BMJ Open

Barriers and facilitators to implementation of non-medical independent prescribing in primary care in the UK: a qualitative systematic review

Judith Edwards ![ORCID],[1] Melaine Coward,[1] Nicola Carey[2]

[1]School of Health Sciences, University of Surrey Faculty of Health and Medical Sciences, Guildford, UK
[2]Department of Nursing and Midwifery, University of the Highlands and Islands, Inverness, UK

Correspondence to
Judith Edwards;
j.a.edwards@surrey.ac.uk

ABSTRACT

Objectives To support workforce deficits and rising demand for medicines, independent prescribing (IP) by nurses, pharmacists and allied health professionals is a key component of workforce transformation in UK healthcare. This systematic review of qualitative research studies used a thematic synthesis approach to explore stakeholders' views on IP in primary care and identify barriers and facilitators influencing implementation.

Setting UK primary/community care.

Participants Inclusion criteria were UK qualitative studies of any design, published in the English language. Six electronic databases were searched between January 2010 and September 2021, supplemented by reference list searching. Papers were screened, selected and quality-appraised using the Quality Assessment Tool for Studies with Diverse Designs. Study data were extracted to a bespoke table and two reviewers used NVivo software to code study findings. An inductive thematic synthesis was undertaken to identify descriptive themes and interpret these into higher order analytical themes. The Diffusion of Innovations and Consolidated Framework for Implementation Research were guiding theoretical anchors.

Primary and secondary outcome measures N/A.

Results Twenty-three articles addressing nurse, pharmacist and physiotherapist IP were included. Synthesis identified barriers and facilitators in four key stages of implementation: (1) 'Preparation', (2) 'Training', (3) 'Transition' and 4) 'Sustainment'. Enhancement, substitution and role-specific implementation models reflected three main ways that the IP role was used in primary care.

Conclusions In order to address global deficits, there is increasing need to optimise use of IP capability. Although the number of independent prescribers continues to grow, numerous barriers to implementation persist. A more coordinated and targeted approach is key to overcoming barriers identified in the four stages of implementation and would help ensure that IP is recognised as an effective approach to help alleviate workforce shortfalls in the UK, and around the world.

PROSPERO registration number CRD42019124400.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Adopting a qualitative synthesis facilitated contextual understanding into the implementation of non-medical independent prescribing (IP) in primary care settings in the UK.
⇒ Higher order analytical themes were identified that offer in-depth interpretation of non-medical IP implementation in UK primary care.
⇒ The theoretical lens improved understanding of the generalisability of factors known to facilitate non-medical IP in UK primary care.
⇒ Grey literature was excluded from the synthesis.

INTRODUCTION

Equitable access to primary care improves health outcomes, lowers costs and enhances patient experience.[1 2] Global workforce deficits[3–5] and the rising prevalence of long-term conditions,[6 7] multimorbidity[8–10] and COVID-19[11] have severely threatened primary care sustainability.[12–15] Medicines use in global priorities including diabetes and cardiovascular diseases is increasing, with worldwide drug therapy days rising in 2019 to 1.8 trillion and an average of 234 days per person/year.[16] With one in four adults in UK primary care taking five or more medicines daily,[17] the workforce implications for meeting prescribing needs are profound.

Mobilising primary care to improve workforce and service sustainability is a global challenge.[5 18] As in other countries,[19 20] primary care in the four devolved UK nations (ie, England, Scotland, Wales and Northern Ireland) has undergone significant restructuring and reorganisation.[21–24] In England, for example, the 2019 National Health Service (NHS) long-term plan amalgamated general practitioner (GP) practices into primary care networks (PCN), covering populations of 30 000–50 000.[25] Pooling resources to achieve government targets[26] with the promise of extra non-medical staff

(eg, advanced/specialist clinical pharmacists, dieticians, paramedics and physiotherapists), PCNs were expected to offer additional hours within broader service options.[27] While the impact of the new 2021/2022 Health and Care Bill on primary care workforce transformation in England remains uncertain,[28] the diverse skills of the non-medical advanced practice workforce including prescribing capability are likely to remain important for addressing UK primary care prescribing and medicines optimisation needs.[29–31]

In line with global movements to enhance the skills of non-medical healthcare professionals, over 90 000 UK nurses, pharmacists, optometrists, radiographers, physiotherapists, podiatrists, dieticians and paramedics[32] under serial legislative changes[33–36] and with accredited additional training[37–39] are authorised to prescribe using supplementary and/or independent forms. Although UK legislation restricts dieticians and diagnostic radiographers to supplementary prescribing, as reported by professions with dual supplementary/independent prescribing (IP) rights (eg, nurses, pharmacists, physiotherapists, podiatrists) IP is more workable[40 41] and has largely superseded supplementary prescribing in many UK non-doctor led primary and community care services.[42–44] Enabling the autonomous initial assessment and ongoing management of patient prescribing and medicines optimisation needs, IP increases practitioner autonomy/expertise,[29 45–47] enhances clinical outcomes compared with doctor-led care[29] and results in high service-user satisfaction.[48] Across contemporary primary care settings in the UK and internationally IP is an increasingly essential component of service re-design.[45 49–54]

Despite its many benefits, the UK adoption rates for IP vary,[55 56] with medical opposition to prescribing roles,[57 58] training course drop-out,[46] delayed prescribing onset[59 60] and role underuse reported.[61–64] Difficulties with implementation are frequently cited.[43 46 59 65–67] Several UK[68 69] and international systematic[54 70–72] and literature reviews,[73 74] have focused on implementation barriers and/or facilitators. However, these have been profession-specific,[54 70–72 74] have included international models with varying legislative/jurisdictional levels of prescribing autonomy[54 70–72] and/or have addressed prescribing in heterogenous care settings.[54 68 69 74] None have synthesised qualitative studies in all IP eligible professions in UK primary care. Considering IP enhances workforce skills and builds capacity for service redesign and improved sustainability,[42 75–77] identifying and understanding the challenges to its implementation is ever pressing.[78 79]

Aim

This qualitative meta-synthesis aimed to identify barriers and facilitators that influence implementation of IP in UK primary care.

Theoretical perspective

This review is broadly informed by the Diffusion of Innovations theory[80 81] and the Consolidated Framework for Implementation Research[82 83] which provided theoretical anchors for identifying contextual factors likely to influence implementation.[84–89]

METHODS

This qualitative meta-synthesis is reported following the Enhancing transparency in reporting the synthesis of qualitative research (ENTREQ) guidelines[90] which incorporates elements of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[91] Thematic qualitative meta-synthesis[92 93] permits synthesis of context-embodied research and is a suitable method for identifying factors influencing implementation.[94–96] The review was registered in PROSPERO.[97]

Search strategy

A systematic search of UK literature on primary and community care IP was undertaken in January 2021 and updated in September 2021. Barriers/facilitators to healthcare innovations are conceptually well established[98–102] and thus grey literature was excluded. Search terms were developed according to the Sample, Phenomenon of Interest, Design, Evaluation, Research Type (SPIDER) tool[103] and tested based on truncations of words related to prescribing, community/primary care and UK non-medical healthcare professions with IP authority (eg, nurses, pharmacists, optometrists, physiotherapists, podiatrists, paramedics and radiographers). Wild card and Boolean Search Operators were used. Qualitative search terms were not included[104 105]; all citations were screened for qualitative methodology. Search strings (see online supplemental file 1 examples) were adapted for six electronic databases (EBSCO - MEDLINE, CINAHL, OVID – Embase, ProQuest - British Nursing Index, Nursing & Allied Health, Web of Science). The 2010 inception search date reflected major UK coalition governmental change and the introduction of landmark legislative reforms[106–109] that decentralised UK primary/community care commissioning.[110] Inclusion criteria applied to study selection are shown in table 1. Retrieved citations were downloaded to EndNote V.X9 and duplicates removed.

Screening and eligibility

Two reviewers (JE and NC) independently assessed all titles and abstracts against the inclusion criteria and the full-text versions of papers deemed potentially relevant were obtained and reviewed. Papers found not to meet the criteria during screening were excluded with reasons recorded as shown in the PRISMA table (figure 1). Reference list hand searching supplemented database searching.

Quality assessment

In keeping with the scope of a qualitative meta-synthesis,[111 112] studies were not excluded on the basis of quality assessment.[92 113] Methodological appraisal of individual papers was undertaken using the Quality

Table 1 Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
▶ Primary research conducted in the UK (England, Scotland, Northern Ireland and/or Wales).	▶ International/UK literature reviews, meta-analyses or meta-synthesis and/or grey literature.
▶ Studies employing participatory and/or non-participatory data collection methods within any qualitative, quantitative or mixed methods design.	▶ Quantitative studies not employing qualitative data collection methods.
▶ Studies addressing IP by legislated non-doctor healthcare professionals.	▶ Studies addressing supplementary, dependent and/or collaborative models of prescribing.
▶ Studies addressing primary/community care IP.	▶ Studies addressing secondary care and/or mixed primary and secondary care IP.
▶ Studies presenting empirical evidence of barriers and/or facilitators to IP implementation.	
▶ Studies addressing non-context specific educational programmes for non-medical IP.	
▶ Peer reviewed, full-text articles published between 01 January 2010 and 30 September 2021 in the English language.	
IP, independent prescribing.	

Assessment Tool for Studies with Diverse Designs (QATSDD),[114] which has demonstrated validity and test–retest reliability for assessing the reporting and methodological transparency of diverse study designs.[115] The tool uses a 4-point scoring system for assessment of qualitative studies (14 questions) and mixed methods studies (16 questions), resulting in total possible scores of 42 and 48, respectively.[114] Scoring was undertaken by one reviewer (JE) and any uncertainties were discussed and resolved with a second reviewer (NC). Online supplemental file 2 provides a detailed breakdown of questions and the grading of study manuscripts.

Data extraction

Study data were extracted by one author (JE) to a bespoke table adapted from recommended templates.[116] This collated contextual and methodological information, data on barriers and/or facilitators and main findings and was piloted on five index studies to ensure consistency and usability. Data extraction was recursive and involved repeated review/update between ensuing analysis stages.[117]

Data analysis and synthesis

The aim of thematic analysis was to develop a coherent synthesis of barriers and facilitators that influenced IP across stages of the implementation continuum.[118–120] Data analysis followed a four stage, iterative process described by Thomas and Harden[121] (table 2). Qualitative 'data' referred to participant quotations, (sub) themes, explanations, hypotheses or new theory, observational excerpts and author interpretations.[122] Barriers were defined as 'any obstacle (material or immaterial) impeding adoption, implementation and/or sustainability of IP'[123 124] and facilitators were defined as 'any

obstacle (material or immaterial) enhancing adoption, implementation and/or sustainability of IP'.[123 124]

Rigour within the analytical process

To ensure analytical rigour, two independent reviewers (JE and NC) initially performed inductive line-by-line data coding from five highest quality index papers (stage 2). Each reviewer produced sets of open data codes which were compared and discussed. If different codes and/or different interpretations were assigned to a concept, these were discussed and revised. Disagreements were resolved by a third reviewer (MC). Data codes were subsequently grouped into descriptive themes, creating a codebook for application to all papers (stage 3). To identify possible contradictory cases and clarify thematic commonalities within studies,[125] a matrix of participant quotes was charted to constituent themes (see online supplemental file 3).[126]

Patient and public involvement

The review was conducted as part of a PhD exploring paramedic IP in UK primary care, for which a University service user/carers group was instrumental in informing study design and methods. However, as the systematic review focused on implementation challenges and not patient-related outcomes, the group was not involved in design or conduct.

RESULTS

Out of 5365 original articles identified 23 met inclusion criteria[127–150] (see figure 1, PRISMA table).

Study characteristics and quality assessment

Table 3 summaries the study characteristics and quality assessment scores of included articles. Studies were undertaken
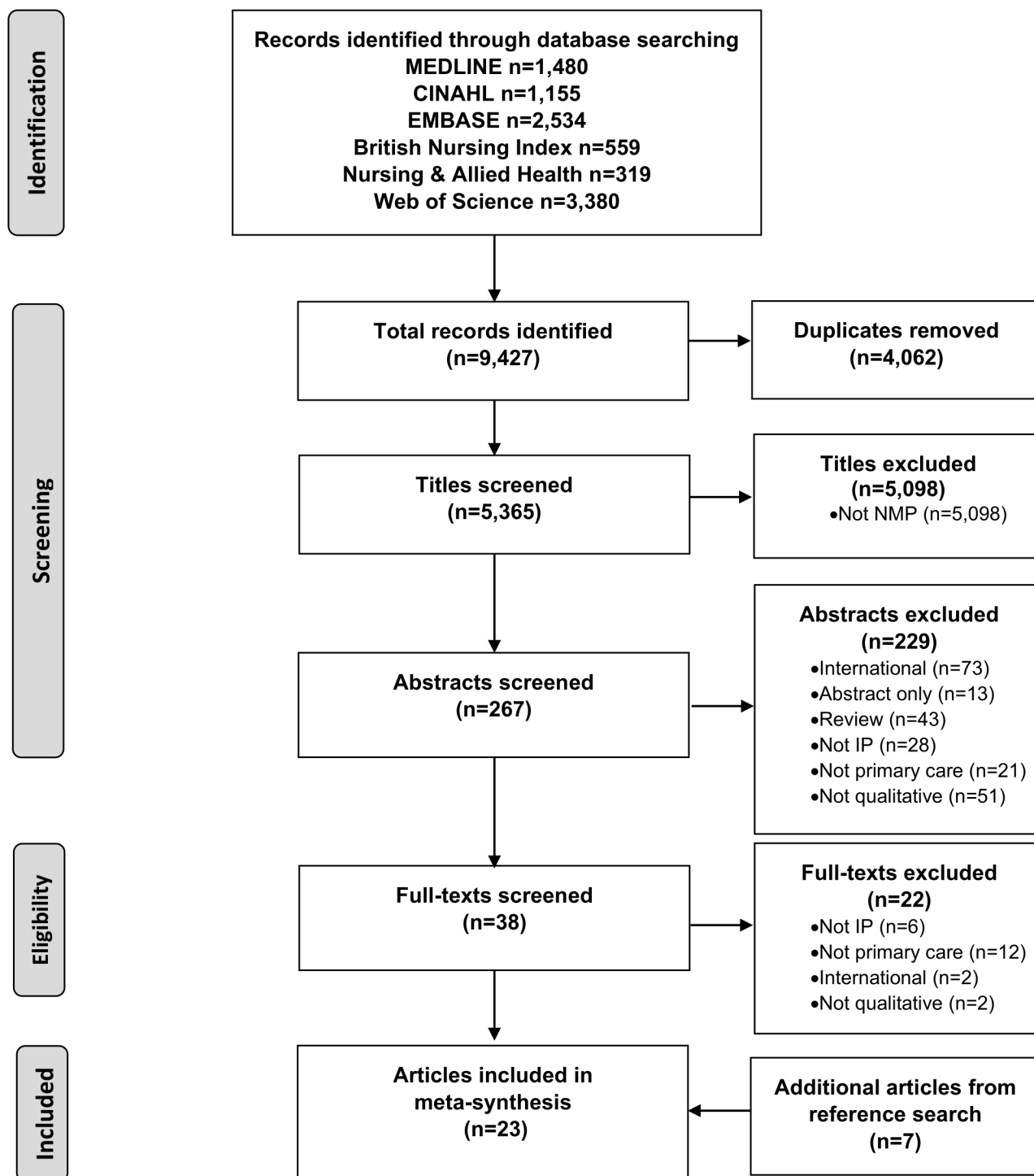
Identification

Records identified through database searching
MEDLINE n=1,480
CINAHL n=1,155
EMBASE n=2,534
British Nursing Index n=559
Nursing & Allied Health n=319
Web of Science n=3,380

Screening

Total records identified
(n=9,427) → **Duplicates removed**
(n=4,062)

Titles screened
(n=5,365) → **Titles excluded**
(n=5,098)
•Not NMP (n=5,098)

Abstracts screened
(n=267) → **Abstracts excluded**
(n=229)
•International (n=73)
•Abstract only (n=13)
•Review (n=43)
•Not IP (n=28)
•Not primary care (n=21)
•Not qualitative (n=51)

Eligibility

Full-texts screened
(n=38) → **Full-texts excluded**
(n=22)
•Not IP (n=6)
•Not primary care (n=12)
•International (n=2)
•Not qualitative (n=2)

Included

Articles included in
meta-synthesis
(n=23) ← **Additional articles from**
reference search
(n=7)

Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses depicting study selection, screening, eligibility for inclusion and synthesis (adapted from Page *et al*).[91] IP, independent prescribing; NMP, non-medical prescribing.

in England,[129 132 133 136 138 140 141 143 146–150] Scotland[127 128 130 139] or across devolved UK nations.[131 134 135 142 144] The representation of independent prescribers from Wales[131 134] and Northern Ireland[142 144] was limited. Sixteen studies used qualitative methods,[127 130 131 133 135–140 144–150] six used mixed methods[128 129 132 134 141 142] and one employed a qualitative survey.[143]

Fifteen studies addressed nurse IP,[127–129 132–134 136–140 143 146 148 150] seven included pharmacists[130 131 135 142 144 147 149] and one study focused on physiotherapists.[141] Where indicated, studies were conducted pre-2011,[128 129 133 137–139 143 147–149] between 2011–2015[127 130 132 134 145 146 150] or between 2016–2019.[131 135 142 144] All studies reported results from primary care IP implementation; in general practice,[136–138 143] community domiciliary/residential care[132 139 140 142 144 146 150] or mixed general practice/community settings.[127–131 133–135 141 147 148] Participants included

Table 2	Stages of analysis
Stage 1	In-depth reading and familiarisation with individual papers, data extraction.
Stage 2	Inductive line-by-line coding of highest quality, index papers (n=5) to develop a set of 'open codes' by two independent reviewers (JE and NC).
Stage 3	Codes discussed/agreed, grouped into descriptive themes using NVivo[189]; codebook applied to all papers, and expanded/modified by identifying new codes/themes and/or merging/renaming existing codes/themes.[190]
Stage 4	Descriptive themes organised into higher order analytical themes and matrix charted with corresponding indicative quotes.

nurse/pharmacist prescribers,[130 132 134–137 139 140 146 147 149 150] nurse/physiotherapist non-prescribers,[141 143] nurse non-medical prescriber trainees and educational staff,[127–129] service-users[133 134 138 148] and multidisciplinary team members.[142 144 149 150] Studies explored training,[127–129] IP roles,[130 136 137 139 146 149] patient acceptance,[133 138 148] prescribing/medicines optimisation practices,[131 132 134 140 141 150] implementation feasibility[142] and barriers and/or facilitators.[135 143 144 147]

The methodological quality of included studies (see table 3 summary) was average, with a QATSDD mean score 25 (range 13–36), mainly due to seven low scoring studies.[130 132 137–140 143] Common methodological weaknesses were: lack of explicit theoretical framework,[130 132 137 138 140 143] limited/absent rationale for choice of analytical methods[130 132 137–140 143] and lack of reliability assessment for analytical processes.[130 132 137–140 143] Methodological strengths of higher scoring studies were: statement of aims/objectives in main body of report,[128 131 134 135 141 145 150] description of data collection procedures[128 131 135 141 144 145 147] and fit between research question and method of analysis.[128 134 135 141 144 145 147 150] Notably studies providing richer contextual descriptions,[131 135 144 146 147 150] and/or using implementation theory[135 144] explored barriers and/or facilitators in greater depth.

Identification of barriers and facilitators and key stages of implementation

Implementation of IP in primary care was found to be complex and influenced by a myriad of organisational service, team and individual stakeholder level barriers and facilitators. Informed by descriptive/data themes, these fell into four major analytical themes, each of which is presented as a key stage in the implementation process as follows:

1. Analytical theme 1: Preparation—organisational readiness for implementation
2. Analytical theme 2: Training—optimising practitioner readiness for IP
3. Analytical theme 3: Transition—ensuring early prescribing support

4. Analytical theme 4: Sustainment—maximising and developing IP.

Table 4 provides an overview of analytical themes, associated descriptive/data themes and summative findings. Examples of indicative quotations making up these themes are presented in online supplemental file 3. Factors presented within themes acted as barriers and/or facilitators to implementation, for example, poor managerial support was a barrier, while proactive managerial support and leadership facilitated implementation. It is acknowledged that barriers and facilitators overlap some themes and in some cases are interdependent. For example, lack of mentoring relationships with doctors limited opportunity for informal support, which in turn prevented prescribing competence development and risked loss of prescriber confidence.[140 147] Therefore, to avoid duplication of findings, barriers and facilitators are presented within the themes deemed most appropriate, yet their presence and influence is acknowledged elsewhere. Given that the majority of data were derived from studies conducted in England or mixed geographical settings, it was not possible to deduce differences in barriers and facilitators across the devolved UK nations.

Analytical theme 1: preparation—organisational readiness for implementation

This analytical theme refers to barriers and facilitators influential to the planning phase of implementation which related to the service need and relative advantage of implementing IP, the need for consistent managerial leadership and an interprofessional environment that was conducive to team implementation.

Descriptive theme 1.1: clarifying need and advantage of implementing independent prescribing

Identifying shortfalls in existing medicines pathways and how IP could fill service gaps were key steps in this stage. Studies described a highly qualified, specialist nursing and pharmacy workforce delivering unscheduled, scheduled and out-of-hours services[130 132–137 139 140 142 144 146 148–150] who routinely made autonomous clinical decisions necessitating prescribing and medicines optimisation skills.[127 133–135 140 146 148 150] IP held tangible advantage over former methods of accessing prescribed medicines which involved request, referral and/or the counter-signing of prescriptions by doctors. Subject to GP workload[132 142 144] and constrained availability,[140 142 144 146] these methods were labour intensive,[140–142 144 146] inefficient[136 140 141 146] and burdened services and patients through the need for additional healthcare contacts.[133 137 139 141 142 146 148] By removing the need for doctor input, IP improved responsiveness with respect to medicines,[133 135 139 140 142 144 146 148] enhanced care quality[130 142 146] and helped prevent adverse outcomes.[140]

Lack of team clarity and transparency on IP role intentions were persistent barriers to implementation.[137 139 140 142 144 146 147 149] Poor team understanding of IP could limit integration,[149] and promote role ambiguity[149]

Table 3 Characteristics of included studies (n=23) and key barriers and facilitators

Author(s), year	Country, setting	Study focus, participants	Barriers	Facilitators	QATSDD score
Afseth and Paterson (2017)[127]	Scotland. HEI.	Views on prescribing training. 6 NIP trainees, 6 DMPs.	1, 2, 3	4, 5, 6, 7, 8	67%
Boreham et al (2013)[128]	Scotland.	Views on prescribing training. 87 NIP trainees, 10 HEI leads.	1, 2, 3, 8, 9	4, 5, 9, 10, 11	67%
Bowskill et al (2014)[129]	England. HEI.	Views on prescribing training 6 IP trainees, 3 IPs (unspecified professions).	1, 3, 9	12	60%
Brodie et al (2014)[130]	Scotland. Gen-P, Comm.	Views on prescribing role. 4 NIPs, 4 PIPs.	8, 13, 14, 15, 16, 17, 18, 19	9, 10, 20, 21, 22, 23, 24	38%
Carter et al (2021)[131]	England, Scotland, Wales. Gen-P, Comm pharmacy.	Factors influencing prescribing and role of practice pharmacists on evidence based prescribing. 6 GPs, 6 NIPs, 6 PIPs, 12 key informants.	25, 26, 27	9, 11, 24, 28, 29, 30, 31, 32, 61	78%
Cole and Gillett (2015)[132]	England. Comm pall care.	Prescribing practices. 6 NIPs.	2, 3, 15, 26, 27, 33, 34, 35, 36, 37, 38	21, 28, 30, 37, 61	29%
Courtenay et al (2010)[133]	England. Gen-P, Comm clinics.	Patient experiences/views of nurse prescribing. 41 patients.		10, 11, 22, 39	50%
Courtenay et al (2017)[134]	England, Scotland, Wales. Gen-P, Comm clinics.	Patient experiences/views of nurse and pharmacist antibiotic prescribing for respiratory tract infection. 16 NIPs, 1 PIP, 22 patients.	27	22, 23, 39, 40, 41	67%
Courtenay et al (2019)[135]	UK (unspecified countries). Gene-P, OOH, IC.	Factors influencing antibiotic prescribing for respiratory tract infection. 17 NIPs, 4 PIPs.	18, 27, 38, 42, 43	6, 10, 11, 22, 23, 24, 28, 29, 32, 39, 40, 41, 44, 57	78%
Cousins and Donnell (2012)[136]	England. Gen-P.	Views on prescribing role. 6 NIPs.	3, 16, 18, 27, 34, 35, 37, 42, 45	6, 9, 10, 20, 24, 28, 61	59%
Daughtry and Hayter (2010)[137]	England. Gen-P.	Experiences of prescribing role. 8 practice NIPs.	3, 6, 18, 27, 29, 35, 62	5, 8, 9, 10, 11, 24, 28, 29, 30, 44, 46, 47, 57, 61	36%
Dhalivaal et al (2011)[138]	England. Gen-P.	Patient views on nurse prescribing. 15 patients.		22, 39	43%
Downer and Shepherd (2010)[139]	Scotland. Comm.	Views on prescribing role. 8 district NIPs.	3, 15, 17, 18, 35, 37, 38, 45, 48, 49, 62	3, 9, 10, 30, 44, 57, 61	48%
Herklots et al (2015)[140]	England. Comm.	Experiences of prescribing. 7 community matron IPs.	3, 15, 16, 18, 35, 38, 48, 49, 62	6, 7, 10, 11, 12, 22, 29, 47, 57, 61	43%
Holden et al (2019)[141]	England.	Medicines optimisation practices. 20 physio non-IPs, 1 physio-IP.	3, 13, 36, 42, 45, 50, 51	10, 21	75%

Continued

Table 3 Continued

Author(s), year	Country, setting	Study focus, participants	Barriers	Facilitators	QATSDD score
Inch et al (2019)[142]	England, Scotland, Northern Ireland. Elderly residential care.	Feasibility of implementation. 2 P non-IPs, 4 PIPs, 6 GPs, 16 care home staff, 2 patients, 3 relatives, 1 dietician non-IP.	3, 49	10, 21, 22, 23, 52	54%
Kelly et al (2010)[143]	England. Gen-P.	Barriers to adoption of IP. 31 practice NIPs, 120 N non-IPs.	1, 2, 3, 9, 13, 35, 36, 42, 45, 50, 51, 53, 54, 55		33%
Lane et al (2020)[144]	England, Scotland, Northern Ireland. Elderly residential care	Barriers and facilitators to prescribing. 27 P non-IPs, 29 GPs, 12 care home staff, 7 patients, 7 relatives.	3, 35, 43, 48, 49	6, 7, 8, 10, 11, 21, 22, 39, 46, 52, 56	78%
Latham and Nyatanga (2018a,b)[145 146]	England. Comm pall care.	Views on prescribing role. 6 NIPs.	3, 15, 18, 27, 35, 36, 38, 49, 50, 60	7, 8, 10, 11, 12, 20, 21, 22, 30, 44, 52, 57, 61	71%
Maddox et al (2016)[147]	England. Gen-P, Comm, Nursing homes, Comm pharmacy.	Barriers and facilitators to prescribing. 25 NIPs, 5 PIPs.	3, 15, 16, 26, 27, 29, 35, 37, 42, 48, 62	6, 7, 10, 12, 24, 29, 30, 42, 47, 57, 61	71%
Stenner et al (2011)[148]	England. Gen-P, Comm clinics.	Patient views on nurse prescribing. 41 patients.		11, 22, 23, 29, 39	55%
Weiss et al (2016)[149]	England. Gen-P.	Views on prescribing role. 7 NIPs, 7 PIPs, 7 GPs.	3, 6, 17, 25, 35, 45, 49, 51, 56, 58, 59, 63	3, 6, 8, 11, 12, 22, 24, 29, 39, 44, 46, 47, 63	52%
Williams et al (2018)[150]	England. OOH/unscheduled care.	Factors influencing nurse and GP antibiotic prescribing for respiratory tract infection. 15 NIPs, 15 GPs.	15, 16, 18, 26, 27, 34, 49, 59	6, 12, 22, 23, 24, 28, 32, 41	76%

Barriers: 1=Lack of backfill/protected/study time, 2=Lack of DMP role clarity/supervision/availability, 3=Lack of medical/managerial support/leadership, 14=Lack of national IP incentives/policy initiatives, 15=Lack of clinical record/IT access, 16=Lack of CPD/supervision, 17=IP role isolation, 18=Time/workload constraints, 19=Lack of IP strategy, 25=Lack of interprofessional collaboration/communication networks, 26=Unclear/absent clinical protocols/guidelines, 27=Inappropriate patient/team pressure for prescribing, 33=Lack of local policies for IP, 34=Lack of governance/accountability structures, 35=Lack of team understanding of IP, 36=Lack of clinical/service advantage of IP, 37=Lack of peer support/mentoring, 38=Lack of prescribing confidence/competence, 42=Fear of responsibility/accountability/error, 43=Lack of practitioner specialist skills, 45=Lack of professional/personal adoption incentive, 48=Poor/absent physician relationships, 49=Lack of IP role clarity, 50=Expedient medicines pathways, 51=Prescribing considered outside professional practice scope, 53=Lack of course information, 54=Inconsistent selection policies, 55=Lack of workforce planning, 58=Formulary restrictions, 59=Lack of service user acceptance, 60=Delayed registration post qualification, 62=Lack of medical supervision, 63=Employment model.
Facilitators: 4=DMP role clarity/good DMP supervision, 5=Interprofessional training model, 6=IP role clarity, 7=Established physician relationships, 8=Medical/managerial support/leadership, 9=Professional/personal adoption incentive, 10=Clinical/service advantage of IP, 11=Interprofessional collaboration/communication networks, 12=Peer support/mentoring, 13=Lack of course funding, 20=Prescribing integral to advanced practice, 21=Identified service pathways gaps, 22=Practitioner specialist skills, 23=Consultation time, 24=CPD/supervision, 28=Clinical/professional protocols/guidelines, 29=Prescribing confidence/competence, 30=Exposure to prescribing opportunity, 31=Adequate formulary, 32=National incentives/policy initiatives for prescribing, 39=Service user acceptance of IP, 40=Governance/accountability structures, 41=Audit/feedback on prescribing practice, 44=Good interprofessional relationships, 46=Stakeholder consultation, 47=Team understanding of IP, 52=Clinical record/IT access, 56=Employment model, 57=Medical supervision, 61=Delineated scope of prescribing competence.
Comm, community; CPD, continued professional development; DMPs, designated medical practitioners; Gen-P, general practice; GPs, general practitioners; HEI, higher educational institute; IC, integrated care; IP, independent prescribing; IT, information technology; NIP, nurse IP; N non-IPs, nurse non-IPs; OOH, out of hours; pall, palliative; physio-IP, physiotherapist IP; physio non-IPs, physiotherapist non-IP; PIPs, pharmacist IP; QATSDD, Quality Assessment Tool for Studies with Diverse Designs.

Table 4 Analytical themes and subthemes from included studies, with summative findings

Analytical theme	Descriptive theme	Data theme	Summative findings
Analytical theme 1: Preparation—organisational readiness for implementation	Theme 1.1: Clarifying need and advantage of independent prescribing	Clarifying clinical/service need for independent prescribing	▶ Establishing a clear service/clinical need for IP[128 133 135–137 139 147] and identifying existing gaps in medicines pathways was a key requisite and facilitator for adoption.[130 132 141 142 144 146] ▶ Team clarity on the need for adoption cemented IP role intentions and avoided role dissonance following implementation.[137 140 142 144 147 149] ▶ Managerial leadership/support for IP was essential for ensuring initial and on-going infrastructural, funding and other implementation support needs.[127–130 132 136 137 139–142 144 146] ▶ Trusting interprofessional relationships, collaboration/team-working built confidence in IP and facilitated team support for implementation.[127 128 131 133 135 137 139 140 144 146 147 149]
		Establishing service pathway gaps	
		Role clarity	
	Theme 1.2: Managerial leadership and support	Role of managers	
		Recognising value	
		Culture	
	Theme 1.3: Interprofessional environment	Inter-professional relationships	
		Communication & collaboration	
Analytical theme 2: Training—optimising practitioner readiness for independent prescribing	Theme 2.1: Selecting the right practitioners	Selection	▶ Adoption was impeded by inconsistent candidate selection policies and lack of workforce planning.[141 143] Individual practitioner expectation of professional/personal benefit remained a key driver for IP adoption.[128 130 131 136 137 139] ▶ Skills requisite to IP (eg, physical assessment and communication skills) were important factors influencing service user and team acceptance of IP.[133 134 138 142 144 146 148–150] ▶ Motivational barriers (eg, lack of remuneration, fear of litigation and competing professional or personal commitments) disincentivised training uptake.[136 141 143]
		Skills and aptitudes	
		Motivation and commitment	
	Theme 2.2: Preparing and supporting practitioners during training	Expectations of training	▶ Lack of information on NMP training and support for managing competing work, personal/ academic commitments negatively influenced student learning experiences.[127–129 143 146] ▶ Standardised allocation of study leave/backfill/protected time and prepared practice mentors were essential to support learning.[127–129 132] ▶ Additional training buddying schemes helped students better manage the competing demands of training while working.[129] .
		Study leave	
		Designated Medical Practitioners	
Analytical theme 3: Transition—ensuring early prescribing support	Theme 3.1: Transition as a point of vulnerability	Self-confidence	▶ Transition was a point of high vulnerability for new prescribers with an initial lack of confidence often under-recognised by teams.[135 137 139 140 146 147] ▶ Delineating a minimum scope of practice by restricting formulary and/or using guidelines/protocols facilitated early growth of competence and confidence.[136 137 139 140 147 149] ▶ Early exposure to prescribing opportunity, time and structured support systems with medical supervision were essential in transition.[127 130–132 134–137 139 146 147]
	Theme 3.2: Nurturing confidence and competence	Minimum competence	
		Experience and exposure	
	Theme 3.3: Transition support needs	Informal and formal support systems	
Analytical theme 4: Sustainment—maximising and developing independent prescribing	Theme 4.1: Service delivery	Impact on workload	▶ IP could increase workload and imposed time constraints.[130 135–137 139 140 146 150] Role underuse was a risk in community settings if infrastructural requisites (eg, electronic prescribing/IT clinical record access) failed to be implemented.[130 132 139 140 146 147] ▶ IP for service redesign and sustainability was facilitated by competence development, CPD opportunity and medical/managerial leadership.[130 131 134 137 139 140 142 144 146 147 149 150] ▶ CPD provision and formal evaluation of IP implementation was inconsistent and lacked standardisation in primary care.[130 136 140 147 150] ▶ 'Enhancement', 'substitution' and 'role specific' implementation models based on the maintenance or change in prescribing competence, service reconfiguration and/or substitution of services were identified.[130 137 139 140 142 144 146 147 149]
	Theme 4.2: Supporting role development	Role/service expansion	
		Continued professional development	
		Evaluation and reflection	

CPD, continued professional development; DMPs, designated medical practitioners; GPs, general practitioners; IP, independent prescribing; NMP, non-medical prescribing.

or misuse.[130 136 140 147] Consultative team stakeholder processes facilitated clarification of current medicines pathways bottle necks,[144] helped cement clinical advantage of IP[144] and encouraged a collective understanding of implementation.[142 144 149] Conversely, if existing medicines pathways were perceived to be expedient and IP held limited advantage, adoption was less likely.[141 143]

Descriptive theme 1.2: managerial leadership and support

Lack of managerial leadership and support were highly cited barriers to implementation that persisted across the review decade. Nurse/pharmacist prescribers reported stage specific and ongoing funding,[128 141 143] training[129 130 132 136 137 139 140 147] and infrastructural needs[130 132 139 140 146 147] that extended

across the IP implementation trajectory. Managerial support was, however, frequently reported to diminish post-adoption[128–130 132 136 137 139–141 143 146 147] and many practitioners believed managers lacked knowledge about IP[130 136 137 141 143] or misunderstood its potential for improving service quality.[130 143] Nurses/pharmacists ascribed high value to IP for improving service efficiency[135 136 139 140 146 147] and skill utilisation,[130 132 136 140] perceiving it extended clinical knowledge beyond prescribing,[130 132 140 146] enhanced clinical confidence[130 137 139 140 146] and job satisfaction,[136 139 146] and facilitated team education.[130 142 149] They perceived themselves a unique workforce resource with potential for better mobilisation in under-resourced areas (eg, mental health).[130] However, there was a perception that management lacked appreciation of primary care workforce aspirations for IP[143] and overlooked its scope.[130 141 143] Better recognition and commitment were considered essential for leveraging and driving IP services forward.[130]

Ensuring teams understood IP and its role within care delivery mitigated subsequent barriers[136 137 140 149] and was critical for implementation success.[137 139 140 142 144 146 147 149] Doctors, receptionists,[136 137 149] dispensing pharmacists[146 149] and peer colleagues[139 146 147 149] all played supervisory and/or infrastructural roles in IP implementation and understanding the need for this input was essential. While staff clarity on their roles in relation to IP positively influenced willingness to provide enabling supports such as clinical administration,[136 149] record access[144] and clinical supervision/pharmaceutical advice[140 146] lack of team understanding of IP was a barrier that was cited repeatedly across the review decade.[132 136 137 139 140 143 144 146 147 149]

Descriptive theme 1.3: Interprofessional environment

Respectful, trusting interprofessional relationships promoted an appreciation of different professional skill sets,[149] helped ratify the purpose of IP[127 149] and built team confidence in the prescribing competence of nurses and pharmacists.[127 140] Good relationships facilitated information transfer,[140] promoted supervision provision,[147 149] shared learning[127] and team working.[149] Acceptance and positive attitudes towards IP as a shared skill were facilitative to implementation[142 144 149] and mitigated the likelihood of 'turf wars' emerging if IP roles was perceived to encroach on professional territories.[149] While many nurses/pharmacists reported positive relationships with doctors,[137 139 140 146 149] others described jurisdictional tensions over prescribing authority.[137 143 149] Building trust for IP where relationships were weak took time,[142] and given the important supervisory role of doctors in IP,[130 132 136 139 140 146 147] consideration of their strength in adoption planning is pertinent. Good communication networks were more likely where established relationships and positive attitudes towards IP prevailed,[140 149] and were important for imparting information to teams about IP,[136 142 144] for developing supervision and peer support[140 146] and promoting teamwork.[144 149]

Analytical theme 2: training—optimising practitioner readiness for independent prescribing

This analytical theme refers to the extent to which organisations select and prepare the right practitioners for IP training, as well as how they support and maximise students' learning experiences.

Descriptive theme 2.1: selecting the right practitioners

Overall, strategic planning for IP workforce selection lacked scrutiny, and practitioner choice,[128 130 136] expectation of improved job satisfaction,[136 143 146] efficiency and patient benefit[128 136] were the primary drivers for implementation across the review period. Training course drop out[128] and failure to prescribe following training,[130 132] suggest a need to ensure selection procedures match skills and capabilities to IP and increase the chances of organisational return on IP training investment. Synthesis identified essential skills[130 133 135 136 138 146 148 150] and personal motivation[128 130] as important considerations. Study demographic data indicated a clinically experienced workforce,[130 136 137 146 147] with degree/higher degree educational and/or specialist skills attainment.[128 133 140 148] Advanced physical assessment and clinical specialty skills not only suggested expertise and theoretical knowledge to underpin IP but were also recognised by patients as important contributors to care quality.[133 138 148] Patients reported high levels of confidence in IP led care, with the caveat that prescribers demonstrated knowledge and expertise.[133 138 148] Good interpersonal, communication, examination, history taking and diagnostic skills were key. These were mandatory for differential diagnosis[133–135 148 150] and holistic management,[136 146 150] for conferring practitioner prescribing/non-prescribing decisions[134 135 150] and managing treatment concordance[130 133 135 138 144 148 150] and patient expectations for medicines.[134 135 150] Motivational deterrents to IP uptake that were identified by non-prescribing nurses[143] and physiotherapists[141] were being near retirement,[143] a reluctance to undertake further advanced training,[141 143] concerns about training rigour[141] and a perception of effort/remuneration imbalance.[141 143] Although IP job satisfaction and professional benefits were considered future adoption drivers[143] lack of financial remuneration in particular disincentivised practice nurse[143] and physiotherapy adoption.[141]

Descriptive theme 2.2: preparing and supporting practitioners during training

UK non-medical prescribing training programmes employ profession-specific or interprofessional models, delivering 26 days equivalent full-time education alongside a supervised learning in practice period.[127] Given the onus for safe prescribing, programmes were reported by students and nurse/pharmacist prescribers to be academically rigorous.[129 146] There was evidence however that students lacked key knowledge about generic training models,[143] the learning expectations of different pedagogies,[127] as well as course assessment and portfolio requirements.[128] Expecting narrower, specialty specific rather

than generic training was common.[128 146] Students found the academic demands of training while continuing their usual clinical duties challenging indicating a need to better balance work, personal and academic commitments.[127 129] The degree of allocated support time[128 129] and the quality of mentoring during supervised practice learning[127] were key influences on student learning experiences. Adequate study leave, protected time and backfill respectively optimised study time, reduced personal time encroachment and negated the need to absorb usual role duties while training.[128] Despite organisational requirement to confirm study leave arrangements pre-training, primary care allocation was highly unstandardised, with some students entering training without a confirmed agreement.[128] Prepared practice mentors with clarity on their role obligations in general provided a higher level of input to students,[127] and good mentor–student relationships that continued post-training facilitated transition.[132] Additional training buddying schemes helped students better manage the competing demands of training while working, although time constraints limited their uptake.[129]

Analytical theme 3: transition—ensuring early prescribing support

This analytical theme highlighted the importance of the post-qualification transition period in the development of prescribing confidence/competence and identified a high need for supervision and informal and formal support. Delineating the scope of prescribing competence facilitated early implementation.

Descriptive theme 3.1: transition as a point of vulnerability

Many nurses/pharmacists held vivid memories of anxiety and fear during their first IP encounters,[137 139 140 146 147] reporting a diminution of self-confidence during the early transition period.[135 137 139 140 146 147] This finding traversed the review decade and was unrelated to how prepared prescribers felt by training.[137 146] Heightened awareness of the risks of error,[147] the cautionary approach instilled by training[137 147] and liability for personal accountability[139 146] fuelled feelings. It was recognised that self-confidence and competence development were essential for prescribing[137 147] and mitigated anxiety,[146] but were highly dependent on exposure to prescribing opportunities,[146 147] time[137 147] and above all, the level of available support.[127 132 139 146 147] Without a channel for accessing supervision, nurses/pharmacists could doubt competence, lose confidence and defer from prescribing.[147] This led to a lack of competence development and underutilisation of IP[147] and suggests that greater acknowledgement of transitional developmental needs is necessary.

Descriptive theme 3.2: nurturing competence and confidence

Establishing competence boundaries and recognising personal limitations were important enablers in transition.[137 147] Nurse/pharmacist prescribers defined competence as the immediate clinical areas in which they had the

knowledge and confidence to prescribe.[136 137 139 140 147 149] Delineating individual scope of prescribing practice by restricting the range of medicines prescribed to circumscribed clinical areas[136 140 146 149] in line with clinical guidelines and protocols[137] encouraged the early development of competence.[147] Alternatively, prescribing outside these boundaries,[137] as in complex polypharmacy or comorbidity,[132 140] was deemed risky, unsafe and unprofessional.[136 147 149] Nurses/pharmacists reported that teams often failed to recognise their self-confidence issues related to competence,[140] and exerted inappropriate expectations for IP.[132 136 137] Recognising that as a new skill, development of prescribing competence was time and opportunity dependent[137 146 147] several nurses expressed anxiety that prescribing skills would diminish during transition if not used.[146]

Descriptive theme 3.3: transition support needs

Reports of poor transition support pervaded the review decade[130 132 135 136 139 140 146 147] and there was limited evidence of pre-emptive, formalised supervision provision.[132] Nurses reported this absence as immediately impactful,[139] especially in isolated roles and in services with few prescribers.[130 147] While nurses and pharmacists desired structured and informal supervision,[140 147] in all seven studies addressing this theme,[130 132 136 139 140 146 147] most could only access a variable level of informal support. 'Open door' contemporaneous advice given by GPs was the primary source, although specialist doctors, peers and pharmacists were also consulted. Team receptiveness to providing this mentoring,[147] its reliability[135 139] and accessibility[146 147] were key facilitators. Informal opportunities for discussion provided security[147] and were valued.[136 139 146 147] Exemplifying barrier interdependence, lack of mentoring relationships with doctors limited opportunity for informal support, prevented prescribing and limited competence with specific medicines or clinical conditions.[147] In turn this necessitated re-engagement of GP referral for prescribing and culminated in inequitable patient medicines management.[140 147] To address shortfalls in formal support provision, several prescribers set up local peer networks,[132 136 140] however a strong desire for formalised mentorship was expressed.[130 136 140 147]

Analytical theme 4: sustainment—maximising and developing independent prescribing

This analytical theme describes barriers and facilitators within the descriptive subthemes of service delivery and supporting role development, which relate to how IP was used and maximised in primary care.

Descriptive theme 4.1: service delivery

Prescribers reported that IP promoted efficient, streamlined services.[136 137 139 140 142 146] However, views on how it impacted individual practitioner workload differed.[136 137 139 140 146 147] IP reportedly lengthened consultations,[130 136] added administrative tasks[139 146] and increased job-related stress.[136] Undertaking in-depth

holistic assessment to inform prescribing needs imposed time constraints,[130 150] which were exacerbated in strict 10-minute clinical allocation systems.[135 136] Additional time and experience could however be mitigating.[135 150] Community IPs reported their main workload barriers as administrative and related to absent or incompatible electronic record and prescription generation systems.[132 139 140 146 147 150] Seeking clinical information caused significant delays, in some cases causing IPs to revert to GP referral for prescribing needs.[132 139 146 147] However, recent IT accessibility was suggested to mitigate retrieval problems.[144]

Attitudes towards role change because of IP also influenced perceptions about workload.[136 137] Some prescribers perceived that GPs abdicated responsibility for prescribing following introduction of IP[146] which increased workload and job demand.[136 137] Prescribers negatively referred to this as work offloading,[137] and were suspicious of underpinning financial motives.[143] Alternatively, other prescribers viewed the benefits of IP at a broader service level and as an opportunity to reduce GP colleague workforce pressures.[132 144 146] While GPs in one study stressed that their acceptance of pharmacist IP rested on whether it increased existing workload[142] limited team member involvement within studies precluded synthesis of wider primary care workload impact of IP.

Descriptive theme 4.2: supporting role development

Despite limited contextual detail on workforce planning,[130 144 149] three broadly categorised 'models' of IP implementation were identified. The first *'Enhancement'* model introduced IP to enhance the efficiency of existing nurse/pharmacist roles without changing the pattern of service provision, client group or condition complexity.[137 139 140 147 149] The second *'Substitution'* model adapted existing IP roles to directly substitute or replace GP services, which required some level of structural re-organisation of care and/or a change in core prescribing competence,[130 139 142 144 146] (eg, substituting GPs in out-of-hours palliative care services and additionally managing non-cancer terminal illness[146]). The final, less frequently evidenced *'Role specific'* model created new roles specifically for pharmacist prescribers, for which geriatric chronic disease and comorbidity management were new areas of competence, and in which pharmacists assumed a transfer of responsibility from GPs for care home medicines management.[142 144] One study found that the specific models of employment/funding influenced how well IP roles were integrated,[149] with direct GP practice employment as opposed to commissioned Primary Care Trust (PCT) funded roles creating greater sense of permanence, better role use and enhanced team involvement. This was assumed to result from improved relationships, trust and team building.[142 144]

A strategical top–down approach to implementation of IP was unclear from the reviewed studies, and overall an individual practitioner, bottom–up approach appeared to drive adoption. However, there was some evidence

that where skill mix was recognised and valued within services,[144 149] CPD was readily available[149] and doctors provided leadership[137 149] IP was used to greater extent for primary care redesign and service sustainability. Absent policy and national targets restrained IP resource allocation,[130] while policy and national guidance was facilitative.[142 144] Doctors also imposed constraints on IP by limiting clinical caseloads,[137 147] restricting formularies[132 149] or by retaining sole diagnostic prescribing responsibility for patients.[130 144] For some prescribers, competence expansion was synonymous with crossing job descriptions and mandated formal negotiation with employers.[147]

Provision of CPD overall was inconsistent, untargeted to evolving learning needs,[136 147] and prescribers identified pharmacology,[139] statutory drug updates[136] as key topics. Lack of confidence with heart failure,[140] mental health conditions[130] polypharmacy and off-label prescribing[147] suggested CPD in comorbidities warranted further input. Trust provision included forums/meetings,[136 140] commissioned training, national conference attendance[139 149] and electronic journal resources.[139] However, provision varied widely and with few prescribers reporting accessible CPD systems,[136 140] there was agreement that improved implementation was necessary.[130 136 139 140 147 150]

With time and input to create support systems[140] and enhance communication concerning role boundaries[146] prescribers reported that IP integration improved. However, formal evaluation following implementation was rare,[132] with only two studies[135 150] identifying quality assurance activities such as audit and local/national data benchmarking in the context of antibiotic stewardship.

DISCUSSION

The future of UK primary care is reliant on workforce expansion and introduction of new first-contact non-medical roles.[27 151–154] Ensuring practitioners have the right skills to enable sustainable service development, at scale and pace is key.[155 156] Recent reports of rising non-medical prescriber numbers in some regions of the UK[30 79 157] suggest healthcare providers are recognising the value of prescribing for skill-mix and workforce transformation. Ensuring implementation is optimised, sustained and IP roles are maximised for service and patient benefit is essential.

This is the first meta-synthesis evaluating barriers and facilitators to the implementation of IP by non-medical healthcare professionals in primary care. Guided by theory and synthesising factors across a continuum of implementation provides a temporal dimension and insight into three primary 'enhancement', 'substitution', and 'role specific' models of implementation that previous UK systematic reviews lack.[54 68 69 74] In its infancy in UK primary care non-medical prescribing research,[135 144 158 159] implementation theory is likely to become increasingly important for informing implementation strategies as the governance arrangements for

extended prescribing rights grow in complexity[157] and the socio-political primary care landscape continues to change.[160]

From stakeholders' experiences of implementing IP, barriers and facilitators were identified in four key analytical themes: 'Preparation', 'Training', 'Transition' and 'Sustainment'. While some interdependence and overlap is acknowledged, these themes present a stage based road map of barriers and facilitators for consideration in future implementation.

In the theme 'Preparation', the importance of organisational readiness for implementing IP was reflected by a need for consistent managerial leadership/support, improved team understanding of prescribing role intentions and an interprofessional environment that supports novice prescribers. While nurses and pharmacists considered IP integral to advanced practice and essential to enhance workforce skill utilisation there was concern that it lacked strategic prominence in primary care. Accordingly, the 'Training' theme identified a need for improved managerial recognition of primary care workforce aspirations for IP along with a need to ensure skills and motivations matched those necessary for training. In line with national reports,[43 46 55] the response to the non-medical prescribing agenda has been sluggish in some UK regions,[59] with reforms to commissioning either marginalising[59] or fragmenting its funding.[110 161] Moreover, in common with national evaluations,[43 59 162 163] this synthesis identified a continuing practitioner led implementation of IP with largely voluntary uptake. Contrary to secondary care,[62] there was limited evidence[142 144] for policy driven service design or targeted strategy embedding IP within career or service pathways. This suggests a disjointed approach to implementation that may reflect the rapidly changing policy and service context of UK primary care.[164–166] However, with a third of the non-medical general practice workforce near retirement age,[167] and succession of IP roles lacking guarantee,[149] sustainability of non-medical prescribing capability is a key concern for future management of primary care patient medicines needs.[168]

Transition was identified as a key stage in implementation that warrants greater scrutiny and has resonance for professions such as paramedics who are new to prescribing. While its affective nature[169 170] and need for bespoke support systems has been previously recognised,[171 172] few studies have specifically sampled novice prescribers[170 173] to ascertain optimal supervisory requirements.[169] Despite extension of IP rights to optometrists, physiotherapists, radiographers, podiatrists and paramedics over the past 13 years, focus on implementation issues during transition within each profession has been limited.[43 174 175] This is likely to be especially important for paramedics who, awarded IP rights in 2018 have not been subject to the supplementary prescribing lead in period that characterises other professions[176] and who are historically less well established in the primary care workforce.[177 178] Early data suggesting challenges around role isolation, team

expectations of paramedic IP and lack of legislative parity for controlled drugs warrants further exploration to determine whether paramedics too, face similar barriers identified by this review.[175 179]

In common with other UK reviews,[68 69] limited overall focus on long-term sustainability or strategy for implementation at either local, regional or national level was found. This was echoed by the dominance of the 'enhancement', as opposed to 'role specific' implementation models identified and may reflect the multiple changes made to policy,[180] leadership[181] and commissioning[182] and the ongoing embedding of new governance structures within primary care.[183] Of note, despite finding a need for more cohesive managerial support that extends across the entire implementation trajectory, minimal reference was made to the championing and change agent functions of non-medical prescribing leads.[171 172] The Department of Health has long recommended implementation of non-medical prescribing under direction of a designated lead with strategic, operational and governance footholds.[33] A lack of representation in recent regional research[157] supports the tenet that many of these roles were not replaced in England following the abolition of primary care trusts.[172] Successful implementation is more likely when champions are fully organisationally supported[184] and provide sustained input to implementation activities.[171 185 186] However, a lack of role infrastructure, clarity and designated time,[157 172] along with the increasingly diverse non-medical prescribing workforce is challenging this important role. While other models of primary care workforce mentoring show promise,[187] the repetition and frequency of barriers exposed by this synthesis over the review decade indicate urgent need for a more cohesive approach to supporting IP.

Strengths and limitations

This review strengthens the UK evidence base by identifying challenges to IP implementation in traditional and contemporary primary care contexts. Using comprehensive search strategies and robust analysis methods, it highlights factors during 'Preparation', 'Training', 'Transition' and 'Sustainment' stages and models of implementation which can be used by practitioners and policymakers to identify areas for improving implementation support.

Although limited to UK literature, the theoretical lens ensured focus on common factors known to facilitate implementation (eg, the need for leadership and championing) which are generalisable to any implementation context, either in the UK or internationally. We did not however include grey literature and although qualitative synthesis enabled rich description of elements perceived by stakeholders to influence implementation of IP in the UK, reviews that include quantitative literature in primary care are encouraged. Our focus on primary care excluded barriers and facilitators that may be unique to acute care and other settings. Moreover, as the non-medical prescribing agenda is disseminated across the NHS, it will be increasingly important to consider the theoretical

basis for developing strategies to achieve more successful implementation of this complex innovation in different professions.[67 119 188]

CONCLUSION

Globally, healthcare systems are implementing strategies to address workforce deficits that enhance the skills of nurses, pharmacists and other non-medical healthcare professionals. Integral to advanced scope of practice, it is imperative that IP capability is optimised through successful implementation. This meta-synthesis has identified persistent barriers at the 'Preparation', 'Training', 'Transition' and 'Sustainment' stages of implementation. A more coordinated and targeted approach to overcome barriers identified in these stages is key to ensuring that IP is an effective approach to helping alleviate workforce shortfalls in the UK, and around the world.

ORCID iD
Judith Edwards http://orcid.org/0000-0002-6531-1315

REFERENCES

1 Dugani S, Veillard J, Evans TG. Quality primary health care will drive the realization of universal health coverage. *CMAJ* 2018;190:E453–4.
2 Kluge H, Kelley E, Swaminathan S, *et al*. After Astana: building the economic case for increased investment in primary health care. *Lancet* 2018;392:2147–52.
3 King's Fund. *The health care workforce in England. Make or break?* London: King's Fund, 2018.
4 Stenberg K, Hanssen O, Bertram M, *et al*. Guide posts for investment in primary health care and projected resource needs in 67 low-income and middle-income countries: a modelling study. *Lancet Glob Health* 2019;7:e1500–10.
5 WHO. *Operational framework for primary health care: transforming vision into action*. Geneva: World Health Organization, 2020.
6 Barnett K, Mercer SW, Norbury M, *et al*. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet* 2012;380:37–43.
7 Stafford M, Steventon A, Thorlby R. *Briefing: Understanding the health care needs of people with multiple health conditions*. London: The Health Foundation, 2018.
8 Kingston A, Robinson L, Booth H, *et al*. Projections of multi-morbidity in the older population in England to 2035: estimates from the population ageing and care simulation (PACSim) model. *Age Ageing* 2018;47:374–80.
9 Smith SM, Wallace E, O'Dowd T. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev* 2016;4:CD006560.
10 WHO. *Multimorbidity: Technical Series on Safer Primary Care*. Geneva: World Health Organization, 2016.
11 Lim J, Broughan J, Crowley D, *et al*. COVID-19's impact on primary care and related mitigation strategies: a scoping review. *Eur J Gen Pract* 2021;27:166–75.
12 Greenhalgh T, Knight M, A'Court C, *et al*. Management of post-acute covid-19 in primary care. *BMJ* 2020;370:m3026.
13 Julia C, Saynac Y, Le Joubioux C, *et al*. Organising community primary care in the age of COVID-19: challenges in disadvantaged areas. *Lancet Public Health* 2020;5:e313.
14 Pettigrew LM, Kumpunen S, Mays N. Primary care networks: the impact of covid-19 and the challenges ahead. *BMJ* 2020;370:m3353.
15 Williams S, Tsiligianni I. COVID-19 poses novel challenges for global primary care. *NPJ Prim Care Respir Med* 2020;30:30.
16 IQVIA Institute for Human Data Science. *Global medicine spending and usage trends: outlook to 2024*. New York: IQVIA Institute for Human Data Science, 2020.
17 Avery A, Barber N, Ghaleb M. *Investigating the Prevalence and Causes of Prescribing Errors in General Practice: The PRACtICe Study*. General Medical Council, 2012.
18 WHO. *Declaration of Astana. Global Conference on Primary Health Care: from Alma-Ata towards universal health coverage and the Sustainable Development Goals*. Geneva: World Health Organization, 2018.
19 Osborn R, Moulds D, Schneider EC, *et al*. Primary care physicians in ten countries report challenges caring for patients with complex health needs. *Health Aff* 2015;34:2104–12.
20 Rosen R, Parker H. *New models of primary care: practical lessons from early implementers*. London: Nuffield Trust, 2013.
21 Ham C, Heenan D, Longley M. *Integrated care in Northern Ireland, Scotland and Wales. Lessons for England*. London: The King's Fund, 2013.
22 Mercer SW, Gillies J, Noble-Jones R. *National Evaluation of New Models of Primary Care in Scotland*. Glasgow: Scottish School of Primary Care, 2019.
23 NHS England. Integrating care. In: *Next steps to building strong and effective integrated care systems across England*. London: NHS England, 2020.
24 Welsh Government. *Our plan for a primary care service for Wales up to March 201*. 2015. NHS Wales, 8.
25 Morciano M, Checkland K, Hammond J, *et al*. Variability in size and characteristics of primary care networks in England: observational study. *Br J Gen Pract* 2020;70:e899–905.
26 Department of Health. *The NHS Long Term Plan*. London, UK: Department of Health, 2019.
27 Baird B, Beech J. *Primary care networks explained*. London: The King's Fund, 2020.
28 UK Parliament. *Health and care bill*. London: House of Commons, 2021.
29 Weeks G, George J, Maclure K, *et al*. Non-medical prescribing versus medical prescribing for acute and chronic disease management in primary and secondary care. *Cochrane Database Syst Rev* 2016;11:CD011227.
30 Alghamdi SSA, Hodson K, Deslandes P, *et al*. Prescribing trends over time by non-medical independent prescribers in primary care settings across Wales (2011-2018): a secondary database analysis. *BMJ Open* 2020;10:e036379.

31 National Prescribing Centre. *Non-medical prescribing by nurses, optometrists, pharmacists, physiotherapists, podiatrists and radiographers. A quick guide for commissioners*. Liverpool, 2010.

32 Hogg D. *Prescription, supply and administration of medicines by allied health professionals - where are we now and where are we going? Regional AHP Non-Medical Prescriber Forum*. Taunton, 2019.

33 Department of Health. *Improving patients' access to medicines: a guide to implementing nurse and pharmacist independent prescribing within the NHS in England*. 2nd edn. Leeds, 2006.

34 Graham-Clarke E, Rushton A, Noblet T, *et al*. Non-medical prescribing in the United Kingdom National health service: a systematic policy review. *PLoS One* 2019;14:e0214630.

35 HM Government. *The medicines for human use (prescribing) (miscellaneous amendments) order*, 2006.

36 The National Health Service. *Miscellaneous amendments relating to independent prescribing regulations*. London, 2006.

37 General Pharmaceutical Council. *Standards for the education and training of pharmacist independent prescribers*. London, 2019.

38 Health and Care Professions Council. *Standards for prescribing*. London, 2019.

39 NMC. Standards for prescribing programmes, 2019. Available: https://www.nmc.org.uk/standards/standards-for-post-registration/standards-for-prescribers/standards-of-proficiency-for-nurse-and-midwife-prescribers/ [Accessed 12 Jan 2021].

40 Hales L, Lohan M, Jordan J. 'It's another way of standing outside the door' supplementary prescribing and doctor–nurse partnerships. *Soc Theory Health* 2010;8:210–28.

41 Hill DR, Conroy S, Brown RC, *et al*. Stakeholder views on pharmacist prescribing in addiction services in NHS Lanarkshire. *J Subst Use* 2014;19:56–67.

42 Carey N, Stenner K, Courtenay M. An exploration of how nurse prescribing is being used for patients with respiratory conditions across the East of England. *BMC Health Serv Res* 2014;14:27.

43 Carey N, Stenner K, Edwards J. *Evaluation of physiotherapist and Podiatrist independent prescribing, mixing of medicines and prescribing of controlled drugs. Department of health policy research PR-R7-0513-11002*. Guildford, UK: University of Surrey, 2017.

44 Courtenay M, Carey N, Stenner K. An overiew of non medical prescribing across one strategic health authority: a questionnaire survey. *BMC Health Serv Res* 2012;12:138.

45 Bhanbhro S, Drennan VM, Grant R, *et al*. Assessing the contribution of prescribing in primary care by nurses and professionals allied to medicine: a systematic review of literature. *BMC Health Serv Res* 2011;11:330.

46 Latter S, Blenkinsopp A, Smith A. *Evaluation of nurse and pharmacist independent prescribing*. University of Southampton: Southampton, 2010.

47 Latter S, Smith A, Blenkinsopp A, *et al*. Are nurse and pharmacist independent prescribers making clinically appropriate prescribing decisions? an analysis of consultations. *J Health Serv Res Policy* 2012;17:149–56.

48 Carey N, Edwards J, Otter S, *et al*. A comparative case study of prescribing and non-prescribing physiotherapists and podiatrists. *BMC Health Serv Res* 2020;20:1074.

49 Ecker R, Joshi R, Shanthosh J, *et al*. Non-Medical prescribing policies: a global scoping review. *Health Policy* 2020;124:721–6.

50 Faruquee C, Guirguis L, Hughes C. Characterizing pharmacist prescribers in Alberta using cluster analysis. *J Pharm Health Serv Res* 2018;10.

51 Fong J, Cashin A, Buckley T. Models of prescribing, scope of practice, and medicines prescribed, a survey of nurse practitioners. *J Adv Nurs* 2020;76:2311–22.

52 Kroezen M, van Dijk L, Groenewegen PP, *et al*. Nurse prescribing of medicines in Western European and Anglo-Saxon countries: a systematic review of the literature. *BMC Health Serv Res* 2011;11:127.

53 Ladd E, Schober M. Nurse prescribing from the global vantage point: the intersection between role and policy. *Policy Polit Nurs Pract* 2018;19:1–10.

54 Mills T, Patel N, Ryan K. Pharmacist non-medical prescribing in primary care. A systematic review of views, opinions, and attitudes. *Int J Clin Pract* 2021;75:e13827.

55 Courtenay M, Khanfer R, Harries-Huntly G, *et al*. Overview of the uptake and implementation of non-medical prescribing in Wales: a national survey. *BMJ Open* 2017;7:e015313.

56 Dobel-Ober D, Brimblecombe N. National survey of nurse prescribing in mental health services; a follow-up 6 years on. *J Psychiatr Ment Health Nurs* 2016;23:378–86.

57 Wilson N, Pope C, Roberts L, *et al*. Limited pharmaceuticalisation: a qualitative case study of physiotherapist prescribing practices in an NHS trust in England following the expansion of non-medical prescribing in the UK. *Sociol Health Illn* 2020;42:643–59.

58 Weiss MC. The rise of non-medical prescribing and medical dominance. *Res Social Adm Pharm* 2021;17:632–7.

59 Coull A, Murray I, Turner-Halliday F, *et al*. The expansion of nurse prescribing in Scotland: an evaluation. *Br J Community Nurs* 2013;18:235–42.

60 Drennan J, Naughton C, Allen D. *Independent evaluation of the nurse and midwife prescribing initiative*. Dublin: University College Dublin, 2009.

61 Casey M, Rohde D, Higgins A, *et al*. "Providing a complete episode of care": A survey of registered nurse and registered midwife prescribing behaviours and practices. *J Clin Nurs* 2020;29:152–62.

62 Fisher J, Kinnear M, Reid F, *et al*. What supports hospital pharmacist prescribing in Scotland? - A mixed methods, exploratory sequential study. *Res Social Adm Pharm* 2018;14:488–97.

63 Ross JD, Kettles AM. Mental health nurse independent prescribing: what are nurse prescribers' views of the barriers to implementation? *J Psychiatr Ment Health Nurs* 2012;19:916–32.

64 Stewart D, Maclure K, Newham R, *et al*. A cross-sectional survey of the pharmacy workforce in general practice in Scotland. *Fam Pract* 2020;37:206–12.

65 General Pharmaceutical Council. *Prescribers survey report*. London, 2016.

66 Stenner K, Carey N, Courtenay M. Implementing nurse prescribing: a case study in diabetes. *J Adv Nurs* 2010;66:522–31.

67 Stewart D, Jebara T, Cunningham S, *et al*. Future perspectives on nonmedical prescribing. *Ther Adv Drug Saf* 2017;8:183–97.

68 Graham-Clarke E, Rushton A, Noblet T, *et al*. Facilitators and barriers to non-medical prescribing - A systematic review and thematic synthesis. *PLoS One* 2018;13:e0196471.

69 Noblet T, Marriott J, Graham-Clarke E, *et al*. Barriers to and facilitators of independent non-medical prescribing in clinical practice: a mixed-methods systematic review. *J Physiother* 2017;63:221–34.

70 Jebara T, Cunningham S, MacLure K, *et al*. Stakeholders' views and experiences of pharmacist prescribing: a systematic review. *Br J Clin Pharmacol* 2018;84:1883–905.

71 Nuttall D. Nurse prescribing in primary care: a metasynthesis of the literature. *Prim Health Care Res Dev* 2018;19:7–22.

72 Zhou M, Desborough J, Parkinson A, *et al*. Barriers to pharmacist prescribing: a scoping review comparing the UK, New Zealand, Canadian and Australian experiences. *Int J Pharm Pract* 2019;27:479–89.

73 Edwards J, Coward M, Carey N. Paramedic independent prescribing in primary care: seven steps to success. *J Prescr Pract* 2020;2:292–9.

74 Magowan J. Barriers and enablers to nurse prescribing in primary care. *J Prescr Pract* 2020;2:142–6.

75 Carey N, Stenner K, Courtenay M. Stakeholder views on the impact of nurse prescribing on dermatology services. *J Clin Nurs* 2010;19:498–506.

76 Stewart F, Caldwell G, Cassells K, *et al*. Building capacity in primary care: the implementation of a novel 'Pharmacy First' scheme for the management of UTI, impetigo and COPD exacerbation. *Prim Health Care Res Dev* 2018;19:531–41.

77 Maskrey M, Johnson CF, Cormack J, *et al*. Releasing GP capacity with pharmacy prescribing support and new ways of working: a prospective observational cohort study. *Br J Gen Pract* 2018;68:e735–42.

78 Mann C, Anderson C, Waring J. *"GP Pharmacy Transformation project" Community Pharmacist Independent Prescribers (CPIPs) working in patient facing roles in Primary Care. Independent Evaluation Report*. Nottingham: University of Nottingham, NHS England, 2017.

79 Northamptonshire GP Forward View Programme. *Primary care workforce strategy*. Northampton: Corby Clinical Commissioning Group and Nene Clinical Commissioning Group, 2017.

80 Greenhalgh T, Robert G, Macfarlane F, *et al*. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q* 2004;82:581–629.

81 Rogers E. *Diffusion of innovations*. 5th edn. New York, USA: The Free Press, 2003.

82 Damschroder LJ, Aron DC, Keith RE, *et al*. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci* 2009;4:50.

83 Lambert-Kerzner AC, Aasen DM, Overbey DM, *et al*. Use of the consolidated framework for implementation research to guide dissemination and implementation of new technologies in surgery. *J Thorac Dis* 2019;11:S487–99.

84 Chor KHB, Wisdom JP, Olin S-CS, *et al*. Measures for predictors of innovation adoption. *Adm Policy Ment Health* 2015;42:545–73.

85 Dearing JW, Cox JG. Diffusion of innovations theory, principles, and practice. *Health Aff* 2018;37:183–90.

86 Dearing JW, Singhal A. New directions for diffusion of innovations research: Dissemination, implementation, and positive deviance. *Hum Behav Emerg Technol* 2020;2:307–13.

87 Breimaier HE, Heckemann B, Halfens RJG, *et al*. The consolidated framework for implementation research (CFIR): a useful theoretical framework for guiding and evaluating a guideline implementation process in a hospital-based nursing practice. *BMC Nurs* 2015;14:43.

88 CFIR. *Consolidated framework for implementation research*. Ann Arbor: USA: CFIR Research Team-Center for Clinical Management Research, 2021. https://cfirguide.org/tools/

89 Damschroder LJ, Reardon CM, Sperber N, *et al*. Implementation evaluation of the telephone lifestyle coaching (TLC) program: organizational factors associated with successful implementation. *Transl Behav Med* 2017;7:233–41.

90 Tong A, Flemming K, McInnes E, *et al*. Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Med Res Methodol* 2012;12:181.

91 Page MJ, McKenzie JE, Bossuyt PM, *et al*. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71.

92 Aguirre R, Bolton K. Qualitative interpretive meta-synthesis in social work research: Uncharted Territory. *J Soc Work* 2014;14:279–94.

93 Nye E, Melendez-Torres GJ, Origins BC. Methods and advances in qualitative meta-synthesis. *Rev Educ* 2016;4:57–79.

94 et alBooth A, Noyes J, Flemming K. Guidance on choosing qualitative evidence synthesis methods for use in health technology assessments of complex interventions (on-line, 2016. Available: http://www.integrate-hta.eu/downloads/ [Accessed 17 Dec 2021].

95 National Cancer Institute. *Qualitative research in implementation science (QualRIS)*. USA: U.S. Department of Health and Human Sciences, National Institues of Health, 2019.

96 Michie S, Fixsen D, Grimshaw JM, *et al*. Specifying and reporting complex behaviour change interventions: the need for a scientific method. *Implement Sci* 2009;4:40.

97 Edwards J, Coward M, Carey N. *Barriers and facilitators to implementation of non-medical independent prescribing in primary care: a qualitative systematic review (CRD42019124400)*. York: PROSPERO, 2019.

98 Bosch M, van der Weijden T, Wensing M, *et al*. Tailoring quality improvement interventions to identified barriers: a multiple case analysis. *J Eval Clin Pract* 2007;13:161–8.

99 Grol R, Wensing M. What drives change? barriers to and incentives for achieving evidence-based practice. *Med J Aust* 2004;180:S57–60.

100 Nilsson-Kajermo K, Bostrom A-M, Thompson DS. The BARRIERS scale - the barriers to research utilization scale: a systematic review. *Implementation science: IS* 2010;5.

101 Shaw B, Cheater F, Baker R, *et al*. Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev* 2005:CD005470.

102 WHO. *How do we ensure that innovation in health service delivery and organization is implemented sustained and spread?* Copenhagen: European Observatory on Health Systems and Policies, 2018.

103 Cooke A, Smith D, Booth A. Beyond PICO: the SPIDER tool for qualitative evidence synthesis. *Qual Health Res* 2012;22:1435–43.

104 Rogers M, Bethel A, Abbott R. Locating qualitative studies in dementia on MEDLINE, EMBASE, CINAHL, and PsycINFO: a comparison of search strategies. *Res Synth Methods* 2018;9:579–86.

105 Rosumeck S, Wagner M, Wallraf S, *et al*. A validation study revealed differences in design and performance of search filters for qualitative research in PsycINFO and CINAHL. *J Clin Epidemiol* 2020;128:101–8.

106 Department of Health. *Equity and excellence: Liberating the NHS*. London, UK: NHS, 2010.

107 HM Government. *The Health and Social Care Act 2012*. London: The Stationery Office, 2012.

108 NHS England. *Five Year Forward View*. London, 2014.

109 Vizard P, Obolenskaya P. *The Coalition's Record on Health: Policy, Spending and Outcomes 2010-2015. Social Policy in a Cold Climate: Working Paper*. London, UK: The London School of Economics and Political Science, 2015.

110 Gadsby EW, Peckham S, Coleman A, *et al*. Commissioning for health improvement following the 2012 health and social care reforms in England: what has changed? *BMC Public Health* 2017;17:1–11.

111 Miller T, Bonas S, Dixon-Woods M. Qualitative research on breastfeeding in the UK: a narrative review and methodological reflection. *Evid Policy* 2007;3:197–230.

112 Noyes J, Popay J. Directly observed therapy and tuberculosis: how can a systematic review of qualitative research contribute to improving services? A qualitative meta-synthesis. *J Adv Nurs* 2007;57:227–43.

113 Carroll C, Booth A, Lloyd-Jones M. Should we exclude inadequately reported studies from qualitative systematic reviews? an evaluation of sensitivity analyses in two case study reviews. *Qual Health Res* 2012;22:1425–34.

114 Sirriyeh R, Lawton R, Gardner P, *et al*. Reviewing studies with diverse designs: the development and evaluation of a new tool. *J Eval Clin Pract* 2012;18:746–52.

115 Fenton L, Lauckner H, Gilbert R. The QATSDD critical appraisal tool: comments and critiques. *J Eval Clin Pract* 2015;21:1125–8.

116 National Institute of Care and Health Excellence. *Developing NICE guidelines: the manual*. London, 2020. https://www.nice.org.uk/process/pmg20/chapter/reviewing-research-evidence

117 Noyes J, Booth A, Lewin S, *et al*. Applying GRADE-CERQual to qualitative evidence synthesis findings-paper 6: how to assess relevance of the data. *Implement Sci* 2018;13:4.

118 Fixsen DL, Blase KA, Van Dyke MK. The stages of implementation. Implementation Practice & Science. *Chapel Hill, NC: Active Implementation Research Network* 2019:81–108.

119 Nilsen P. Making sense of implementation theories, models and frameworks. *Implement Sci* 2015;10:53.

120 Saldana L. The stages of implementation completion for evidence-based practice: protocol for a mixed methods study. *Implement Sci* 2014;9:43.

121 Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;8:45.

122 Sandelowski M. Whatever happened to qualitative description? *Res Nurs Health* 2000;23:334–40.

123 Checkland K, Harrison S, Marshall M. Is the metaphor of 'barriers to change' useful in understanding implementation? Evidence from general medical practice. *J Health Serv Res Policy* 2007;12:95–100.

124 Hossain LN, Fernandez-Llimos F, Luckett T, *et al*. Qualitative meta-synthesis of barriers and facilitators that influence the implementation of community pharmacy services: perspectives of patients, nurses and general medical practitioners. *BMJ Open* 2017;7:e015471.

125 Booth A, Carroll C, Ilott I, *et al*. Desperately seeking dissonance: identifying the disconfirming case in qualitative evidence synthesis. *Qual Health Res* 2013;23:126–41.

126 Bazeley P. Analysing qualitative data: More than 'identifying themes'. *Malays J Qual Res* 2009;2.

127 Afseth JD, Paterson RE. The views of non-medical prescribing students and medical mentors on interprofessional competency assessment - A qualitative exploration. *Nurse Educ Today* 2017;52:103–8.

128 Boreham N, Coull AF, Murray ID, *et al*. Education programmes preparing independent prescribers in Scotland: an evaluation. *Nurse Educ Today* 2013;33:321–6.

129 Bowskill D, Meade O, Lymn JS. Use and evaluation of a mentoring scheme to promote integration of non-medical prescribing in a clinical context. *BMC Med Educ* 2014;14:1–12.

130 Brodie L, Donaldson J, Watt S. Non-medical prescribers and benzodiazepines: a qualitative study. *Nurse Prescribing* 2014;12:353–9.

131 Carter M, Chapman S, Watson MC. Multiplicity and complexity: a qualitative exploration of influences on prescribing in UK general practice. *BMJ Open* 2021;11:e041460.

132 Cole T, Gillett K. Are nurse prescribers issuing prescriptions in palliative care? *Nurse Prescribing* 2015;13:98–102.

133 Courtenay M, Stenner K, Carey N. The views of patients with diabetes about nurse prescribing. *Diabet Med* 2010;27:1049–54.

134 Courtenay M, Rowbotham S, Lim R, *et al*. Antibiotics for acute respiratory tract infections: a mixed-methods study of patient experiences of non-medical prescriber management. *BMJ Open* 2017;7:e013515.

135 Courtenay M, Rowbotham S, Lim R, *et al*. Examining influences on antibiotic prescribing by nurse and pharmacist prescribers: a

qualitative study using the theoretical domains framework and COM-B. *BMJ Open* 2019;9:e029177.

136 Cousins R, Donnell C. Nurse prescribing in general practice: a qualitative study of job satisfaction and work-related stress. *Fam Pract* 2012;29:223–7.

137 Daughtry J, Hayter M. A qualitative study of practice nurses' prescribing experiences. *Practice Nursing* 2010;21:310–4.

138 Dhalivaal J. Patients' perspectives on prescribing by nurses in general practice. *Practice Nursing* 2011;22:41–6.

139 Downer F, Shepherd CK. District nurses prescribing as nurse independent prescribers. *Br J Community Nurs* 2010;15:348–52.

140 Herklots A, Baileff A, Latter S. Community matrons' experience as independent prescribers. *Br J Community Nurs* 2015;20:217.

141 Holden MA, Whittle R, Waterfield J, *et al*. A mixed methods exploration of physiotherapist's approaches to analgesic use among patients with hip osteoarthritis. *Physiotherapy* 2019;105:328–37.

142 Inch J, Notman F, Bond CM, *et al*. The Care Home Independent Prescribing Pharmacist Study (CHIPPS)-a non-randomised feasibility study of independent pharmacist prescribing in care homes. *Pilot Feasibility Stud* 2019;5:89.

143 Kelly A, Neale J, Rollings R. Barriers to extended nurse prescribing among practice nurses. *Community Pract* 2010;83:21–4.

144 Lane K, Bond C, Wright D, *et al*. "Everyone needs to understand each other's systems": Stakeholder views on the acceptability and viability of a Pharmacist Independent Prescriber role in care homes for older people in the UK. *Health Soc Care Community* 2020;28:1479–87.

145 Latham K, Nyatanga B. Community palliative care clinical nurse specialists as independent prescribers: Part 1. *Br J Community Nurs* 2018;23:94–8.

146 Latham K, Nyatanga B. Community palliative care clinical nurse specialists as independent prescribers: Part 2. *Br J Community Nurs* 2018;23:126–33.

147 Maddox C, Halsall D, Hall J, *et al*. Factors influencing nurse and pharmacist willingness to take or not take responsibility for non-medical prescribing. *Res Social Adm Pharm* 2016;12:41–55.

148 Stenner KL, Courtenay M, Carey N. Consultations between nurse prescribers and patients with diabetes in primary care: a qualitative study of patient views. *Int J Nurs Stud* 2011;48:37–46.

149 Weiss MC, Platt J, Riley R. GPs, nurses and pharmacists as prescribers in primary care: an exploration using the social identity approach / Hausärzte/-innen, Diplomierte Pflegefachpersonen und Apotheker/-innen ALS Arzneimittelverschreiber/-innen: eine exploration MIT dem ansatz Der Sozialen Identität. *Int J Health Prof* 2016;3:153–64.

150 Williams SJ, Halls AV, Tonkin-Crine S, *et al*. General practitioner and nurse prescriber experiences of prescribing antibiotics for respiratory tract infections in UK primary care out-of-hours services (the unite study). *J Antimicrob Chemother* 2018;73:795–803.

151 Health Education England. *The future of primary care. Creating teams for tomorrow*. London, UK: Primary Care Workforce Commission, 2015.

152 Health Education England. *Elective Care High Impact Interventions: First Contact Practitioner for MSK Services*. London: Health Education England, NHS Improvment, 2019.

153 NHS England. *Building the workforce — the new deal for general practice*. London: NHS England, Health Education England, 2015.

154 NHS England. *General Practice Forward View*. London: NHS England, 2016.

155 Beech J, Bottery S, Charlesworth A. *Closing the gap. Key areas for action on the health and care workforce*. London, UK: The Nuffield Trust, 2019.

156 Primary Care Workforce Commission. The future of primary care. Creating teams for tomorrow. In: Roland M, ed. *Report by the primary care workforce Commission*. London: Health Education England, 2015.

157 Jarmain S, Carey N. Exploring the roles and responsibilities of non-medical prescribing leads in the South West of England. *J Prescr Pract* 2020;2:546–54.

158 Lim R, Courtenay M, Deslandes R, *et al*. Theory-based electronic learning intervention to support appropriate antibiotic prescribing by nurse and pharmacist independent prescribers: an acceptability and feasibility experimental study using mixed methods. *BMJ Open* 2020;10:e036181.

159 Reeve J, Britten N, Byng R, *et al*. Identifying enablers and barriers to individually tailored prescribing: a survey of healthcare professionals in the UK. *BMC Fam Pract* 2018;19:17.

160 Lau R, Stevenson F, Ong BN, *et al*. Achieving change in primary care--effectiveness of strategies for improving implementation of complex interventions: systematic review of reviews. *BMJ Open* 2015;5:e009993.

161 Ham C, Baird B, Gregory S. *The NHS under the coalition government. Part one: NHS reform*. London: King's Fund, 2015.

162 Hacking S, Taylor J. *An evaluation of the scope and practice of Non Medical Prescribing in the North West For NHS North West*. Manchester, UK: NHS North West, 2010.

163 i5 Health. *Non-Medical prescribing; an economic evaluation*. NHS Health Education North West, 2015.

164 Pettigrew LM, Kumpunen S, Mays N, *et al*. The impact of new forms of large-scale general practice provider collaborations on England's NHS: a systematic review. *Br J Gen Pract* 2018;68:e168.

165 Sheaff R. Plural provision of primary medical care in England, 2002–2012. *J Health Serv Res Policy* 2013;18:20–8.

166 Smith J, Holder H, Edwards N. *Securing the future of general practice: new models of primary care*. London: Kings' Fund, Nuffield Trust, 2013.

167 Digital NHS. *General Practice Workforce: interactive dashboard*. London: NHS Digital, 2022.

168 Tonna A, McCaig D, Diack L, *et al*. Development of consensus guidance to facilitate service redesign around pharmacist prescribing in UK hospital practice. *Int J Clin Pharm* 2014;36:1069–76.

169 Abuzour AS, Lewis PJ, Tully MP. Practice makes perfect: a systematic review of the expertise development of pharmacist and nurse independent prescribers in the United Kingdom. *Res Social Adm Pharm* 2018;14:6–17. 10.1016/j.sapharm.2017.02.002.

170 Bowskill D, Timmons S, James V. How do nurse prescribers integrate prescribing in practice: case studies in primary and secondary care. *J Clin Nurs* 2013;22:2077–86.

171 Courtenay M, Carey N, Stenner K. Non medical prescribing leads views on their role and the implementation of non medical prescribing from a multi-organisational perspective. *BMC Health Serv Res* 2011;11:1–10.

172 Lim RHM, Courtenay M, Fleming G. Roles of the non-medical prescribing leads within organisations across a strategic health authority: perceived functions and factors supporting the role. *Int J Pharm Pract* 2013;21:82–91.

173 Ziegler L, Bennett M, Blenkinsopp A, *et al*. Non-medical prescribing in palliative care: a regional survey. *Palliat Med* 2015;29:177–81.

174 Spillane D, Courtenay M, Chater A, *et al*. Factors influencing the prescribing behaviour of independent prescriber optometrists: a qualitative study using the theoretical domains framework. *Ophthalmic Physiol Opt* 2021;41:301-315.

175 Stenner K, van Even S, Collen A. Early adopters of paramedic prescribing: a qualitative study. *Br Paramed J* 2021;6:30–7.

176 CoP. *Improving patients' access to medicines: a guide to implementing Paramedic prescribing within the NHS in the UK*. Bridgewater, UK: College of Paramedics, 2018.

177 Eaton G, Wong G, Williams V, *et al*. Contribution of paramedics in primary and urgent care: a systematic review. *Br J Gen Pract* 2020;70:e421.

178 Wagstaff B, Mistry V. The integration of paramedics into primary care. *Br J Gen Pract* 2020;70:123.

179 Dixon M. The developing role of the paramedic prescriber. *J Prescr Pract* 2020;2:98–101.

180 Regmi K, Mudyarabikwa O. A systematic review of the factors - barriers and enablers - affecting the implementation of clinical commissioning policy to reduce health inequalities in the National Health Service (NHS), UK. *Public Health* 2020;186:271–82.

181 Marshall M, Holti R, Hartley J, *et al*. GP leadership in clinical commissioning groups: a qualitative multi-case study approach across England. *Br J Gen Pract* 2018;68:e427.

182 Peckham S, Falconer J, Gillam S. *The organisation and delivery of health improvement in general practice and primary care: a scoping study. health services and delivery research Southampton (UK)*. NIHR Journals Library, 2015.

183 Smith JA, Parkinson S, Harshfield A. *Early evidence of the development of primary care networks in England: a rapid evaluation study*. NIHR Health Services and Delivery Research Topic Report: Southampton, 2020.

184 Bunce AE, Gruß I, Davis JV, *et al*. Lessons learned about the effective operationalization of champions as an implementation strategy: results from a qualitative process evaluation of a pragmatic trial. *Implement Sci* 2020;15:87.

185 Miech EJ, Rattray NA, Flanagan ME, *et al*. Inside help: an integrative review of champions in healthcare-related implementation. *SAGE Open Med* 2018;6:2050312118773261.

186 Powell BJ, Waltz TJ, Chinman MJ, *et al*. A refined compilation of implementation strategies: results from the expert recommendations for implementing change (ERIC) project. *Implement Sci* 2015;10:21.

187 Bryce C, Russell R, Dale J. Learning from the transfer of a fellowship programme to support primary care workforce needs in the UK: a qualitative study. *BMJ Open* 2019;9:e023384.

188 O'Cathain A, Croot L, Duncan E, *et al*. Guidance on how to develop complex interventions to improve health and healthcare. *BMJ Open* 2019;9:e029954.

189 . NVivo qualitative data analysis software. Version 12. [program]. 2018.

190 Evans C, Tweheyo R, McGarry J, *et al*. Seeking culturally safe care: a qualitative systematic review of the healthcare experiences of women and girls who have undergone female genital mutilation/cutting. *BMJ Open* 2019;9:e027452.