4 East Of England

C.3.5 London

C.3.6 North East

C.3.7 North West

C.3.8 South Central

C.3.9 South East Coast

C.3.10 South West

C.3.11 West Midlands

C.3.12 Yorkshire and The Humber

C.4 Geographical location in which intervention was delivered

C.4.1 City/Town/Village (please specify)

C.4.2 County/Unitary Authority (please specify)

C.4.3 Not stated/unclear

C.4.4 Not applicable (e.g. mass media)

C.5 What was the population density of the location?

Was the study done in an urban, suburban, or rural setting?

- Select the appropriate box AS DESIGNATED BY THE AUTHORS.

- Select "Mixed" ONLY if the intervention was applied to the entire population of a large geographic area that likely covers urban, suburban, and rural settings.

- If the authors do not state the population density but provide ancillary information that allows you to make that determination (e.g., population size, description of the setting, and other community characteristics), use your best judgment to check one of the boxes.

- If you are unsure about the population density, but the authors report the population size or other information, select "Unclear" and enter that information.

- Check "Not reported" if the authors do not provide sufficient information about the community to determine the population density.

C.5.1 Urban

C.5.2 Suburban

C.5.3 Rural

C.5.4 Mixed

C.5.5 Not stated/unclear

C.5.6 Not applicable (e.g. mass media)

C.6 Study setting(s)

What was/were the setting(s) in which the intervention was implemented for the purposes of conducting the study?

Select all that apply, and give details, e.g. name of hospital/school/media outlet.

- C.6.1 Correctional institution
- C.6.2 Community site
- C.6.3 Day care centre
- C.6.4 Education - pre-school
- C.6.5 Education - primary
- C.6.6 Education - secondary
- C.6.7 Education - tertiary
- C.6.8 Family centre
- C.6.9 Home
- C.6.10 Hospice
- C.6.11 Hospital - NHS
- C.6.12 Hospital - non-NHS
- C.6.13 Mass media - local/community
- C.6.14 Mass media - regional
- C.6.15 Mass media - national
- C.6.16 Mass media - international
- C.6.17 Outreach
- C.6.18 Primary care
- C.6.19 Residential care/nursing home
- C.6.20 Specialist clinic
- C.6.21 Street
- C.6.22 Workplace
- C.6.23 Other (please describe)
- C.6.24 Not specified (please comment)

Section D: People involved with the intervention

D.1 Which type(s) of organisation implemented the intervention? (give details)
i.e., directly interacted with the population under study, not organisations that might have provided scientific or financial support.

Select all that apply, and give details, e.g. name, focus and location of organisation. Each organisation should appear under only ONE heading (if multiple, select the most salient).

- D.1.1 GP practice/health centre
 - D.1.2 Hospital - NHS
 - D.1.3 Hospital - non-NHS
 - D.1.4 Hospice
 - D.1.5 Other clinical organisation
 - D.1.6 Residential/nursing home
 - D.1.7 Public health organisation
 - D.1.8 Governmental organisation - local
 - D.1.9 Governmental organisation - regional
 - D.1.10 Governmental organisation - national
 - D.1.11 Professional body
 - D.1.12 Charity/not-for-profit organisation - local/regional
 - D.1.13 Charity/not-for-profit organisation - national
 - D.1.14 Charity/not-for-profit organisation - international
 - D.1.15 Community-based organisation
 - D.1.16 School/college
 - D.1.17 HEI
 - D.1.18 Correctional institution
 - D.1.19 Private company
 - D.1.20 Other (please specify)
 - D.1.21 Not specified (please comment)
- D.2 Which AHP group(s) were involved with the intervention?
Select all that apply.

For each option selected, indicate:

- Numbers of professionals involved (specify if unclear or not stated).
- How they were recruited and assigned (specify if unclear or not stated).
- What training they received (specify if none or not stated).
- What roles they played in the intervention (specify if unclear or not stated).

D.2.1 Art therapist(s)

D.2.2 Art therapist(s) - ESP/consultant

D.2.3 Art therapy assistant(s)

D.2.4 Dietitian(s)

D.2.5 Dietitian(s) - ESP/consultant

D.2.6 Dietetic assistant(s)

D.2.7 Dramatherapist(s)

D.2.8 Dramatherapist(s) - ESP/consultant

D.2.9 Dramatherapy assistant(s)

D.2.10 Music therapist(s)

D.2.11 Music therapist(s) - ESP/consultant

D.2.12 Music therapy assistant(s)

D.2.13 Occupational therapist(s)

D.2.14 Occupational therapist(s) - ESP/consultant

D.2.15 Occupational therapy assistant(s)

D.2.16 Optometrist(s)/Optician(s)

D.2.17 Optometrist(s)/Optician(s) - ESP/consultant

D.2.18 Optometric assistant(s)

D.2.19 Orthoptist(s)

D.2.20 Orthoptist(s) - ESP/consultant

D.2.21 Orthoptic assistant(s)

D.2.22 Paramedic(s)

D.2.23 Paramedic(s)/ - ECP/ESP/consultant

D.2.24 Physiotherapist(s)

D.2.25 Physiotherapist(s) - ESP/consultant

D.2.26 Physiotherapy assistant(s)

D.2.27 Podiatrist(s)/Chiropodist(s)

D.2.28 Podiatrist(s)/Chiropodist(s) - ESP/consultant

D.2.29 Podiatry assistant(s)

D.2.30 Prosthetist(s)/Orthotist(s)

D.2.31 Prosthetist(s)/Orthotist(s) - ESP/consultant

D.2.32 Prosthetic/orthotic technician(s)

D.2.33 Radiographer(s)

D.2.34 Radiographer(s) - ESP/consultant

D.2.35 Radiography assistant(s)

D.2.36 Speech and language therapist(s)

D.2.37 Speech and language therapist(s) - ESP/consultant

D.2.38 Speech and language therapy assistant(s)

D.3 What role(s) did AHPs play in the intervention?

Select all that apply. No need to enter further details (these should be entered above).

D.3.1 Planning/development

D.3.2 Advising on planning/implementation/evaluation

D.3.3 Training those delivering the intervention

D.3.4 Delivery of the intervention (interacting with study population)

D.3.5 Evaluation of the intervention

D.3.6 Other (please specify)

D.4 Were more than one AHP group involved with the intervention?

No need to enter further details.

D.4.1 Yes

D.4.2 No

D.5 Which other professional group(s) were involved in providing the intervention?

Select all that apply.

For each option selected, indicate:

- Numbers of professionals involved (specify if unclear or not stated).

- How they were recruited and assigned (specify if unclear or not stated).
- What training they received (specify if none or not stated).
- What roles they played in delivering the intervention (specify if unclear not stated).
- D.5.1 No other professionals involved
- D.5.2 Care/residential workers
- D.5.3 Carers
- D.5.4 Community workers
- D.5.5 Counsellors
- D.5.6 Doctors - hospital
- D.5.7 Doctors - primary care/GPs
- D.5.8 Midwives
- D.5.9 Nurses
- D.5.10 Parents
- D.5.11 Patients
- D.5.12 Peers
- D.5.13 Psychologists
- D.5.14 Public health/health promotion practitioners
- D.5.15 Researchers
- D.5.16 Social workers
- D.5.17 Teachers/lecturers
- D.5.18 Other (please describe)
- D.6 Were AHPs leading the intervention?
- D.6.1 Yes (describe which)
- D.6.2 No (describe who led the intervention)

Section E: Population group(s) targeted by the intervention

This section refers to the populations ELIGIBLE to receive the intervention, which might be broader than the populations that were studied in the evaluation.

E.1 Which age group(s) were targeted?

Select all that apply. For each selected option, provide any further details reported by the authors, e.g. specific characteristics, numbers.

If different categories are used in the study, select the most appropriate option and state/define the categories used.

- E.1.1 All/any age groups
- E.1.2 Children - infants/pre-school age
- E.1.3 Children - primary school age
- E.1.4 Young people/adolescents
- E.1.5 Adults
i.e. people aged 18 or above.
- E.1.6 Working age
- E.1.7 Older people
- E.1.8 Not applicable (please comment)

E.2 Which sex(es) were targeted?

Select just ONE option and provide any further details reported by the authors, e.g. specific characteristics, numbers.

- E.2.1 Both sexes
- E.2.2 Females
- E.2.3 Males
- E.2.4 Not reported (please comment)
- E.2.5 Not applicable (please comment)

E.3 Which ethnic group(s) were targeted?

Select all that apply. For each selected option, provide any further details of the group given by the authors, e.g. numbers, countries of origin, languages spoken.

Categories taken from the 2001 Census (Level 1 categories).

- E.3.1 All/any ethnic groups

- E.3.2 White
 - E.3.3 Mixed
 - E.3.4 Asian or Asian British
 - E.3.5 Black or Black British
 - E.3.6 Chinese
 - E.3.7 Other ethnic group (please specify)
 - E.3.8 Not applicable (please comment)
 - E.4 Which occupational/socio-economic group(s) were targeted?
- Select all that apply. For each selected option, provide any further details of the group given by the authors, e.g. long-term unemployed, university students, numbers.

Use reasonable judgement to select a category if the authors provide ancillary information (e.g., educational attainment), and state where this is the case.

- E.4.1 All/any occupational/socio-economic groups
 - E.4.2 Carers/home-makers
 - E.4.3 Employed/self-employed
 - E.4.4 Homeless
 - E.4.5 Low-income groups
 - E.4.6 Middle/upper income groups
 - E.4.7 Retired
 - E.4.8 Sick/disabled
 - E.4.9 Students/school children
 - E.4.10 Unemployed
 - E.4.11 Not applicable
 - E.5 Which religious group(s) were targeted?
- Select all that apply. For each selected option, provide any further details of the group given by the authors, e.g. numbers, religious denominations, churchgoers.

Categories taken from the 2001 Census.

- E.5.1 All/any religious groups
 - E.5.2 Christian
 - E.5.3 Buddhist
 - E.5.4 Hindu
 - E.5.5 Jewish
 - E.5.6 Muslim
 - E.5.7 Other religious group (please specify)
 - E.5.8 Not applicable
 - E.6 Which sexual orientation(s) were targeted?
- Select all that apply. For each selected option, provide any further details of the group given by the authors, e.g. numbers, subcategories.
- E.6.1 All/any sexual orientations
 - E.6.2 Heterosexual
 - E.6.3 Gay/MSM
 - E.6.4 Lesbian/WSW
 - E.6.5 Bisexual
 - E.6.6 Transgender/transsexual
 - E.6.7 Not applicable (please comment)
 - E.7 Which health status(es) were targeted?
- This refers to whether the population has any pre-existing health conditions which are relevant to the intervention.

The condition(s) may or may not be the same as the conditions which are the focus of the intervention (see next section), e.g. prevention of falls (the intervention focus) among people with osteoporosis.

- Select all that apply. For each selected option:
- Specify the condition(s), if applicable, using the condition descriptors EXACTLY as they appear in the next section (where available).
 - Provide any further details given by the authors, e.g. numbers.
- E.7.1 No pre-existing conditions/general population

- E.7.2 Pre-existing condition(s) - same as intervention focus (describe)
E.7.3 Pre-existing condition(s) - different from intervention focus (describe)
E.7.4 Not reported/unclear (please comment)
E.7.5 Not applicable (please comment)
E.8 Were any other demographic/risk factor groups targeted?
Select all that apply.

If Yes, specify whether the factors were health-related or not health-related and provide any other demographic/risk factor information or potential confounding factors reported by the authors.

Examples:

- Health-related: heavy smokers/drinkers, athletes/extreme sports.
- Not health-related: family structure/size, migrant status, educational attainment.

E.8.1 Yes - health-related

E.8.2 Yes - not health-related

E.8.3 No

E.8.4 Not applicable (please comment)

E.9 Was an "ultimately affected" population described?

Some interventions are directed at a specific study population, but ultimately affect health or other related outcomes (e.g. behaviours) that are measured in a different population.

Examples:

- a provider education intervention is directed at health care providers (the "study population"), but the health outcome occurs in their patients (the "ultimately affected" population).
- an educational intervention directed at parents (the "study population") ultimately affects their children (the "ultimately affected" population).

If 'Yes', state which groups were in the expected "ultimately affected" population, and provide any further details provided by the authors, e.g. numbers.

E.9.1 Yes (please describe)

E.9.2 No

Section F: Description of the intervention

F.1 Was the intervention part of a wider intervention effort?

e.g. a school based anti-drug educational program was implemented as a segment of a national health risk behaviour modification program and is evaluated in this study.

F.1.1 Yes (please describe)

F.1.2 No

F.1.3 Not specified

F.2 Was health promotion the primary focus of the intervention?

Select Yes if an HP intervention is the 'joint' primary focus, e.g. if it comprises one arm of a controlled trial. If this is the case, please state and briefly describe the intervention(s) comprising the other arm(s).

If in doubt, refer to the review team.

F.2.1 Yes

F.2.2 No (please describe the main focus)

F.2.3 Not applicable (please comment)

F.3 Which condition(s) was the focus of the intervention?

This refers to the condition(s) which the intervention is attempting to PREVENT (if primary HP) or manage/control/prevent from recurring (if 2-ary/3-ary/4-ary HP). These conditions may or may not be the same as the pre-existing conditions described in the previous section.

Select all that apply. For each selected option, indicate the precise condition(s) and provide any relevant details given by the authors.

F.3.1 No specific condition(s) targeted

- F.3.2 Accidents/injuries (not falls)
- F.3.3 Alcohol(ism)
- F.3.4 Cardiovascular disorders (not stroke)
- F.3.5 Cancer - breast
- F.3.6 Cancer - lung
- F.3.7 Cancer - skin
- F.3.8 Cancer - prostate/testicular
- F.3.9 Cancer - other
- F.3.10 Child abuse/neglect
- F.3.11 Diabetes
- F.3.12 Disease (communicable)
- F.3.13 Drug abuse
- F.3.14 Eating disorder (not obesity)
- F.3.15 Epilepsy
- F.3.16 Falls
- F.3.17 Foot/ankle/gait disorders
- F.3.18 Genitourinary disorders/incontinence (not cancer)
- F.3.19 Glaucoma/eye disorders
- F.3.20 Hand disorders/carpal tunnel syndrome
- F.3.21 HIV/AIDS
- F.3.22 Mental health problems/suicide
- F.3.23 Musculoskeletal - arthritis/joint disorders
- F.3.24 Musculoskeletal - muscular/back pain
- F.3.25 Musculoskeletal - osteoporosis/bone disorders
- F.3.26 Neurological disorders/dementia (not speech/language)
- F.3.27 Obesity/overweight
- F.3.28 Physical/sexual abuse (non child)
- F.3.29 Pregnancy/birth control
- F.3.30 Respiratory diseases/asthma
- F.3.31 Speech/language/voice/swallowing disorders
- F.3.32 STDs/sexual health (not HIV/AIDS)
- F.3.33 Stroke
- F.3.34 Other (please specify)

F.4 Which behaviour(s) was the focus of the intervention?

Select all that apply. For each selected option, provide specific details given by the authors not covered elsewhere in this section.

- F.4.1 Activities of daily living/practical skills
- F.4.2 Self-management of the target condition(s)
- F.4.3 Drug/alcohol/solvent avoidance/reduction
- F.4.4 Healthy eating/diets
- F.4.5 Hygiene improvement
- F.4.6 Parenting behaviour
- F.4.7 Physical activity/exercise
- F.4.8 Problem behaviour/aggression
- F.4.9 Self-esteem/self-efficacy
- F.4.10 Sexual behaviour/contraception
- F.4.11 Smoking cessation
- F.4.12 Suicide
- F.4.13 Other (please specify)
- F.4.14 Not stated (please comment)

F.5 Were incentives offered to recruit people to the study?

F.5.1 Yes (please describe)

F.5.2 No

F.5.3 Not stated

F.6 Was consent requested prior to entering the study?

This refers to the eligible sample.

If Yes, from what proportion of the sample was consent obtained?

F.6.1 Yes - requested from participants

F.6.2 Yes - requested from others (please specify)

- F.6.3 No
- F.6.4 Not stated
- F.6.5 Not applicable (e.g. mass media)
- F.7 What was the health promotion level(s) of the intervention?
Select all that apply.

If more than one option is selected, briefly indicate which part(s) of the intervention fall under which category.

F.7.1 Primary health promotion
Involves promoting the health of the general population to maintain health, prevent ill health and health damaging behaviour, and improve QoL.

F.7.2 Secondary health promotion
Promotes the health of individuals or groups where health damaging behaviour has already occurred, to change behaviour and prevent health moving to a chronic or irreversible stage.

F.7.3 Tertiary health promotion
Promotes the health of those with chronic conditions or a disability to enhance quality of life and potential for healthy living.

F.7.4 Quaternary health promotion
Promotes the emotional, social and physical health and wellbeing of the terminally ill.

F.7.5 Not applicable (please comment)

F.8 Was the intervention based EXPLICITLY on a specific HP approach/theory?

F.8.1 Yes

F.8.2 No

F.9 On which health promotion approach(es)/theory(ies) was the intervention based?
Select all that apply. Whether or not the intervention was explicitly based on a specific approach/theory, give details of the approach used, including the name (if specified).

If "Other/Unclear", enter any information provided which might help identify the framework.

F.9.1 Health education/provision of information only

These interventions try to change knowledge, attitudes or norms.

Intervention methods might involve instruction/advice (e.g., classes, assemblies), small media (e.g., brochures, leaflets, posters, letters, newsletters) or large media (e.g., television, radio, newspapers, billboards).

F.9.2 Behavioral interventions/individual empowerment

These interventions try to change behaviours by providing necessary skills or materials. They may try to build psychological perception, self-esteem, self-efficacy, motivation or internal locus of control.

Intervention methods might involve modelling or demonstration, role playing, participatory skill development, individual benchmarking (i.e. goal-setting and achievement), providing feedback, providing incentives or penalties, or providing materials necessary to perform the desired behaviour (e.g., condoms, car seats).

F.9.3 Community development/empowerment

This might include:

- advising and working with local government, the voluntary sector and other organisations (e.g. to increase employment opportunities, build community coalitions);
- lobbying, advocacy and mediation;
- social marketing and the use of mass media, including the Internet.

F.9.4 Structural adjustment

These interventions try to change behaviours or alter disease risk factors through e.g.

- legislation and its enforcement (e.g. smoking bans, vaccination, mandatory seat belt use laws)
- taxation/fiscal measures (e.g. tobacco taxes)
- development of registries and surveillance systems
- increasing provision/access to or improving services
- healthy public policies, organisational development, socio-political and economic change

F.9.5 Other/unclear (give available information)

F.10 Which media were used to deliver the intervention?

Select all that apply.

For each selected option, briefly provide details (e.g. formats, how media were distributed, group/class sizes, names of media organisations, websites, etc.).

Try to avoid duplicating information given in other questions.

F.10.1 Cinema

F.10.2 Email

F.10.3 Newspaper/magazine

F.10.4 Poster/billboard/sticker

F.10.5 Printed material - mailed

e.g. leaflets, information sheets, letters, postcards.

F.10.6 Printed material - not mailed

e.g. leaflets, information sheets, letters.

F.10.7 Radio

F.10.8 Telecare/telehealth/videoconferencing

F.10.9 Telephone

F.10.10 Television

F.10.11 Verbal/face-to-face - one-to-one

F.10.12 Verbal/face-to-face - small group/class

F.10.13 Verbal/face-to-face - large group/class

F.10.14 Video/DVD/CD

F.10.15 Website/internet

F.10.16 Other (please describe)

F.11 Description of the intervention?

** THE MAIN DESCRIPTION OF THE INTERVENTION SHOULD BE ENTERED HERE **

Please include, where available:

- Timescale of the intervention (not its measurement/evaluation), including relevant time periods/dates, frequency, and duration. If the intervention is (as far as can be ascertained) ongoing, state 'ongoing'.

- The total number eligible for inclusion in the study (N = sampling frame) (for studies in which the investigator allocated subjects to intervention/comparison groups).

- A brief description of sampling and recruitment methods used.

- How the study participants were allocated to intervention and comparison groups (provide numbers/percentages for each population group). Baseline data are preferred. If not reported enter "Not reported". Provide information for the study population as a whole only if the authors do not report data for intervention and comparison groups separately. If the authors provide only descriptive information about the reference population (the population from which the study population was drawn), provide that data.

- For age-related groups, provide median/range, mean/standard deviation, other measure of central tendency or indicate "not reported". If a proxy for age (e.g. school grade) is presented, indicate the range and units.

- Whether any intervention(s) were deliberately or inadvertently applied to the comparison group(s).

- How exposure to the intervention was assessed (e.g. resource utilisation, observation, interview, test, record review). Also include the definition of the exposure variable(s) used and level of exposure to the intervention (for each sub-group, if different).

- Any further relevant details about the intervention reported by the authors, e.g. incentives offered.

Please also provide:

- Page/table numbers;
 - p values or confidence intervals, where available.
- F.11.1 Please describe the intervention

Section G: Outcome/process measures and results

G.1 Was this intervention evaluated?

Select Yes if any evaluation of outcome or process measures took place, even if the HP components were NOT evaluated.

If No, skip the remainder of this section and complete Section H ONLY.

G.1.1 Yes

G.1.2 No (intervention only study) - skip the rest of this section and complete Section H ONLY

G.2 Were the HP components of the intervention evaluated?

This refers to any HP components with which AHPs were involved.

If the HP component(s) were not specifically/separately evaluated, or evaluated only as part of a wider, multi-component intervention also involving non-HP components (i.e. the intervention was evaluated as a whole and the effects of the HP component cannot be isolated), then briefly describe the evaluation/results (e.g. copy/paste the relevant sections from the abstract). Then skip the rest of this section and complete Section H **only** (i.e. no need for quality assessment).

G.2.1 Yes - HP component(s) was specifically evaluated

G.2.2 Yes - but only as part of a wider intervention (briefly describe evaluation then skip rest of section)

The HP component was only evaluated as part of a multi-component intervention, i.e. the HP component was not separately evaluated. Briefly describe the evaluation/results, skip the rest of this section and complete Section H **only**.

G.2.3 No (briefly describe evaluation then skip rest of section)

There was an evaluation, but only of non-HP components of the intervention. Briefly describe the evaluation/results, skip the rest of this section and complete Section H **only**.

G.3 Who carried out the evaluation?

Select all that apply. For each selected option, give any information provided on:

- How the the evaluators were selected
- Whether special training was provided for the evaluators

G.3.1 Those providing the intervention (specify)

If a subset, specify who carried out the evaluation.

G.3.2 Independent researcher(s) - AHP (specify)

G.3.3 Independent researcher(s) - non-AHP (specify)

G.3.4 (Individuals from the) target population (specify)

G.3.5 Others (specify)

G.3.6 Unclear/not stated

G.4 How were outcome and other variables measured?

Select all that apply. For each selected option, provide any available information on:

- type(s) and name(s) of instruments/measurement tools used;
- whether the tool(s) have been used in previous published studies or specifically developed for the current study;
- observer or interviewer training and blinding;
- inter-observer agreement;
- where and when the variables were measured, if relevantly different from the intervention setting/time period.

Example: The study reported observed correct use of child-restraint devices, using trained but unblinded observers. Interobserver agreement was performed. Check the response option 'Observation' and provide the following: 'Correct use defined as child-restraint device tethered to automobile seat with child appropriately harnessed. Observers trained, not

blinded. Inter-observer agreement for use = 93% and for estimated age of the child = 83%,
k = .76, and .64, respectively.'

G.4.1 Resource utilization

e.g. hours of media exposure or number of reminders distributed.

G.4.2 Observation

G.4.3 Interview

Telephone or in-person interview

G.4.4 Self-administered questionnaire/report

Any written questionnaire/report that is completed by study participants.

G.4.5 Practical test

G.4.6 Psychological test

G.4.7 Clinical/laboratory test

e.g. serum or urine drug levels to assess compliance with drug therapy.

G.4.8 Record review

G.4.9 Other (please specify)

G.4.10 Unclear (please explain)

G.4.11 Not reported/Did not assess

G.5 What were the primary outcome measure(s) and results?

This refers to the outcomes which were intended to be measured.

Select all that apply. Where available, for each type of outcome measure selected:

- provide the definition of the outcome measure(s) used by the authors;
 - state if it is an intermediate outcome (i.e. one that precedes or is correlated with the outcomes of interest), or a surrogate outcome (i.e. one that is considered to be a proxy for the outcomes of interest);
 - state the individuals/groups whose outcomes were intended to be measured;
 - describe any pre-intervention measurements which were made (with timings);
 - state if no or only partial data were reported after the intervention (and state why not, or for which groups data were reported);
 - report the results for each arm of the study (as applicable);
 - report the results for each time period measured as applicable to the study design;
 - provide page and table numbers, where applicable.
- G.5.1 Quality of life - condition-specific
Measured by a condition-specific QoL instrument.
- G.5.2 Quality of life - general
Measured by a general instrument, e.g. EuroQoL.
- G.5.3 Self-management skills relating to the target condition(s)
- G.5.4 Knowledge/awareness/beliefs/attitudes
- G.5.5 Intentions
- G.5.6 Self-efficacy/self-esteem/self-confidence
- G.5.7 Behaviour (observed)
e.g., observed correct use of child-restraint devices by children aged < 5 years.
- G.5.8 Behaviour (reported)
- G.5.9 Practical skill
- G.5.10 Service use
- G.5.11 Access to/availability of resources
- G.5.12 Clinical risk factor(s)
- G.5.13 Non-fatal health outcome/severity of illness
- G.5.14 Death
- G.5.15 Legislation/regulation/policy change
- G.5.16 Other (please specify)
- G.5.17 No outcome measure(s)/not stated

G.6 Were secondary results reported?

Were secondary results of interest reported (including subpopulation differences, dose-response relationships, or others)?

If 'Yes', describe those results, including page and table numbers.

Example: the effect was stronger among African-American children (the postcard reminder resulted in 70% of children being up to date on immunizations at age 2 years compared to 20% of children who received 'usual care').

G.6.1 Yes (please describe)

G.6.2 No

G.7 Which processes were evaluated?

Select all that apply. For each selected option, also provide any information on:

- the methods used to collect data on the processes involved (e.g. documentation, focus group, interview, observation, self-completion report, questionnaire);
- who the data were collected from (e.g. intervention providers, a sample of the study population);
- any conclusions offered by the authors.

G.7.1 No processes were evaluated

G.7.2 Perceptions, understanding or acceptability of the intervention

G.7.3 Accessibility of the intervention/programme reach

G.7.4 Consultation/collaboration/partnerships (specify)

G.7.5 Content of the intervention

G.7.6 Implementation/delivery of the intervention

G.7.7 Costs associated with the intervention

G.7.8 Management and responsibility

G.7.9 Quality of the programme materials

G.7.10 Skills and training of the intervention providers

G.7.11 Other (specify)

G.8 Who were the findings reported back to?

Select all that apply. For each selected option, give brief details.

G.8.1 To all in the study population

G.8.2 To some in the study population (specify)

G.8.3 To all intervention providers

G.8.4 To some intervention providers (specify)

G.8.5 To the target population

G.8.6 To others (specify)

G.8.7 Not stated/unclear

G.9 Was an economic evaluation carried out?

Select type of evaluation and provide brief details and results. Applies whether the evaluation appears within the main study, or in a separate (linked) study. Exclude cost-only studies (enter any costs information above).

For definitions, see http://www.york.ac.uk/inst/crd/CRD_Reports/crdreport4_ph2.pdf, Box 2.6

If the HP components have been separately evaluated, also complete Section K.

G.9.1 No/unknown

G.9.2 Cost-effectiveness analysis

G.9.3 Cost-utility analysis

G.9.4 Cost-consequences analysis

G.9.5 Cost minimisation analysis

G.9.6 Cost-benefit analysis

G.9.7 Other (please specify)

Section H: Feasibility, implications and other issues

H.1 Which feasibility or other issues were addressed?

Which of the following feasibility and other key issues were addressed by the authors?

Select all that apply. For each selected option, give details and page numbers.

H.1.1 Costs of the intervention

Include monetary, nonmonetary or human resources.

H.1.2 Potential harms of the intervention

Includes health and social consequences

H.1.3 Other benefits

H.1.4 Implementation of the intervention

H.1.5 Barriers to development, implementation or evaluation (or factors favourable to them)

H.1.6 Community acceptance or involvement

Include any views/involvement not mentioned above.

H.1.7 Formation or use of existing coalitions to develop, implement, or evaluate interventions

H.1.8 Ethical issues and constraints

H.1.9 Other issues (please describe)

H.1.10 No other issues were addressed

H.2 Were implications for policy/practice/theory/further research identified?

Describe any implications identified by the authors for:

- policy relating to AHPs;
- AHP practice, education or training;
- management or delivery/organisation of services

Also describe any theoretical contributions/advances, and any suggestions for further research.

H.2.1 Yes (please describe)

H.2.2 No

H.3 Other relevant information?

Include any other information that you feel we should be aware of or that will aid you in evaluating the quality of the intervention (below), if applicable.

H.3.1 Yes (please describe)

H.3.2 No

H.4 Does the study include relevant references?

Identify any publications from the reference list that you feel may be relevant to this review and should be followed up by the review team, e.g.:

- other primary studies
- reviews
- theoretical papers
- potentially useful background material.

Please enter/paste in full publication details. You don't need to check whether the references have already been identified in the review.

H.4.1 Yes (please specify)

H.4.2 No

Section I: Quality assessment - quantitative studies

Use this for RCTs, controlled clinical trials, cohort studies, case control studies and interrupted time series.

Adapted from the "Quality Assessment Tool for Quantitative Studies" (McMaster University): <http://www.myhamilton.ca/myhamilton/CityandGovernment/HealthandSocialServices/Research/EPHPP>.

Due to under-reporting or lack of clarity in the primary study, raters will need to make judgements about the extent that bias may be present.

When making judgements about each component, raters should form their opinion based upon information contained in the study rather than making inferences about what the authors intended.

Please give a brief explanation/justification next to each answer.

I.1 A1) SELECTION BIAS. Are the individuals selected to participate in the study likely to be representative of the target population?

Participants are more likely to be representative of the target population if they are randomly selected from a comprehensive list of individuals in the target population (score very likely).

They may not be representative if they are referred from a source (e.g. clinic) in a systematic manner (score somewhat likely) or self-referred (score not likely).

I.1.1 Very likely

I.1.2 Somewhat likely

I.1.3 Not likely

I.1.4 Can't tell

I.2 A2) SELECTION BIAS. What percentage of selected individuals agreed to participate?

Refers to the % of subjects in the control and intervention groups that agreed to participate in the study before they were assigned to intervention or control groups.

I.2.1 80 - 100% agreement

I.2.2 60 - 79% agreement

I.2.3 Less than 60% agreement

I.2.4 Not applicable

I.2.5 Can't tell

I.3 A3) SELECTION BIAS. Rate Section A

Strong: The selected individuals are very likely to be representative of the target population (A1 is 1) and there is greater than 80% participation (A2 is 1).

Moderate: The selected individuals are at least somewhat likely to be representative of the target population (A1 is 1 or 2); and there is 60 - 79% participation (A2 is 2). 'Moderate' may also be assigned if A1 is 1 or 2 and A2 is 5 (can't tell).

Weak: The selected individuals are not likely to be representative of the target population (A1 is 3); or there is less than 60% participation (A2 is 3) or selection is not described (A1 is 4); and the level of participation is not described (A2 is 5).

I.3.1 Strong

I.3.2 Moderate

I.3.3 Weak

I.4 B1) STUDY DESIGN. Was the study described as randomized?

In this section, raters assess the likelihood of bias due to the allocation process in an experimental study.

For observational studies, raters assess the extent that assessments of exposure and outcome are likely to be independent.

Generally, the type of design is a good indicator of the extent of bias. In stronger designs, an equivalent control group is present and the allocation process is such that the investigators are unable to predict the sequence.

Score YES, if the authors used words such as random allocation, randomly assigned, and random assignment.

Score NO, if no mention of randomization is made.

I.4.1 Yes

I.4.2 No

I.5 B2) STUDY DESIGN. If Yes, was the method of randomization described?

Score YES, if the authors describe any method used to generate a random allocation sequence.

Score NO, if the authors do not describe the allocation method or describe methods of allocation such as alternation, case record numbers, dates of birth, day of the week, and any allocation procedure that is entirely transparent before assignment, such as an open list of random numbers of assignments.

If NO is scored, then the study is a controlled clinical trial.

I.5.1 Yes

I.5.2 No

I.6 B3) STUDY DESIGN. If Yes, was the method appropriate?

Score YES, if the randomization sequence allowed each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. Examples of appropriate approaches include assignment of subjects by a central office unaware of subject characteristics, or sequentially numbered, sealed, opaque envelopes.

Score NO, if the randomization sequence is open to the individuals responsible for recruiting and allocating participants or providing the intervention, since those individuals can influence the allocation process, either knowingly or unknowingly.

If NO is scored, then the study is a controlled clinical trial.

I.6.1 Yes

I.6.2 No

I.7 B4) STUDY DESIGN. Rate Section B

Strong: will be assigned to those articles that described RCTs and CCTs.

Moderate: will be assigned to those that described a cohort analytic study, a case control study, a cohort design, or an interrupted time series.

Weak: will be assigned to those that used any other method or did not state the method used.

I.7.1 Strong

I.7.2 Moderate

I.7.3 Weak

I.8 C1) CONFOUNDERS. Were there important differences between groups prior to the intervention?

By definition, a confounder is a variable that is associated with the intervention or exposure and causally related to the outcome of interest.

Even in a robust study design, groups may not be balanced with respect to important variables prior to the intervention.

The authors should indicate if confounders were controlled in the design (by stratification or matching) or in the analysis.

If the allocation to intervention and control groups is randomized, the authors must report that the groups were balanced at baseline with respect to confounders (either in the text or a table).

The following are examples of confounders: Race, Sex, Marital status/family, Age, SES (income or class), Education, Health status, Pre-intervention score on outcome measure.

I.8.1 Yes

I.8.2 No

I.8.3 Can't tell

I.9 C2) CONFOUNDERS. If YES, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

If Yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

I.9.1 80 - 100%

I.9.2 60 - 79%

I.9.3 Less than 60%

I.9.4 Can't tell

I.10 C3) CONFOUNDERS. Rate Section C

Strong: will be assigned to those articles that controlled for at least 80% of relevant confounders (C1 is 2); or (C2 is 1).

Moderate: will be given to those studies that controlled for 60 – 79% of relevant confounders (C1 is 1) and (C2 is 2).

Weak: will be assigned when less than 60% of relevant confounders were controlled (C1 is 1) and (C2 is 3) or control of confounders was not described (C1 is 3) and (C2 is 4).

I.10.1 Strong

I.10.2 Moderate

I.10.3 Weak

I.11 D1) BLINDING. Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?

Assessors should be described as blinded to which participants were in the control and intervention groups.

The purpose of blinding the outcome assessors (who might also be the care providers) is to protect against detection bias.

I.11.1 Yes

I.11.2 No

I.11.3 Can't tell

I.12 D2) BLINDING. Were the study participants aware of the research question?

Study participants should not be aware of (i.e. blinded to) the research question.

The purpose of blinding the participants is to protect against reporting bias.

I.12.1 Yes

I.12.2 No

I.12.3 Can't tell

I.13 D3) BLINDING. Rate Section D

Strong: The outcome assessor is not aware of the intervention status of participants (D1 is 2); and the study participants are not aware of the research question (D2 is 2).

Moderate: The outcome assessor is not aware of the intervention status of participants (D1 is 2); or the study participants are not aware of the research question (D2 is 2); or blinding is not described (D1 is 3 and D2 is 3).

Weak: The outcome assessor is aware of the intervention status of participants (D1 is 1); and the study participants are aware of the research question (D2 is 1).

I.13.1 Strong

I.13.2 Moderate

I.13.3 Weak

I.14 E1) DATA COLLECTION METHODS. Were data collection tools shown to be valid?

Tools for primary outcome measures must be described as reliable and valid. If 'face' validity or 'content' validity has been demonstrated, this is acceptable.

Some sources from which data may be collected are described below:

- Self reported data includes data that is collected from participants in the study (e.g. completing a questionnaire, survey, answering questions during an interview, etc.).

- Assessment/Screening includes objective data that is retrieved by the researchers. (e.g. observations by investigators).

- Medical Records/Vital Statistics refers to the types of formal records used for the extraction of the data.

Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity.

I.14.1 Yes

I.14.2 No

I.14.3 Can't tell

I.15 E2) DATA COLLECTION METHODS. Were data collection tools shown to be reliable?

Yes - The tools are known or were shown to be consistent and accurate in measuring the outcome of interest (e.g., test-retest, Cronbach's alpha, interrater reliability).

No - There was no attempt to show that the tools were consistent and accurate in measuring the outcome of interest.

I.15.1 Yes

I.15.2 No

I.15.3 Can't tell

I.16 E3) DATA COLLECTION METHODS. Rate Section E

Strong: The data collection tools have been shown to be valid (E1 is 1); and the data collection tools have been shown to be reliable (E2 is 1).

Moderate: The data collection tools have been shown to be valid (E1 is 1); and the data collection tools have not been shown to be reliable (E2 is 2) or reliability is not described (E2 is 3).

Weak: The data collection tools have not been shown to be valid (E1 is 2) or both reliability and validity are not described (E1 is 3 and E2 is 3).

I.16.1 Strong

I.16.2 Moderate

I.16.3 Weak

I.17 F1) WITHDRAWALS AND DROP-OUTS. Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

Score YES if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs.

Score NO if either the numbers or reasons for withdrawals and drop-outs are not reported.

I.17.1 Yes

I.17.2 No

I.17.3 Can't tell

I.18 F2) WITHDRAWALS AND DROP-OUTS. Indicate the percentage of participants completing the study.

The percentage of participants completing the study refers to the % of subjects remaining in the study at the final data collection period in all groups (i.e. control and intervention groups).

If the percentage differs by groups, record the lowest.

I.18.1 80 - 100%

I.18.2 60 - 79%

I.18.3 Less than 60%

I.18.4 Can't tell

I.19 F3) WITHDRAWALS AND DROP-OUTS. Rate Section F

Strong: will be assigned when the follow-up rate is 80% or greater (F2 is 1).

Moderate: will be assigned when the follow-up rate is 60 - 79% (F2 is 2) OR F2 is 5 (N/A).

Weak: will be assigned when a follow-up rate is less than 60% (F2 is 3) or if the withdrawals and drop-outs were not described (F2 is 4).

I.19.1 Strong

I.19.2 Moderate

I.19.3 Weak

I.20 G1) INTERVENTION INTEGRITY. What percentage of participants received the allocated intervention or exposure of interest?

The number of participants receiving the intended intervention should be noted (consider both frequency and intensity).

For example, the authors may have reported that at least 80 percent of the participants received the complete intervention.

I.20.1 80 - 100%

I.20.2 60 - 79%

I.20.3 Less than 60%

I.20.4 Can't tell

I.21 G2) INTERVENTION INTEGRITY. Was the consistency of the intervention measured?

The authors should describe a method of measuring if the intervention was provided to all participants the same way.

I.21.1 Yes

I.21.2 No

I.21.3 Can't tell

I.22 G3) INTERVENTION INTEGRITY. Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?

The authors should indicate if subjects received an unintended intervention that may have influenced the outcomes.

For example, co-intervention occurs when the study group receives an additional intervention (other than that intended). In this case, it is possible that the effect of the intervention may be over-estimated.

Contamination refers to situations where the control group accidentally receives the study intervention. This could result in an under-estimation of the impact of the intervention.

I.22.1 Yes

I.22.2 No

I.22.3 Can't tell

I.23 H1) ANALYSES. Indicate the unit of allocation (select one)

Was the quantitative analysis appropriate to the research question being asked?

I.23.1 Community

I.23.2 Organization/institution

I.23.3 Practice/office

I.23.4 Individual

I.24 H2) ANALYSES. Indicate the unit of analysis (check one)

I.24.1 Community

I.24.2 Organization/institution

I.24.3 Practice/office

I.24.4 Individual

I.25 H3) ANALYSES. Are the statistical methods appropriate for the study design?

I.25.1 Yes

I.25.2 No

I.25.3 Can't tell

I.26 H4) ANALYSES. Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

An intention-to-treat analysis is one in which all the participants in a trial are analyzed according to the intervention to which they were allocated, whether they received it or not.

Intention-to-treat analyses are favoured in assessments of effectiveness as they mirror the noncompliance and treatment changes that are likely to occur when the intervention is used in practice, and because of the risk of attrition bias when participants are excluded from the analysis.

I.26.1 Yes

I.26.2 No

I.26.3 Can't tell

I.27 Global rating for this paper

Refer to Sections A to F and select ONE option:

STRONG (four STRONG ratings with no WEAK ratings)

MODERATE (less than four STRONG ratings and one WEAK rating)

WEAK (two or more WEAK ratings)

Also:

- state any disagreements you may have with the authors regarding the conclusions they have reached.;

- add any other comments not made elsewhere.

I.27.1 Strong

I.27.2 Moderate

I.27.3 Weak

I.28 Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

If Yes, indicate the reason for the discrepancy:

- Oversight

- Differences in interpretation of criteria

- Differences in interpretation of study

I.28.1 Yes - Oversight

I.28.2 Yes - Differences in interpretation of criteria

I.28.3 Yes - Differences in interpretation of study

I.28.4 No

I.29 Final decision of both reviewers

Select ONE option.

I.29.1 Strong

I.29.2 Moderate

I.29.3 Weak

Section J: Quality assessment - qualitative studies

Adapted from Critical Appraisal Skills Programme (CASP) "10 questions to help you make sense of qualitative research" -

http://www.phru.nhs.uk/Doc_Links/Qualitative%20Appraisal%20Tool.pdf.

Three broad issues need to be considered when appraising the report of qualitative research:

- Rigour: has a thorough and appropriate approach been applied to key research methods in the study?
- Credibility: are the findings well presented and meaningful?
- Relevance: how useful are the findings to you and your organisation?

The first two questions are screening questions. If the answer to both is "yes", it is worth proceeding with the remaining questions.

Record your reasons for your answers in the spaces provided.

J.1 Was there a clear statement of the aims of the research?

Consider:

- what the goal of the research was

- why it is important

- its relevance

J.1.1 Yes

J.1.2 No

J.2 Is a qualitative methodology appropriate?

Consider:

- if the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants

J.2.1 Yes

J.2.2 No

J.3 Was the research design appropriate to address the aims of the research?

Consider:

- if the researcher has justified the research design (e.g. have they discussed how they decided which methods to use?)

J.3.1 Yes

J.3.2 No

J.4 Was the recruitment strategy appropriate to the aims of the research?

Consider:

- if the researcher has explained how the participants were selected
- if they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
- if there are any discussions around recruitment (e.g. why some people chose not to take part)

J.4.1 Yes

J.4.2 No

J.5 Were the data collected in a way that addressed the research issue?

Consider:

- if the setting for data collection was justified
- if it is clear how data were collected (e.g. focus group, semi-structured interview etc)
- if the researcher has justified the methods chosen
- if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted, did they use a topic guide?)
- if methods were modified during the study. If so, has the researcher explained how and why?
- if the form of data is clear (e.g. tape recordings, video material, notes etc)
- if the researcher has discussed saturation of data

J.5.1 Yes

J.5.2 No

J.6 Has the relationship between researcher and participants been adequately considered?

Consider whether it is clear:

- if the researcher critically examined their own role, potential bias and influence during:
 - formulation of research questions
 - data collection, including sample recruitment and choice of location
 - how the researcher responded to events during the study and whether they considered the implications of any changes in the research design

J.6.1 Yes

J.6.2 No

J.7 Have ethical issues been taken into consideration?

Consider:

- if there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- if the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
- if approval has been sought from the ethics committee

J.7.1 Yes

J.7.2 No

J.8 Was the data analysis sufficiently rigorous?

Consider:

- if there is an in-depth description of the analysis process
- if thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?
- whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process – if sufficient data are presented to support the findings
- to what extent contradictory data are taken into account
- whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

J.8.1 Yes

J.8.2 No

J.9 Is there a clear statement of findings?

Consider:

- if the findings are explicit
- if there is adequate discussion of the evidence both for and against the researcher's arguments

– if the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst.)

– if the findings are discussed in relation to the original research questions

J.9.1 Yes

J.9.2 No

J.10 How valuable is the research?

Consider:

– if the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature?)

– if they identify new areas where research is necessary

– if the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

J.10.1 Please describe

J.11 How many of questions 1-9 (i.e. ignoring 10) received the answer 'Yes'?

Enter only a single number.

J.11.1 Enter number of 'Yes' answers

J.12 Global rating for this paper

Select ONE option.

Also:

- state any disagreements you may have with the authors regarding the conclusions they have reached.;

- add any other comments not made elsewhere.

J.12.1 Strong

J.12.2 Moderate

J.12.3 Weak

J.13 Is there a discrepancy between the two reviewers with respect to the component ratings?

If Yes, indicate the reason for the discrepancy:

- Oversight

- Differences in interpretation of criteria

- Differences in interpretation of study

J.13.1 Yes - Oversight

J.13.2 Yes - Differences in interpretation of criteria

J.13.3 Yes - Differences in interpretation of study

J.13.4 No

J.14 Final decision of both reviewers

Select ONE option.

J.14.1 Strong

J.14.2 Moderate

J.14.3 Weak

Section K: Quality assessment - economic evaluations

Based on Drummond et al's 10-point checklist in 'Methods for the Economic Evaluation of health care Programmes', 3rd Edition, Oxford University Press, 2005, pp.28-9.

Most of the following questions require Yes/No answers. Please give a brief explanation/justification next to each answer.

K.1 Was a well-defined question posed in answerable form?

Consider:

1.1. Did the study examine both costs and effects of the service(s) or programme(s)?

1.2. Did the study involve a comparison of alternatives?

1.3. Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?

K.1.1 Yes

K.1.2 No

K.1.3 Can't tell

K.2 Was a comprehensive description of the competing alternatives given (i.e. can you tell who did what to whom, where, and how often)?

Consider:

2.1. Were any relevant alternatives omitted?

2.2. Was (should) a do-nothing alternative (be) considered?

K.2.1 Yes

K.2.2 No

K.2.3 Can't tell

K.3 Was the effectiveness of the programme or services established?

Consider:

3.1. Was this done through a randomised, controlled clinical trial? If so, did the trial protocol reflect what would happen in regular practice?

3.2. Were effectiveness data collected and summarized through a systemic overview of clinical studies? If so, were the search strategy and rules for inclusion or exclusion outlined?

3.3. Were observational data or assumptions used to establish effectiveness? If so, what are the potential biases in results?

K.3.1 Yes

K.3.2 No

K.3.3 Can't tell

K.4 Were all the important and relevant costs and consequences for each alternative identified?

Consider:

4.1. Was the range wide enough for the research question at hand?

4.2. Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of patients and third-party payers. Other viewpoints may also be relevant depending upon the particular analysis.)

4.3. Were capital costs, as well as operating costs, included?

K.4.1 Yes

K.4.2 No

K.4.3 Can't tell

K.5 Were costs and consequences measured accurately in appropriate physical units (e.g. hours of nursing time, number of physician visits, lost work-days, gained life years)?

Consider:

5.1. Were the sources of resource utilization described and justified?

5.2. Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?

5.3. Were there any special circumstances (e.g., joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?

K.5.1 Yes

K.5.2 No

K.5.3 Can't tell

K.6 Were costs and consequences valued credibly?

Consider:

6.1. Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy-makers' views and health professionals' judgements)

6.2. Were market values employed for changes involving resources gained or depleted?

6.3. Where market values were absent (e.g. volunteer labour), or market values did not reflect actual values (such as clinic space donated at a reduced rate), were adjustments made to approximate market values?

6.4. Was the valuation of consequences appropriate for the question posed (i.e. has the appropriate type or types of analysis – cost-effectiveness, cost-benefit, cost-utility – been selected)?

K.6.1 Yes

K.6.2 No

K.6.3 Can't tell

K.7 Were costs and consequences adjusted for differential timing?

Consider:

7.1. Were costs and consequences that occur in the future 'discounted' to their present values?

7.2. Was any justification given for the discount rate used?

K.7.1 Yes

K.7.2 No

K.7.3 Can't tell

K.8 Was an incremental analysis of costs and consequences of alternatives performed?

Consider:

8.1. Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits, or utilities generated?

K.8.1 Yes

K.8.2 No

K.8.3 Can't tell

K.9 Was allowance made for uncertainty in the estimates of costs and consequences?

Consider:

9.1. If patient-level data on costs and consequences were available, were appropriate statistical analyses performed?

9.2. If a sensitivity analysis was employed, was justification provided for the ranges or distributions of values (for key study parameters), and the form of sensitivity analysis used?

9.3. Were the conclusions of the study sensitive to the uncertainty in the results, as quantified by the statistical and/or sensitivity analysis?

K.9.1 Yes

K.9.2 No

K.9.3 Can't tell

K.10 Did the presentation and discussion of study results include all issues of concern to users?

Consider:

10.1. Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (e.g. cost-effectiveness ratio)? If so, was the index interpreted intelligently or in a mechanistic fashion?

10.2. Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential differences in study methodology?

10.3. Did the study discuss the generalisability of the results to other settings and patient/client groups?

10.4. Did the study allude to, or take account of, other important factors in the choice or decision under consideration (e.g. distribution of costs and consequences, or relevant ethical issues)?

10.5. Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programmes?

K.10.1 Yes

K.10.2 No

K.10.3 Can't tell

K.11 How many of questions 1-10 received the answer 'Yes'?

Enter only a single number.

K.11.1 Enter number of 'Yes' answers

K.12 Global rating for this paper

Select ONE option.

Also:

- state any disagreements you may have with the authors regarding the conclusions they have reached;

- add any other comments not made elsewhere.

K.12.1 Strong

K.12.2 Moderate

K.12.3 Weak

K.13 Is there a discrepancy between the two reviewers with respect to the component ratings?

If Yes, indicate the reason for the discrepancy:

- Oversight

- Differences in interpretation of criteria

- Differences in interpretation of study

- K.13.1 Yes - Oversight
- K.13.2 Yes - Differences in interpretation of criteria
- K.13.3 Yes - Differences in interpretation of study
- K.13.4 No
- K.14 Final decision of both reviewers
- Select ONE option.
- K.14.1 Strong
- K.14.2 Moderate
- K.14.3 Weak

Addendum

This document is an output from a research project that was commissioned by the Service Delivery and Organisation (SDO) programme whilst it was managed by the National Coordinating Centre for the Service Delivery and Organisation (NCCSDO) at the London School of Hygiene & Tropical Medicine. The NIHR SDO programme is now managed by the National Institute for Health Research Evaluations, Trials and Studies Coordinating Centre (NETSCC) based at the University of Southampton.

Although NETSCC, SDO has managed the project and conducted the editorial review of this document, we had no involvement in the commissioning, and therefore may not be able to comment on the background of this document. Should you have any queries please contact sdo@southampton.ac.uk.