


BMJ Open How prepared are newly qualified allied health professionals for practice in the UK? A systematic review

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To cite: Brennan N, Burns L, Mattick K, *et al.* How prepared are newly qualified allied health professionals for practice in the UK? A systematic review. *BMJ Open* 2024;**14**:e081518. doi:10.1136/bmjopen-2023-081518

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<https://doi.org/10.1136/bmjopen-2023-081518>).

Received 30 October 2023
Accepted 28 March 2024



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ABSTRACT

Objectives It is important that allied health professionals (AHPs) are prepared for clinical practice from the very start of their working lives to provide quality care for patients, for their personal well-being and for retention of the workforce. The aim of this study was to understand how well newly qualified AHPs were prepared for practice in the UK.

Design Systematic review.

Data sources Embase, MEDLINE, CINAHL, ERIC and BEI were searched from 2012 to 2024. Grey literature searching and citation chasing were also conducted.

Eligibility criteria We included primary studies reporting the preparedness for practice of UK graduates across 15 professions; all study types; participants included graduates who were up to 2 years postgraduation, their supervisors, trainers, practice educators and employers; and all outcome measures.

Data extraction and synthesis A standardised data extraction form was used. Studies were quality assessed using the Quality Appraisal for Diverse Studies tool. 10% of articles were independently double-screened, extracted and quality assessed; 90% was completed by one researcher.

Results 14 reports were included (9 qualitative, 3 mixed-method and 2 quantitative). Six papers focused on radiographers, three on a mixture of professions, two on paramedics, and one each on physiotherapists, clinical psychologists and orthotists. An important finding of the review is the paucity and low-medium quality of research on the topic. The narrative synthesis tentatively suggests that graduates are adequately prepared for practice with different professions having different strengths and weaknesses. Common areas of underpreparedness across the professions were responsibility and decision-making, leadership and research. Graduates were generally well prepared in terms of their knowledge base.

Conclusion High-quality in-depth research is urgently needed across AHPs to elucidate the specific roles, their nuances and the areas of underpreparedness. Further work is also needed to understand the transition into early clinical practice, ongoing learning opportunities through work, and the supervision and support structures in place.

PROSPERO registration number CRD42022382065.

INTRODUCTION

The healthcare workforce is comprised of many different professions to meet the needs of patients. A vital part of this healthcare workforce are allied health professionals (AHPs).

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ A rigorous review conducted following Centre for Reviews and Dissemination guidelines resulting in a comprehensive narrative synthesis of 14 reports, and reported using Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 checklist.
- ⇒ Conducted by a multidisciplinary team of people with social science and clinical (medicine, chiropractic, paramedic, biomedical scientist and dietitian) backgrounds.
- ⇒ The summary of evidence derived from a review can only be as good as the literature it finds and the majority of included studies were self-report.
- ⇒ The studies were not 100% independently double-screened, extracted or quality assessed; however, a 10% sample for each process was completed, compared and discussed fully with few disagreements.

AHPs provide a range of diagnostic, technical, therapeutic and support services in connection with healthcare.¹ To ensure patient safety, high-quality education and training of AHPs are essential.^{2 3} It is important that AHPs are prepared for clinical practice from the very start of their working lives in order to provide quality care for patients, for their own personal well-being⁴ and for the retention of the workforce.⁵ But how prepared are today's AHPs for practice?

Preparedness for practice has been defined in the literature as the combination of knowledge, skills and behaviour that graduates should possess at the point of entering the workforce.⁶ In recent years, the conceptualisation has been widened to include professional values, personal attributes and contextual/environmental factors.⁷ Theoretically, the concept of preparedness to practice is difficult to accurately pin down.⁸ Being 'prepared' typically involves graduates possessing certain knowledge, skills and behaviour at the point of initial practice.⁶ But another important facet is the longitudinal

aspect of the concept, that is, the preparedness of graduates for a lifetime of practice. Given the complexity of patient care and fast-paced ever-changing environment that healthcare is typically delivered in, it is important that graduates have the skills for lifelong learning.⁶ It may be unrealistic to think graduates will be (or feel) prepared for all eventualities so having the skills to identify and acquire what they may need to learn when they start clinical practice is vital.

Medical graduates' preparedness for practice has been extensively researched.⁷⁻¹⁸ A recent report on the topic found that UK medical graduates felt prepared for communication, knowing when to escalate decisions, understanding their own knowledge and professional limits, and multidisciplinary teams (MDTs) led by other healthcare practitioners, and understanding team hierarchies, and patient-centred care and self-awareness.⁷⁻¹⁹ In contrast, they felt underprepared for complex communication, complex clinical decision-making in acute settings, fostering empowerment, dealing with uncertainty, and understanding different healthcare team roles, leadership and prioritising tasks.⁷⁻¹⁹ However, more clinical experience gained as an undergraduate student helped to ease the stress of the transition.^{4,7}

Conversely, and concerningly, AHPs' preparedness for practice has been less researched. Many AHPs (although not all) work in MDTs; thus, graduates being underprepared for practice has an impact on the functioning of the broader healthcare team.⁶ The transition from student to practising clinician is frequently experienced as very stressful.²⁰ Ensuring that graduates are prepared as well as they possibly can be for their challenging roles eases this stressful transition, which we hypothesise could mean fewer professionals are likely to leave the workforce in the early years of clinical practice. A scoping review of why newly qualified nurses leave the profession found that stress and burnout are particularly high in newly qualified nurses and that the number of nurses leaving the

profession is particularly high in the first 2 years of service before declining.⁵ Thus, as this is such an important topic and there have been no published systematic reviews to date, we conducted a systematic review of the literature to answer the following research question (RQ):

RQ1. How well are newly qualified AHPs prepared for practice in the UK?

METHODS

Context

This study was funded by the Health and Care Professions Council (HCPC). The HCPC is a public body responsible for regulating 15 health and care professions in the UK.²¹ In 2023, approximately 320 000 individuals were on the HCPC register. The 15 professional groups regulated by the HCPC are listed in [table 1](#).

Type of review

This is a systematic review of the literature following the methods detailed by the Centre for Reviews and Dissemination (CRD).²²

Review protocol

A review protocol was developed by the research team and was registered with PROSPERO (CRD42022382065).²³ There were some changes to our review compared with the PROSPERO protocol. First, we used the Quality Appraisal for Diverse Studies (QuADS) tool rather than the Mixed Methods Appraisal Tool, for quality assessment. The QuADS tool has been tested and validated for health services research studies which are close in nature to our included studies. Second, originally, we set out to conduct a rapid review of the literature as detailed in our PROSPERO protocol due to resource limitations in the study team. However, because of the small number of papers returned, we were able to conduct all the stages required for a systematic review, and so the review type²⁴

Table 1 Inclusion criteria

Category	Preparedness for practice review
1 Population	Allied health profession (AHP) graduates up to 2 years postgraduation, supervisors, trainers, practice educators and employers of graduates. All 15 professional groups regulated by the HCPC including arts therapists (art psychotherapists, dramatherapists and music therapists), biomedical scientists, chiropodists/podiatrists, clinical scientists, dietitians, hearing aid dispensers, occupational therapists, operating department practitioners, orthoptists, paramedics, physiotherapists, practitioner psychologists, prosthetists/orthotists, radiographers, speech and language therapists
2 Intervention/topic of interest	Preparedness for practice
3 Study design	Both quantitative and qualitative study designs that report empirical data
4 Outcome measures	All outcome measures
5 Country of interest	UK only
6 Language	Studies published in English language
7 Date	2012–present as we were interested in AHPs' current state of preparedness

HCPC, Health and Care Professions Council.

Box 1 Search methods

- ⇒ Searching of healthcare databases (Embase, MEDLINE, CINAHL) and educational databases (ERIC, BEI).
- ⇒ Checking citations contained in the reference lists of included papers.
- ⇒ Grey literature searching for reports and theses. This included searching the websites of all Health and Care Professions Council-regulated professional bodies in the UK (see online supplemental appendix A for full list). The British Library database of UK theses (EthOS) was also searched.

was changed to a systematic review during the write-up phase.

Search strategy

The search strategy (online supplemental appendix A) was designed using the Population, Intervention, Comparator, Outcome (PICO) framework, piloted and carried out by an experienced information specialist (LB) on 25 November 2022.²⁵ The searches were subsequently updated on 29 February 2024. The search strategy included a combination of search methods (Box 1).

The bibliographical databases were searched with free-text synonyms and controlled vocabulary for the following three blocks: HCPC-regulated health and care professions, preparedness for practice and filtered for the UK.²⁶

Article selection

The inclusion criteria for each paper are outlined in table 1. A screening pilot was initially conducted with a random sample of 10% of the included studies by NB and LB to ensure there was agreement in the application of the inclusion criteria. The remaining titles and abstracts were then randomly divided into two groups with one group being screened by NB and the other by LB. If there were any doubts about the inclusion of a paper, NB and LB discussed them and made the decision together.

Data extraction

The papers of all eligible studies were obtained and read in full by NB, LB and AM. A standardised data extraction form was developed a priori based on the research question by NB and LB. The data extraction form was designed in Excel which was then piloted and used. As a reliability indicator, 10% of the articles were extracted independently by two members of the research team and then compared. Data from the remaining articles (90%) were singly extracted by members of the research team (NB, LB and AM). Papers were quality assessed using the QuADS tool by NB.¹⁰ A 10% check was carried out by LB.

Data synthesis

The evidence synthesis adopted a narrative approach with the data extracted from the included articles being reported by profession. A thematic analysis was conducted within and across professions. In addition, the extracted data were mapped to the HCPC's standards of

proficiency in order to highlight the quantity of evidence in the literature for each area. This mapping will provide a useful rubric for those involved in curriculum development, offering an at-a-glance understanding of how many included studies reported findings related to each aspect of practice.

Reporting

The review was reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist.²⁷ All materials used in the review are available from the corresponding author on request, for example, data extraction forms.

Patient and public involvement

None.

RESULTS

Literature identified

The search identified 1880 records, and after screening, 14 reports of 13 studies satisfied the inclusion criteria (figure 1). There were two reports of one study.^{20 28} The grey literature search identified three reports.^{28–30} The characteristics of the 14 included reports are listed in table 2.

Characteristics of included studies

Of the 14 reports of included studies, 9 were qualitative studies (interviews and focus groups), 3 were mixed method (questionnaires) and 2 were quantitative (questionnaires). Six papers focused on radiographers, three on a mixture of professions, two on paramedics and one each on physiotherapists, clinical psychologists and orthotists. Seven reports of included studies had newly qualified professionals as participants; three had other stakeholders, that is, supervisors and managers; three had a mixture of newly qualified professionals and other stakeholders; and one had students, newly qualified professionals and alumni.

Newly qualified professionals' preparedness for practice

In the following subsections, we present the synthesis of included studies grouped by profession, with the final subsection presenting cross-cutting themes.

Radiography

When newly qualified radiographers first started work, graduates who had entered a completely new diagnostic department upon graduation reported experiencing reality shock.^{20 28} Another study of radiographers, where graduates entered the hospital they had carried out their undergraduate placements in, did not report any reality shock.³¹

New graduates reported being tired from working a full-time job which involved long hours, weekend working, 24-hour shift patterns and being on call. They also found the imaging department to be very busy.³¹ This was unexpected and something that they reported not feeling

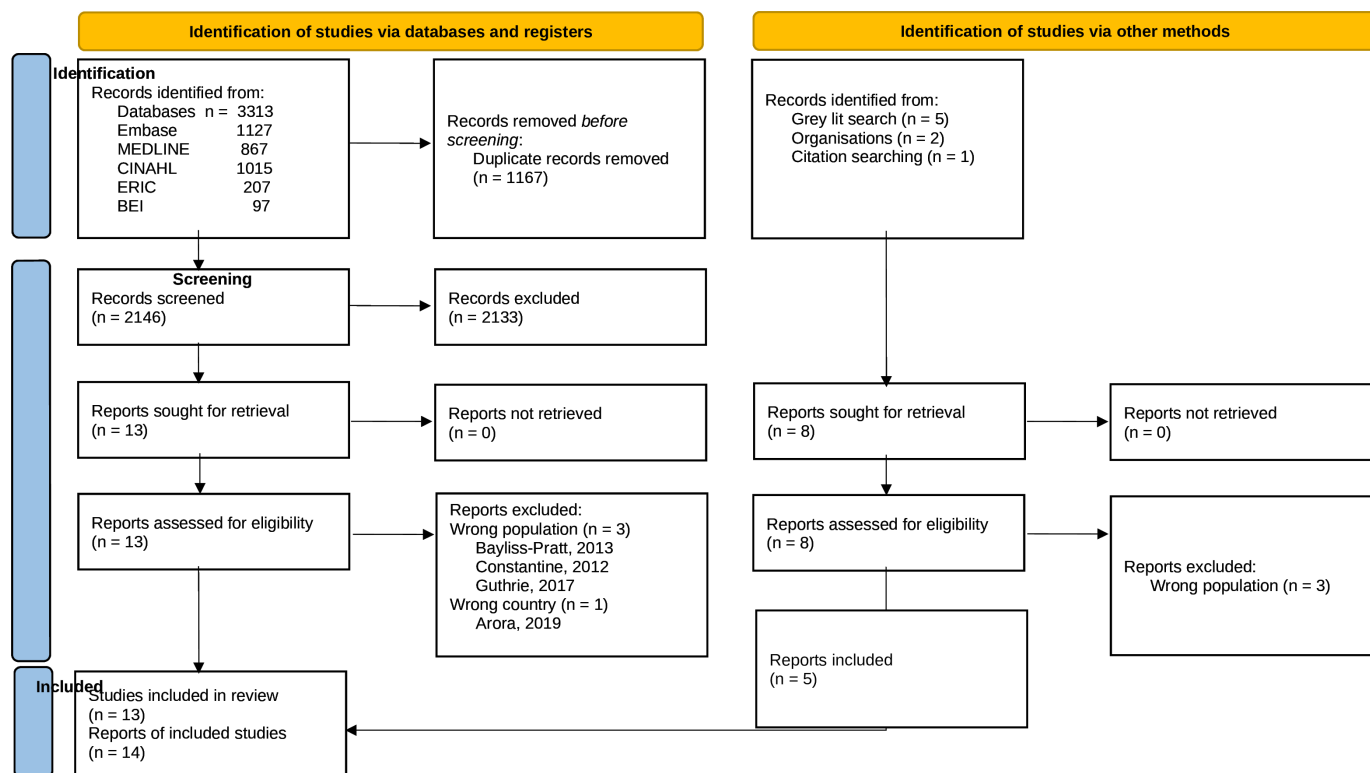


Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram.²⁷

prepared for. Participants were also overwhelmed by the amount they still had to learn in the new environment. While this shock only lasted for 3–6 months (reported by participants through longitudinal interviews), it was experienced as a very stressful and emotional time for the newly qualified graduates, making it difficult to fit in and have a smooth transition. Many participants in one of the included studies described this first 3 months with phrases such as ‘absolutely terrifying’, ‘absolutely petrifying’, ‘quite a roller-coaster’, ‘a big learning curve’ and ‘stressful’ (29: 66). These strong emotions were felt by nearly all of the participants at this early stage, highlighting that this was a challenging and frightening time for the new registrants.²⁰

Newly qualified radiographers were concerned about working in areas where they lacked experience and they had a ‘fear of the unknown’, particularly working outside of normal working hours and in operating theatres.³¹ However, for some, their confidence increased when they had to manage on their own and work things out for themselves.³¹ Some participants reported that they recognised when they needed support and, in this study, seemed to have no problem asking for support when they needed it. Some were also concerned about taking responsibility for both themselves and for students, as well as checking their images for technical acceptability and justifying the request cards. Interestingly, a few of the newly qualified radiographers in this study seemed to have a desire to cast off the student identity when they started practice.³¹

One of the included studies highlighted the fact that the role of the graduate radiographer is in a state of flux.³²

This is reportedly because current radiography education is mainly focused around a specific type of professional duty, that is, projectional radiography (which produces two-dimensional images) and CT of the head. Graduates’ first posts in clinical practice are defined by the particular department, role function or employer they work for and thus their scope of practice is defined by their particular role. The competences developed in their preregistration training may be used in that role or sometimes new competences may need to be developed via induction programmes and preceptorship to match that role. This was particularly the case for cross-sectional imaging in that a newly qualified graduate may start work in this field and never use their competences developed in projectional radiography again, despite this still being the most commonly used of all the imaging modalities.³²

A quantitative study involving a questionnaire completed by newly qualified radiographers (n=85) found that many (77.6%) were confident with their red dot skills (a method to identify potential abnormalities on plain radiographs). However, a sizeable number of respondents reported not being confident in describing abnormalities (approximately 33%). 30% of participants thought Preliminary Clinical Evaluation (PCE) training at university was not suitable, and 55% thought PCE training on placement was not suitable.³³

Management and leadership skills were considered a very weak area for newly qualified therapeutic radiographers. Therapeutic radiographers use radiation to treat cancer and tissue defects and the programme reported on in the study was a very specific type.³⁴ The

Table 2 Characteristics of included studies

	First author	Year	Aim of study	Methods	Profession	Participant type
1	Chesterton ³⁷	2021	To explore new UK graduate physiotherapists' perceived preparedness for clinical practice to provide valuable information to support curriculum development	Mixed method (questionnaire)	Physiotherapists	Newly qualified professionals (n=376)
2	Couto ³⁴	2022	To explore stakeholders' perceptions across four countries regarding underdeveloped competencies of therapeutic radiographers practising on the linear accelerator	Qualitative (interviews)	Radiographers	Other stakeholders (managers) (n=27)
3	Farrelly-Waters ³⁹	2022	To explore the effectiveness of the British and Irish Orthoptic Society preceptorship programme at providing support and confidence in newly graduated orthoptists, and to explore new graduates' experience of embedding public health in their clinical practice	Qualitative (focus groups)	Orthoptists	Newly qualified professionals & other stakeholders (n=7)
4	Harvey-Lloyd ²⁰	2019	To explore the process of being and becoming a diagnostic radiographer	Qualitative (interviews)	Radiography	Newly qualified professionals (n=9)
5	Harvey-Lloyd ²⁸	2018	To explore the experience of newly qualified practitioners in their first post as a radiographer in a range of diagnostic imaging departments in the NHS	Qualitative (interviews)	Radiography	Newly qualified professionals (n=9)
6	Hassett ⁴⁰	2021	To explore whether a UK clinical psychology training programme (the programme) was effective in producing graduates who are confident in leadership, within the context of the NHS and reflecting the British Psychological Society's views of leadership	Mixed method (questionnaire)	Clinical psychologists	Students, newly qualified professionals and experienced professionals (n=92)
7	HCPC ²⁹	2016	To explore 'preparation for practice' of newly qualified professionals who have completed preregistration education and training programmes approved by the HCPC	Mixed method (questionnaire, interviews, focus groups, world cafes)	Mixed (15 HCPC professions and social care)	Newly qualified professionals & other stakeholders (n=101?)
8	HCPC ³⁰	2022	To seek the views of new graduates about their education and training programme, how this prepared them to practice and the first year in employment	Quantitative (questionnaire)	Mixed (15 HCPC professions)	Newly qualified professionals (n=888)
9	Maringer ³⁸	2014	To analyse therapists' experiences of their preceptor role and the skills within this. A further aim was to identify any deficits in preceptors' understanding of the preceptorship purpose and process, in order for these to be addressed to enhance the preceptorship experience for both preceptors and preceptees.	Qualitative (interviews)	Mixed (occupational therapists & physiotherapists)	Other stakeholders (preceptors) (n=6)
10	Naylor ³¹	2016	To explore the expectations and experiences of newly qualified diagnostic radiographers during their transition into practice	Qualitative (focus groups & interviews)	Radiography	Newly qualified professionals (n=4)
11	Reid ³⁵	2019	To compare the perceptions of professional paramedics and their managers on whether newly qualified paramedic students are prepared for practice in the UK and Australia	Qualitative (interviews)	Paramedicine	Newly qualified professionals and other stakeholders (managers) (n=15)
12	Sloane ³²	2017	To critically evaluate the fitness for purpose of newly qualified diagnostic radiography	Qualitative (interviews)	Radiography	Other stakeholders (managers) (n=20)

Continued



Table 2 Continued

	First author	Year	Aim of study	Methods	Profession	Participant type
13	Stevens ³³	2018	This study aimed to specifically assess the confidence of newly qualified radiographers with regard to their ability to recognise (red dot) and describe (PCE) traumatic radiographic abnormalities, as well as how they perceived their undergraduate training in these areas	Quantitative (online survey)	Radiography	Newly qualified professionals (n=85)
14	Thompson ³⁶	2015	To identify the perceived concerns of newly qualified paramedics commencing their careers and how they may be subsequently supported both in university and practice	Qualitative (focus group)	Paramedicine	Newly qualified professionals (n=4)

HCPC, Health and Care Professions Council; NHS, National Health Service; PCE, Preliminary Clinical Evaluation.

study participants agreed that these competencies are essential in undergraduate education and that further training may be beneficial at Masters level for therapeutic radiographers who take on management roles. Some of the interview participants (including employers) did not believe management skills are essential, since these are often covered by postgraduate programmes.³⁴

Therapeutic radiographer graduates were also reported to be underprepared for quality assurance of equipment used to treat patients. This is because the quality assurance is usually done by the physicist and the therapeutic radiographers have more limited basic quality assurance understanding. The suggested reason for this was that students do not have to get signed off as having taking part in those procedures and usually have practical-type sessions.³⁴

Research competencies of newly qualified radiographers were also found to be underdeveloped for many. The implications of this is that they may be unable to create new knowledge to inform their practice. However, there is a strong emphasis placed on evidence-based practice and preparing graduates to apply research results into their practice.³⁴

Paramedicine

A qualitative study of newly qualified paramedics and managers highlighted the robust theoretical knowledge and practical skills of many paramedic graduates particularly anatomy and physiology, treatment modalities and rationale for treatment.³⁵ However, there was also a reported gap between theory and practice for some newly qualified paramedics, that is, learning in a safe classroom environment versus experiencing it in clinical practice.^{35 36} The main knowledge gap identified by participants was clinical decision-making, bringing both theory and practice together.^{35 36} In particular, newly qualified paramedics felt unprepared for making a decision about the care plan for a patient.³⁶ Interviewees suggested that the main reason students did not develop their decision-making skills was because they never had

to take responsibility for the patient as there was always a qualified paramedic present.

All four qualified paramedics who participated in this study reported that they often lacked in confidence when they graduated, particularly in what were seen to be softer skills, that is, people management and decision-making rather than clinical challenges about patient assessment and treatment.³⁶ Some newly qualified paramedics had strong concerns about their registration being at risk, which for some, it had reportedly resulted in defensive practice. This was perceived to be due to their lack of confidence. It was purported that their lack of exposure and experience made them feel more vulnerable.

It was reported by all paramedics and managers that newly qualified paramedics would be very unlikely to operate effectively as an independent practitioner and that they required a period of supervised practice before being able to practise independently.³⁵ Leadership, clinical decision-making and 'putting it all together' were identified as areas where the most work needed to be done by ambulance services as part of the supervised practice period. Participants highlighted that level of responsibility given to students on placement varied from observation only to active participation in patient care and this was based on what the ambulance team members felt would be appropriate for students to do. As a result, the student may not have achieved the outcomes for the placement or reached the required level of competency.

Physiotherapy

A questionnaire study of newly qualified physiotherapists found that physiotherapy programmes generally prepare graduates well for practice against the HCPC standards of proficiency but not for physiotherapy-related clinical skills including exercise prescription, psychosocial skills and patient management.³⁷ It was reported that graduates were well prepared to practise safely and effectively, understanding the key aspects of the knowledge base, as well as communicating effectively within ethical and legal boundaries. However, three HCPC standards of

proficiency were rated by respondents as being 'indifferent'. These included competencies of autonomy, awareness of culture, inclusion and diversity with the ability to draw on knowledge to inform practice.³⁷ A small qualitative study of physiotherapists found that physiotherapy graduates had limited practical experience of working on-call rotas and treating very sick patients in an acute hospital environment.³⁸

Orthoptists

Using focus groups with newly qualified orthoptists and their mentors, the preceptorship programme of the British and Irish Orthoptic Society was explored. This study had a particular focus on the embedding of public health campaigns such as Make Every Contact Count and healthy conversations in clinical practice. They found that it was difficult for newly qualified orthoptists to implement public health behaviours with patients when they first graduated. New orthoptist graduates' lack of confidence was found to be a barrier to embedding public health into clinical practice.³⁹

Clinical psychologists

A questionnaire study found that prospective, current and alumni trainee clinical psychologists reported feeling confident in most leadership skills outlined by the British Psychological Society but that the doctoral programme was effective in developing just under half of the skills.⁴⁰ Participants reported high levels of confidence but low levels of programme effectiveness in the awareness, building and maintenance of interpersonal relationships, an understanding of the emotional impact of change (including resistance), emotional intelligence and/or resilience, and understanding of diversity, values, ethics and integrity. This may have been because individuals developed these skills in other contexts or outside of the taught programme. Participants reported that the programme helped to develop an ability to use evidence, data collection, outcomes and audit to constructively critique current service practice, but participants did not feel confident in this skill. Similarly, participants also indicated a relative lack of confidence in skills in coordinating research teams (supervisors, governance officers, collaborators).

Mixed professions

A questionnaire study of HCPC registrants' preparedness for practice found that 80–92% of respondents agreed that they felt prepared to practice.³⁰ However, there was some disagreement in terms of being prepared for understanding what they need to do to remain registered and receiving the grounding to practice as an autonomous professional. Although these areas equated to <10% of responses overall, paramedics (68–87%) and occupational therapists (66–91%) reported lower levels of agreement.³⁰

A mixed-methods study found that on the whole, the results suggested that newly qualified HCPC professionals

are prepared for practice.²⁹ However, there were some 'other' stakeholders, for example, educators, managers and professionals who felt that the standard of newly qualified professionals is not high enough. Many respondents indicated that the expectations of students needed to be managed before graduating, so that they were aware of the role of a newly qualified professional. There were some concerns about the impact of the variability of both the placement experience as well as the role and training of the practice educator. The findings revealed concern, mainly from service users, that some newly qualified registrants are unable to relate to service users in an appropriate way.

A study of occupational therapists and physiotherapists found that some participants highlighted that newly qualified staff who had undertaken a placement in a similar environment to their first post were quicker to understand the expectations of the job role, clinical reasoning skills and systems of working.³⁸

Cross-cutting themes

We identified four common themes across the professions. The first was around clinical decision-making and taking responsibility, which was key to being an autonomous clinical practitioner. Some newly qualified radiographers had concerns about working in areas where they lacked experience, taking responsibility for themselves and students, and describing abnormalities on a radiograph. In paramedicine, a few were concerned about making a decision about the care plan for a patient, while many physiotherapists felt unprepared for exercise prescription and patient management. The studies of the mixed professions reported some disagreement about receiving the grounding required for autonomous practice. The second common theme across the professions was around leadership skills. These were considered a weak area for some radiographers and paramedics but were a strength for many clinical psychologists. The third theme was around research and critical appraisal skills. Research competencies of radiographers were reported to be underdeveloped and while the clinical psychology programme helped students develop these skills, some did not feel competent in applying these skills to practice. Finally, the fourth theme related to knowledge base in that many physiotherapy and paramedics were prepared for understanding key concepts of the knowledge base.

Mapping evidence to HCPC standards of proficiency

We now present our findings by mapping the data contained in the included papers to the HCPC standards of proficiency (table 3).⁴¹ The majority of studies contained data about being able to practise as an autonomous professional, exercising their own professional judgement, being able to work appropriately with others, being able to reflect on and review practice, being able to assure the quality of their practice, understanding the key concepts of the knowledge base relevant to their profession and being able to draw on appropriate knowledge

**Table 3** Number of studies with data relating to the domains of HCPC standards of proficiency

Standards of proficiency	Reports (n=14) (represents 13 studies)
1. Be able to practise safely and effectively within their scope of practice	6 ^{28 30–33 36}
2. Be able to practise within the legal and ethical boundaries of their profession	4 ^{28 30 37 39}
3. Be able to maintain fitness to practise	3 ^{30 32 37}
4. Be able to practise as an autonomous professional, exercising their own professional judgement	12 ^{20 28–32 34–39}
5. Be aware of the impact of culture, equality and diversity on practice	5 ^{20 28 37 39 40}
6. Be able to practise in a non-discriminatory manner	2 ^{28 37}
7. Understand the importance of and be able to maintain confidentiality	0
8. Be able to communicate effectively	7 ^{28 29 31 32 37 39 40}
9. Be able to work appropriately with others	8 ^{20 28–30 32 36 37 40}
10. Be able to maintain records appropriately	0
11. Be able to reflect on and review practice	9 ^{28 30–32 34 36 38–40}
12. Be able to assure the quality of their practice	9 ^{28–32 34 38–40}
13. Understand the key concepts of the knowledge base relevant to their profession	8 ^{28 32–37 40}
14. Be able to draw on appropriate knowledge and skills to inform practice	14 ^{20 28–40}
15. Understand the need to establish and maintain a safe practice environment	3 ^{34 37 38}
Standards of conduct, performance and ethics	
1. Promote and protect the interests of service users and carers	6 ^{28–30 32 34 39}
2. Communicate appropriately and effectively	7 ^{28 29 31 32 37 39 40}
3. Work within the limits of your knowledge and skills	6 ^{28 30–33 36}
4. Delegate appropriately	0
5. Respect confidentiality	0
6. Manage risk	5 ^{28 33 34 39 40}
7. Report concerns about safety	1 ³⁹
8. Be open when things go wrong	1 ²⁸
9. Be honest and trustworthy	0
10. Keep records of your work	0
Standards of continuing professional development (CPD)	
1. Maintain a continuous, up-to-date and accurate record of their CPD activities	2 ^{28 39}
2. Demonstrate that their CPD activities are a mixture of learning activities relevant to current or future practice	3 ^{28 30 34}
3. Seek to ensure that their CPD has contributed to the quality of their practice and service delivery	2 ^{28 38}
4. Seek to ensure that their CPD benefits the service user	0
5. Upon request, present a written profile (which must be their own work and supported by evidence) explaining how they have met the standards for CPD	1 ³⁹

HCPC, Health and Care Professions Council.

and skills to inform practice. Very few studies addressed the standards of continuing professional development (CPD), which is the way in which professionals continue to learn and develop throughout their careers in order to keep their skills and knowledge up to date to practise safely and effectively.⁴²

Quality of included reports

The majority (n=9) of included reports were of low to medium quality with an average of 23 out of a total score

of 39 (59%).¹⁰ This compares with a score of 90% in another published review which used a modified version of this tool with one additional item. This review classified its included studies as high quality.⁴³ The highest scoring item on the tool was item 11 (the method of analysis was appropriate to answer the research aim/s). The lowest scoring item on the tool was item 10 (justification for analytical method selected) with no studies sufficiently reporting this item. Quality assessment results

for individual items are graphically presented in online supplemental appendix B.

DISCUSSION

Statement of principal findings and comparison with existing literature

This systematic review of the literature set out to understand how well newly qualified AHPs are prepared for practice in the UK. The review identified a paucity of research on this topic and demonstrated that the majority of what is available is of medium to low quality. While there is some qualitative research on radiography, paramedicine, physiotherapy, clinical psychology and orthotics, along with some high-level views on overall preparedness across all 15 professions, there is little or no evidence on the remaining professions. The limited available evidence tentatively suggests that many graduates reported feeling adequately prepared for practice, with each profession having different strengths and weaknesses in key areas of practice.

The lack of studies carried out on preparedness for practice in AHPs is understandable for some of the professions as several are very small⁴⁴ and thus available resources to carry out research may be limited, for example, prosthetist/orthotist, hearing aid dispensers, arts therapists, chiropodists/podiatrists and clinical scientists. However, it is surprising that there is not more research on the larger professions,⁴⁴ particularly physiotherapy, paramedicine and occupational therapy. This may be because this area of research is not considered a priority compared with other areas. Further research is needed on preparedness for practice in AHPs, particularly the under-researched professions as outlined above. Furthermore, studies that focus on developing concepts and validated tools to measure preparedness for practice would provide further insight into the adequacy of preparedness, as graduates feeling prepared for practice is not necessarily the same as graduates being prepared for practice, that is, they might not know what they do not know.

The fact that newly qualified radiographers experience such a reality shock and that they did not realise how busy the imaging department was raises the question as to why their clinical placements did not make them aware of their future work environment. This may be due to having to work overtime to help deliver a busy service. Or it may be related to the fact that due to the need for supervision and their supernumerary status as a student, clinical education can only prepare students so much for the reality of practice as taking responsibility feels different when you are qualified.⁴ This is concerning because if departments are already too busy to enculturate graduates into practice, this issue is going to be further exacerbated when student numbers increase as has been stipulated by the 2023 National Health Service Long Term Workforce Plan.⁴⁵

A striking finding was how concerned some paramedic graduates were about their registration being at risk and their adoption of defensive practice. Perhaps this finding is indicative of a blame culture within paramedicine, although we did not find any evidence to support this. Junior staff often suffer in such cultures, as one of the weakest links in the chain, and it has been found that a number of organisational level changes are often required for newly qualified staff to thrive.⁴⁶ However, it is important to bear in mind that this study was based on one focus group with a relatively low number of participants (n=4). This finding was absent from the other professions and the preparedness for practice literature on doctors. However, it was also found in a report on dental graduates' preparedness for practice.⁴⁷ Defensive practice refers to behaviour by clinicians that mainly aims to reduce their perceived legal or reputational risks, rather than to advance patient care.⁴⁸ Defensive practice is of two general types: avoidance-type behaviour, where clinicians avoid practice areas, patients or procedures considered to involve higher medicolegal risks; and hedging-type behaviour, where clinicians provide tests, procedures, referrals and other interventions 'just in case' they may reduce legal or reputational risks.

One of the studies on radiographers highlighted that sometimes graduates need to develop new competencies if they end up practising in cross-sectional imaging as current radiography education is focused on projectional radiography.³² Due to the fast-paced ever-changing environment that healthcare is now typically delivered in means, it is very difficult to prepare graduates for all eventualities, so equipping them with skills for lifelong learning is essential. It is also important that lifelong learning is an important facet of the concept of preparedness for practice whereby clinicians need to be prepared for their whole career as well as when they start practising.⁶ The mapping exercise found that very few studies addressed the standards of CPD implying that this was not perceived as being important when researching preparedness for practice. We recommend that any future research on preparedness for practice in AHPs uses this broader conceptualisation and investigates preparedness for lifelong learning along with preparedness for initial practice.

Strengths and limitations of the study

A strength of this review was that it was rigorously conducted following CRD guidelines which resulted in a comprehensive narrative synthesis of 14 reports. Furthermore, the review was reported using the PRISMA 2020 checklist ensuring transparency. Finally, the review was conducted by an MDT of people with social science and clinical (medicine, chiropractic, paramedic, biomedical scientist and dietitian) backgrounds.

The main limitation of the review is that the summary of evidence derived from a review can only be as good as the literature it finds. Thus, as there is limited availability of literature on this topic and the majority of included studies were self-report, we were not able



to comprehensively address the review question. The studies were not 100% independently double-screened, extracted or quality assessed; however, a 10% sample for each process was completed, compared and discussed fully with few disagreements.

CONCLUSION

The limited availability, and in many professions the complete absence, of research on newly qualified AHPs' preparedness for practice means we do not have a clear picture of whether preregistration education is preparing these professions adequately for practice. This will make decisions about how education provision can be improved very difficult. Much more high-quality, in-depth research is urgently needed across all allied health professions to elucidate the specific roles, their nuances and areas of underpreparedness. It is also important to understand the transition into early clinical practice, ongoing learning opportunities through work, and the supervision and support structures in place. A qualitative study drawing on multiple perspectives including newly qualified registrants, other stakeholders involved in their education and supervision in the workplace and patient views would be a suitable study design to investigate these topics.

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Contributors NB, LB, KM, TH, KW and TG designed the study. LB, NB, TH and KM developed the search strategy for the study. LB and TH undertook the searches. NB and LB conducted the screening, data extraction and quality assessment. NB and AM conducted the synthesis. NB undertook the first draft of the manuscript. NB acts as a guarantor and accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish. All authors reviewed and revised the manuscript and all authors approved the final version.

Funding This study was funded by the Health and Care Professions Council.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study did not require ethical approval as it does not involve human participants.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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