

Balancing health care education and patient care in the UK workplace: a realist synthesis

Sarah Sholl,¹ Rola Ajjawi,² Helen Allbutt,³ Jane Butler,⁴ Divya Jindal-Snape,⁵ Jill Morrison⁶ & Charlotte Rees⁷

CONTEXT Patient care activity has recently increased without a proportionate rise in workforce numbers, impacting negatively on health care workplace learning. Health care professionals are prepared in part by spending time in clinical practice, and for medical staff this constitutes a contribution to service. Although stakeholders have identified the balance between health care professional education and patient care as a key priority for medical education research, there have been very few reviews to date on this important topic.

METHODS We conducted a realist synthesis of the UK literature from 1998 to answer two research questions. (1) What are the key workplace interventions designed to help achieve a balance between health care professional education and patient care delivery? (2) In what ways do interventions enable or inhibit this balance within the health care workplace, for whom and in what contexts? We followed Pawson's five stages of realist review: clarifying scope, searching for evidence, assessment of quality, data extraction and data synthesis.

RESULTS The most common interventions identified for balancing health care professional education and patient care delivery were ward round teaching, protected learning time and continuous professional development. The most common positive outcomes were simultaneous improvements in learning *and* patient care or improved learning or improved patient care. The most common contexts in which interventions were effective were primary care, postgraduate trainee, nurse and allied health professional contexts. By far the most common mechanisms through which interventions worked were organisational funding, workload management and support.

CONCLUSION Our novel findings extend existing literature in this emerging area of health care education research. We provide recommendations for the development of educational policy and practice at the individual, interpersonal and organisational levels and call for more research using realist approaches to evaluate the increasing range of complex interventions to help balance health care professional education and patient care delivery.

Medical Education 2017; 51: 787–801
doi: 10.1111/medu.13290



This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

¹Business School, Edinburgh Napier University, Edinburgh, UK
²Centre for Research in Assessment and Digital Learning, Deakin University, Burwood, Vic., Australia
³Planning and Corporate Governance, NHS Education for Scotland, Edinburgh, UK
⁴Health Education England – Kent, Surrey and Sussex, Crawley, UK
⁵School of Education and Social Work, University of Dundee, Dundee, UK

⁶Institute of Health and Wellbeing, College of Medical, Veterinary and Life Sciences, University of Glasgow, Glasgow, UK
⁷Faculty of Medicine, Nursing and Health Sciences, HealthPEER (Health Professions Education and Education Research), Monash University, Clayton, Vic., Australia

Correspondence: Sarah Sholl, Business School, Edinburgh Napier University, 216 Colinton Road, Edinburgh EH14 1DJ, UK.
Tel: 0131 455 4259; E-mail: s.sholl@napier.ac.uk

 INTRODUCTION

In common with health care services elsewhere in the world, such as the USA,^{1–3} the UK National Health Service (NHS) faces unprecedented financial and workforce challenges as a result of rising demand for services and constrained resources.^{4–6} There are particular pressures in specialty areas such as accident and emergency,⁷ general practice^{4,6,8} and mental health⁶ because of insufficient funding and a shortage of staff to fill vacant posts.⁹ Against this contextual backdrop, it is perhaps unsurprising that time for health care professional education within the NHS is often at a premium. Indeed, according to the General Medical Council's (GMC's) National Training Survey, 36.4% of trainers disagree that they can always use the time allocated to them as an educator specifically for education.¹⁰ Furthermore, only 55.8% of trainers expressed confidence that their Deanery or Local Education and Training Board worked collaboratively to ensure that the educational needs of doctors in training were balanced with service commitments.¹⁰ Medical trainees also cite work pressures and staffing levels as areas of concern.¹¹

Such system challenges impact directly on the education of health care professionals. When services are under pressure, time and resources for education are the first to be sacrificed.⁶ Although health care education in the UK is generally held in high regard,^{6,12,13} poor quality training (i.e. low standard, rushed or interrupted training) is associated with a higher likelihood of patient safety incidents⁶ and working environments that are not conducive to learning and continuous improvement. A large Department of Health-funded research programme into NHS organisations in England, for example, found that staff in overworked and poorly structured teams were more likely to be employed in areas with higher patient mortality, to be task rather than patient-focused, and to prioritise factors such as targets and cost-efficiency over quality, education and safety of care.¹⁴ By contrast, those who worked in supported, well-organised settings, despite feeling pressured, were able to commit to learning and innovation and deliver high-quality care.¹⁴

Achieving an appropriate balance of health care professional education with patient care delivery in NHS workplaces, therefore, has become a high-priority area in UK medical education research (MER).^{15,16} Dennis *et al.*¹⁵ defined this balance as 'the pressures that exist or are perceived to exist

between delivering service to patients and providing training [to learners]' (p.21). Practice learning is already a core component of pre-registration, post-registration and continuing professional development (CPD) programmes for health care employees. However, because of the scale of the pressures on the NHS, there is increasing demand for approaches that maximise the workplace as a learning environment in order for learners to develop skills and competencies with flexible and innovative technology and other modes of educational delivery.¹³

Our initial exploration of the topic of balancing education and service found one qualitative review published in 2003 about the effects of working patterns on the training of junior doctors in the UK.¹⁷ It described changes in work patterns as a result of increasing demands for health care provision and the resulting impact on the availability and effectiveness of education. Although this paper provided useful insights into the effect of working patterns (as a result of service delivery demands) on health care professional education, its methods were rather unclear; a sole researcher (rather than a team) conducted the review and the review referred only to junior doctors rather than the broader health care team. Given the limits of this review, we chose to conduct an up-to-date, team-based, realist synthesis of the literature in order to identify and understand the types of interventions used to balance health care professional education with the delivery of patient care in the UK, and to determine what works, for whom and under what circumstances.

Conceptual framework

We considered realist synthesis to be the most appropriate method for identifying and understanding how complex interventions can work to balance health care professional education with patient care delivery.¹⁸ Articulating the link between the context (C) in which these interventions work, how they work (i.e. mechanisms) (M) and the outcomes (O) that are produced affords a more in-depth insight into the interventions under scrutiny and allows their effectiveness to be optimised (see glossary in Box 1). Indeed, a realist synthesis provides an important step towards understanding workplace-based interventions, for whom they work, why and under what circumstances. Although the CMO approach is not necessarily linear (e.g. interventions may work in more than one way in a particular context) and cannot cover all possibilities, it can help to explicate the complexities around why

interventions do or do not produce their effects and is, therefore, useful in policy-making contexts.¹⁶ Aligned with a realist approach, we present the findings of two key research questions from our initial exploration of this topic, as follows. (1) What are the key workplace-based complex interventions that influence the balance between health care professional education and patient care delivery? (2) In what ways do interventions enable or inhibit this balance within the health care workplace, for whom and in what contexts?

METHODS

We developed a peer-reviewed protocol, which has been published¹⁷ and is underpinned by Pawson's five stages of realist review: (1) clarifying scope, (2)

searching for evidence, (3) assessment of quality, (4) data extraction and (5) data synthesis.¹⁹ Our methods also follow the RAMESES reporting guidelines developed by Wong *et al.*²⁰ Please see Box 1 for a glossary of terms.

Clarifying the scope

We first clarified the scope of our realist synthesis by identifying relevant interventions (e.g. protected study time, workplace learning, bedside teaching encounters, etc.), which generated numerous search terms (see stage 2 below). Like other realist syntheses [e.g.^{21–23}] ours considered a multiplicity of different interventions rather than one intervention, with some of our interventions combining education and service simultaneously (such as ward rounds) and others separating out education and

Box 1 Glossary of terms (in alphabetical order) relating to realist syntheses and interventions

Caseloading: a model which 'aims to ensure that the woman receives all her care from one midwife or practice partner'. Sometimes referred to in the literature as 'caseload midwifery'.⁶⁷

CMO configuration: 'a context-mechanism-outcome (CMO) configuration seeks to spell out the relationship between identified features of each'.²¹

Contexts: 'context describes the setting in which a particular outcome is being studied'.²¹

Continuing professional development (CPD): the learning activities professionals engage in to develop and enhance their abilities. It enables learning to become conscious and proactive, rather than passive and reactive'.⁶⁸

Demi-regularity: 'semi-predictable patterns... "semi" because variations in patterns of behaviour can be attributed partly to contextual differences from one setting to another'.⁶⁹

European Working Time Directive: 'an EU initiative designed to prevent employers requiring their workforce to work excessively long hours, with implications for health and safety'. Also known as the Working Time Regulations.⁷⁰

Grey literature: 'that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers'.⁷¹

Mechanisms: 'mechanism is used in realism to describe the causes, processes or agents and structures within a social setting that lead an outcome to arise, specifically mechanisms describe the sequences of actions, events, interactions and subsequent events that lead to the generation of particular outcomes in particular contexts'.²¹

Outcomes: 'outcome describes the desired product of an intervention or interaction that is designed to trigger it'.²¹

Programme theories: 'the ideas and assumptions underlying how, why and in what circumstances complex social interventions work'.⁵⁹

These can be expressed as **context-mechanism-outcome** (CMO) configurations.

Protected learning time: 'a period of time allocated for learning activities which are not meant to be interrupted by clinical duties'.⁷²

Realist synthesis: realist synthesis is a 'strategy for synthesising evidence and providing explanations (programme theories) on why interventions may, or may not, work (i.e. how and in what circumstances'.²² As suggested by Wong *et al.*,²⁰ it is a 'theory-driven method that is firmly rooted in a realist philosophy of science... [placing] particular emphasis on understanding causation'.

Relevance: 'whether it [paper] can contribute to theory building and/or testing'.²⁰

Rigour: 'whether the method used to generate that particular piece of data is credible and trustworthy'.²⁰

Ward round: 'a complex clinical process during which the clinical care of hospital inpatients is reviewed'.⁴⁰ Although some ward rounds are more service-orientated, others can be more teaching-orientated, for example, 'ward round teaching is in fact a kind of clinical training in which lecturers and the medical team come together around the patient's bed and assess the patient's condition while the medical team is taught by the lecturer'.⁷³

service (such as protected learning time). Therefore, our initial programme theory was best described as ‘rough’, like others.²¹ We speculated that interventions (e.g. protected learning time) could be effective for health care professionals (e.g. postgraduate medical trainees) in the workplace (e.g. primary care setting) in balancing education and service through mechanisms at the individual (e.g. learner motivation and attitude), interpersonal (e.g. social environment such as leadership) and organisational levels (e.g. logistical pressures such as access to education).¹⁶

Searching for empirical evidence

We gathered evidence in the form of journal articles, reports and grey literature (see Table S1 for a summary of the types of literature and sources searched). We searched databases in the following order: Medline, ERIC, Scopus, CINAHL, Web of Science and PsycINFO. Although we know that Scopus includes Embase, which in turn includes Medline, we decided to begin with Medline in order to facilitate the iterative process of refining the search terms, making use of the ability to ‘explode’ MeSH (Medical Subject Heading) terms, which is not possible with Scopus. We discussed broad search terms as a research team and these were then iteratively refined with the help of a health care services librarian experienced in expert searching (see acknowledgements).

Table S2 illustrates the MeSH terms and key phrases generated for database searches.

We agreed various inclusion criteria as a research team, with respect to topic, recency and geographic spread (see Table S3). We chose the introduction of the European Working Time Directive in 1998 as an appropriate date for searching, because ‘time’ was one of the most frequently identified influencing factors in the papers we examined in our initial exploration of the literature. Although research exploring the balance between education and service in health care exists across different countries [e.g.,^{1,3,24}] we were mindful that factors influencing the balance of education and service would be context specific, so we decided to focus our review on the UK only. We therefore searched databases for English-language UK articles published from 1998 onwards, in line with the established protocol. Note that our inclusion criteria did not change throughout our data gathering stage.

The first top-level search elicited 2619 journal articles across all databases. Once duplicate results were removed and agreed study parameters reinforced (for example, it was noted that some studies from before 1998 had been incorrectly categorised in the databases), 343 articles remained. The searching and selection process is summarised in the PRISMA diagram (see Figure 1).

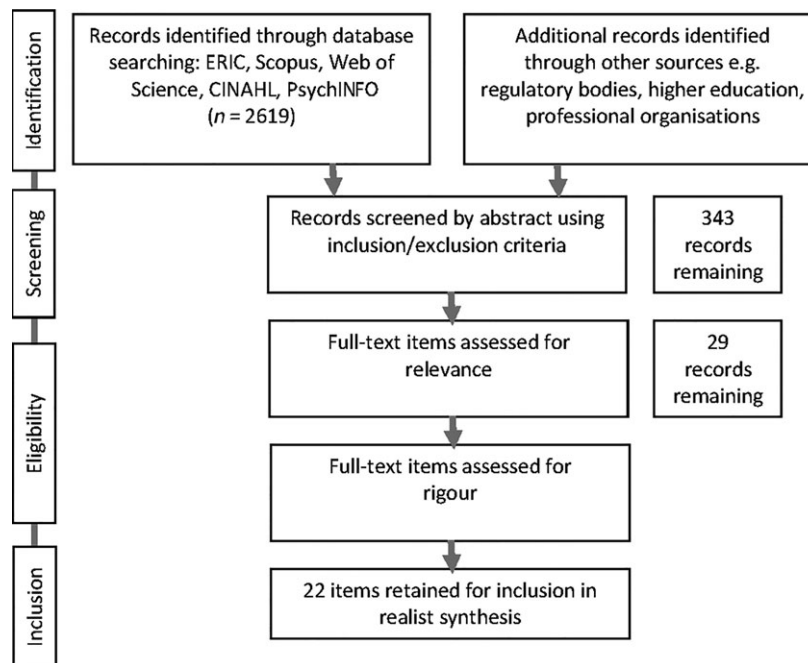


Figure 1 PRISMA flow diagram of the selection process⁶⁶

Assessment of quality

We (SS, HA and JM) assessed the journal articles for relevance and rigour, as recommended by other authors.¹⁹ For the purposes of this study, we defined 'relevance' as '[articles] which provide data that inform programme theory development and refinement'.¹⁶ We (SS, HA and JM) initially assessed relevance by reviewing abstracts using preliminary inclusion criteria. If one of us found any ambiguities, abstracts were checked by one of the other two researchers. Ten per cent of these 343 articles were double-checked by an additional two researchers (RA and CR), including a number of articles previously excluded (for quality control purposes).

Following the assessment of relevance, 29 articles remained and these were then assessed for rigour. Assessment of rigour followed the same process, this time reviewing the whole journal article. We defined 'rigour' as '[determining] whether the methods used to generate the relevant data are credible and trustworthy'.^{16,25} We (SS, HA and JM) resolved differences in opinion by negotiation at this stage, and found that no adjudication was necessary.

Following the assessment of rigour, 22 articles remained. These consisted of 16 qualitative observational studies (interviews, questionnaires and focus groups), two quantitative database studies and four literature reviews. At this stage, we discussed whether the identified grey literature fell within the definitions of both relevance and rigour. We felt that some of the grey literature that would be useful in informing the study might not be included given our focus on both relevance and rigour. In addition, not all of the literature formats lent themselves to realist coding processes. It was, therefore, decided that although journal articles would form the basis of the coding and analysis, grey literature would be taken into account once key interventions and initial CMO configurations had been identified to provide important contextual information to the findings. Therefore, grey literature was not subject to the extraction and synthesis process.

Data extraction

We adopted an inductive approach to data extraction. Three of us (SS, RA and CR) read a sample of six articles and developed an initial set of codes (interventions, contexts, mechanisms and outcomes) through discussion and negotiation. In order to elicit these codes, we asked the following questions.

(1) What conditions are needed for an intervention

to trigger mechanism(s) to produce outcome(s)? (2) What is it about an intervention that may lead to particular outcomes in given contexts? (3) What are the practical effects produced by causal mechanisms being triggered in given contexts?²⁶ As a result, the CMO configurations (see glossary Box 1) in all 22 articles were identified and therefore constructed by members of the author team. Approximately one-third of the articles were coded by one researcher and six of the articles were also coded by all three researchers. Development of the coding framework was therefore iterative, with repeated discussion among the researchers of the demi-regularities (i.e. patterns of CMO configurations: see glossary in Box 1) and negotiations of any differences of opinion.

Data synthesis

Finally, we interrogated our coding to look for patterns in our data. We compared and contrasted our findings with our rough initial programme theory (see above) in an attempt to test and further refine programme theories.

RESULTS

Table S4, available online, presents the 22 articles and summarises the methodology, interventions, contexts, mechanisms and outcomes identified in each article.

Interventions

Several candidate interventions were identified in the articles, namely: protected learning time (PLT), CPD, ward round teaching, leadership, caseloading, critical care skills training and experiential learning. These interventions were reported at various levels of focus, which could be categorised as individual, interpersonal or organisational levels.

Outcomes

Both positive and negative outcomes for the above interventions were identified across the articles. Positive outcomes included: maximised learning opportunities^{21,27-29}; new knowledge and/or skill acquisition^{30,31}; improved workforce flexibility³²; improved patient care, safety and/or outcomes^{21,29,30,32-37}; reduced waiting times³²; peer-to-peer learning^{38,39}; staff cohesion and/or networking⁴⁰⁻⁴²; deep learning³⁰; improved performance and practice^{33,36}; revalidation supported^{30,33}; feelings of

satisfaction and valued contribution^{21,27}; and balance of learning and service delivery maintained.^{21,32} Negative outcomes included: hindered learning opportunities^{27,30,43}; undermined patient confidence^{27,29}; perceptions of inadequacy and/or failure,³⁰ exhaustion³⁰ and lack of engagement^{44,45}; and increased workload.^{38,39,42} It is noted that although the negative outcomes tend to mirror some of the positive outcomes, there were many more positive outcomes identified in the articles than negative outcomes. Box 2 shows examples of these outcomes in the included studies.

Contexts

A number of contexts were noteworthy with respect to intervention and outcome; namely, age group of learners,³⁶ presence or absence of patient,^{27,29} medicine (as distinct from other professions)⁴² and location.^{33,36} Other contexts were reported as not being important with respect to intervention and outcome; namely, level of staff experience,³⁷ specialty,^{36,37} gender³⁶ and type of contract.³⁶ We identified contexts at the individual, interpersonal and organisational levels. Contexts at the individual level included: nurses⁴⁵; midwives³⁰; allied health care professionals^{32,34,37}; junior doctors and medical students^{21,27,29,33,43,46}; trainees^{21,28,33,35,43,46}; 'hospital doctors'^{21,33,46}; community nurses⁴⁴; GP

administrative staff^{38,39}; and CPD organisers.⁴² Contexts at the interpersonal level included: primary care teams^{41,42,47}; and multidisciplinary teams.³¹ At the organisational level contexts included: hospital^{21,29}; general practice^{21,45}; ward round^{27,28}; increased patient numbers³⁵; and rapid NHS change.⁴⁷ See Box 2 for examples of these contexts in the included studies.

Mechanisms

A wide range of mechanisms was reported across the articles. Interestingly, something reported in one article as an intervention, such as PLT,^{33,37} may be reported elsewhere as a mechanism.^{38,39,41,42,45} We identified positive and negative mechanisms at the individual, interpersonal and organisational levels. In terms of positive mechanisms at the individual level we identified: increased awareness of opportunity³³; recognition of capacity to learn and/or mobilising knowledge⁴⁷; attitudes to learning and/or active participation^{27,32}; perception of value and/or relevance^{31,35,38,39}; enthusiastic and motivated trainers^{43,46}; targeted, quality teaching^{28,43,45,46}; integration of service, experience and training^{21,29,31}; and effective communication.^{27,38,39,43,46} At the interpersonal level, we identified numerous positive mechanisms including: discussion time away from patients²⁷⁻²⁹; student-

Box 2 Examples of outcomes, contexts and mechanisms (in bold font) identified in the literature.

Outcomes

CPD is a multifaceted activity, which needs to be fully integrated into the workplace at organisational, departmental, and individual levels in order for its full potential to be translated into **high quality service delivery and patient care**.³⁴

... lack of time, preparation and awareness of the learning opportunities combined with a perceived feeling of being uninvolved **hindered the learning opportunities available** on WRs.⁴³

Contexts

Protected learning time (PLT) is an established method of allowing **primary care teams** time to learn together.⁴²

What was seen as effective leadership behaviour in times of stability... is now seen as insufficient to meet staff needs **during times of rapid change**.⁴⁷

Mechanisms

Successful CPD is an essential component of medical practice and requires **adequate awareness and information, and the availability of time, cover, and appropriate funding and educational opportunities** in order for doctors to fulfil their requirements'.³³

Community nurses felt aggrieved at the **lack of protection from service delivery** they perceived they had for PLT afternoons'.⁴⁴

CPD, continuous professional development; WR, ward round

patient relationship³⁰; mentoring³⁰; integration of service, experience and training^{21,29,31}; and effective communication.^{21,38,39,43,46} Finally, at the organisational level, we identified the following positive mechanisms: adequate support^{28,31–33,35}; sufficient funding^{32,33,35}; protected time^{21,33}; structured ward round (WR) teaching^{28,43,46}; effective leadership⁴⁷; training information made available³³; location with respect to CPD³³; good access to training⁴¹; integration of service, experience and training^{21,29,31}; and effective communication.^{28,38,39,43,46}

In terms of negative mechanisms at the individual level, we identified: lack of awareness of learning resources^{34,37}; perceived lack of support^{34,37,42,43}; perceived irrelevance of CPD^{31,44}; perceived workload too high^{30,34,37,42,43}; and anxiety and stress.³⁰ With respect to negative mechanisms at the interpersonal level, we identified: trainers can stifle trainees.²⁸ Finally, in terms of the organisational level, we identified the following negative mechanisms: lack of funding^{34,37}; pressures on service^{35,37}; lack of protection from service obligations⁴⁴; lack of support^{34,37}; lack of staff cover⁴⁵; short placements³⁰; and single-handed roles.⁴⁵ See Box 2 for examples of both positive and negative mechanisms.

CMO configurations

Across the 22 articles, we identified 23 key CMO configurations (for examples see Box 3; a more extensive list is available online in Box S1). A number were very similar to each other, varying either in context or in the intervention to which the CMO configuration applied.

Similar to Williams *et al.*,⁴⁸ we next present the top three most frequently mentioned configurations across the articles, including excerpts from the relevant articles, and compare these with our rough initial programme theory, in order to test and refine programme theory.

CMO1

In the primary care context [C], effective CPD [I] can lead to better performance and service delivery, a more flexible workforce, reduced waiting times and improved patient outcomes [O], if barriers such as funding, support, staff cover and workload can be overcome [M].^{32–37,42,43}

It is clear from the literature that a combination of several factors is required at the organisational level in order for CPD to be effective for health care professionals:

Successful CPD [I] is an essential component of medical practice and requires adequate awareness and information [M], and the availability of time, cover, and appropriate funding and educational opportunities [M] in order for doctors to fulfil their requirements [O]. The information needs of individuals must be addressed, but organisational support [M] for CPD is also required.³³

Supportive organisational leadership [M] is necessary to fund, value and support nurses' professional development requirements and as an investment in patient safety and nurse retention [O].³⁵

Box 3 Examples of identified configurations; AHP, Allied Health Professional.

Effective [O] ward rounds [I] for students and foundation doctors [C] include targeted, limited and quality teaching, few interruptions, teacher enthusiasm and effective communication [M].^{43,46}

In primary care [C], PLT and reflective practice [I] enable the balance of learning and patient care [O] through mobilising principles of learning organisations through effective leadership and empowerment [M].⁴⁷

Trainee-centred ward rounds [I] can facilitate learning and improve learner satisfaction [O] of junior doctors [C] if there are agreed learning objectives, active participation and good trainer–trainee communication [M]. They will not be effective [O] if there is insufficient time or lack of encouragement for active participation [M].²⁷

CPD [I] for AHPs [C] should improve practice and service delivery, benefit service users, reduce waiting times and increase flexibility of the workforce [O]. Attitude to CPD is an important success factor, as are organisational support and sufficient funding [M].³²

[I] = intervention, [C] = context, [M] = mechanism, [O] = outcome. PLT, protected learning time; CPD, continuous professional development.

It is also noted that successful CPD does not operate in isolation; rather, it requires coordination at all levels and translational efforts in order to be effective:

CPD [I] is a multifaceted activity, which needs to be fully integrated into the workplace [M] at organisational, departmental, and individual levels in order for its full potential to be translated into high quality service delivery and patient care [O].³⁴

Perhaps for this reason, workload pressures and lack of funding are still seen as barriers even if organisational support is evident. High levels of support for CPD are not necessarily reflected in the ability of an organisation to provide it effectively:

Despite the organisational support [M] for CPD [I], respondents faced substantial challenges in accessing CPD when under pressure to achieve productivity targets [M], with little assistance in terms of funding [M].³⁷

However, supportive organisational leadership through funding and valuing CPD and post-CPD support can lead to improved outcomes, even in the face of increased workload.^{32–37} Support at the interpersonal level was conceptualised as empowering staff to change their practice based on CPD activities.^{35,49} This focus on ‘learning transfer’ to the workplace from the undertaking of targeted CPD activities was notable in the nursing literature.^{35,49}

Interestingly, although CMO1 was consistent with our rough initial programme theory about effective interventions (see earlier), CMO1 better articulates the multiplicity of outcomes for CPD in a primary care setting, including both improved learner and patient outcomes. Although CMO1 aligned with our initial programme theory in terms of how CPD works through multiple individual, interpersonal and organisational mechanisms, CMO1 primarily emphasises mechanisms at the interpersonal and organisational levels for CPD. See Figure S1 online for our visual representation of our refined programme theory for CPD.

CMO2

Ward rounds [I] are important because they provide learning and service simultaneously [O]. Scheduled discussion time away from patients [M] during ward round teaching can increase learning opportunities, build upon opportunistic

discussions, contribute to team cohesion and avoid undermining patient confidence [O], particularly if active participation, integration of service, experience, training and feedback, and enthusiastic teachers are present [M]. Lack of time, awareness and opportunity for discussion [M] hinders these learning opportunities [O].^{21,27–29,43,46}

Planning and engagement at all levels is vital in order to make the best possible use of WRs and therefore to maximise opportunities for learning:

Trainee-centred ward rounds [I] do appear to be effective in overcoming barriers to learning and did help improve learning opportunities, and thus satisfaction [O] for junior doctors [C] in a busy workplace [C]. However, ward rounds consist of a series of complex tasks that require more than just medical knowledge, namely, interpersonal, clinical-technical, patient-management, and communication skills [M]. A good structure [M] can help maximise the learning [O] that could take place during ward rounds [I].²⁷

The very clinical environment that makes a WR such a valuable source of experiential learning is also a source of potential barriers to its success:

Despite the emphasis on clinical teaching, many WRs [I] remain service driven, their educational value hindered [O] by lack of time, noisy wards, patients not being available, reduced training time and a rising workload [M].⁴³

Ward-round teaching [I] is a useful education tool that is often challenged by the burdens of the clinical environment [M].⁴⁶

The balance of health care professional education with patient care delivery should consequently be considered from two aspects; namely, maintaining the balance under challenging circumstances, and maximising the opportunities that such circumstances provide. It is therefore important that trainers and trainees are also ready to take full advantage of the learning opportunities afforded by a well-structured WR where learners feel safe to actively contribute to discussions²⁸:

Medical education [O] relies heavily on experiential learning [I]. Therefore learning and health-care delivery are concurrent in clinical

workplaces [M]. Professionals in primary care training sites [C] must reconcile the goals of providing individualised health care with the provision of constructive workplace-based learning for future professionals [M].²¹

It is important to also note that, from the clinical perspective [C], learning from experience [I] is dependent on “readiness for change” as transformation requires assimilation and accommodation [M].²¹

Discussion time away from patients during ward rounds can increase learning opportunities, build upon opportunistic discussions and avoid undermining patient confidence when giving direct feedback to trainees.^{27–29}

We can see that CMO2 was more or less aligned with our rough initial programme theory regarding effective interventions. Like CMO1, however, CMO2 better enunciates the multiplicity of outcomes for WRs in hospital settings, including both improved learner and patient outcomes (particularly in the case of scheduled discussion time away from patients). CMO2 also aligned with our initial programme theory in terms of identifying multiple mechanisms at individual, interpersonal and organisational levels for how WRs work. See Figure S2 for our visual representation of our refined programme theory for WRs.

CMO3

Protected learning time (PLT) [I] in primary care [C] can lead to updated knowledge and skills and improved teamwork and relationships [O] for all staff categories [C], but only if it is perceived to be relevant and valuable, and if there is effective communication and protection from service delivery obligations [M].^{31,38,39,41,44,45}

Studies have shown that PLT [I] is generally well received [O] but that different professional and occupational groups [C] have varying perceptions and experiences of PLT [O].⁴⁴

It is notable that much of the existing research in this area is based on staff members’ perceptions of their own learning needs and the barriers that they face; yet these perceptions may not necessarily give rise to an accurate assessment of the same.³⁶ The benefits of effective PLT are documented at personal, interpersonal and organisational levels:

Protected learning time (PLT) [I] offers the opportunity for members of the primary care team within a primary care trust (PCT) [C] to meet to update their own knowledge, learn from each other and enhance team working in both their practice and the PCT [O].³¹

‘Protection’ and ‘time’ are the operative words here; without adequate resourcing and opportunity for learning without distraction, PLT is of limited use. All too often the freedom from such distraction appears to be found by undertaking professional development in the individual’s own time.^{39,44} In this respect, PLT differs from WR learning: WRs take advantage of the existing clinical environment as the ‘classroom’, and therefore embrace and anticipate the difficulty of balancing health care professional education with patient care delivery. PLT requires the learner, or the learning team, to be ‘protected’ from the work environment, and the balance of learning and care must be managed in order to enable PLT to take place.

Although CMO3 was also consistent with our rough initial programme theory about effective interventions (see earlier), CMO3 also better articulates the multiplicity of outcomes for PLT in a primary care setting, focusing especially on learner-orientated outcomes such as enhanced team working. Similarly, CMO3 was more or less consistent with our initial programme theory in terms of how PLT works through multiple individual, interpersonal and organisational mechanisms. See Figure S3 for our visual representation of our refined programme theory for PLT.

DISCUSSION

Key findings and comparison with existing literature

In terms of our first research question (the workplace-based complex interventions designed to help balance health care professional education and patient care delivery) we identified various interventions in the reviewed studies, the most common being the ward round (WR), protected learning time (PLT) and continuing professional development (CPD). Of these three most common interventions, only one (WR) attempts to simultaneously balance health care professional education and patient care delivery, whereas the other two (PLT and CPD) try to balance education and service by keeping these two activity types

distinctly separate, so that neither encroaches on the other.⁵⁰ Indeed, we have previously found through the lens of cultural-historical activity theory (CHAT),⁵¹ that although education and service are overlapping activity systems within the health care workplace, the juggling of these two activity systems (with their sometimes contradictory roles, routines, materials and divisions of labour) can both inhibit and create opportunities for workplace learning.⁵⁰ The ward round can be seen as an example of experiential learning, considered an intervention in the Yardley *et al.* review.²¹ Indeed, they defined 'experiential learning' as any learning arising from workplace-based interactions, that is, the creation of meaning or construction of knowledge from 'real life' experiences. We make the distinction between WR and PLT/CPD here as the literature we reviewed on balancing health care professional education with patient care delivery tended to privilege formal (e.g. planned or structured) rather than informal (e.g. unplanned or unstructured) learning opportunities and conceptualisations of education and service that understand them as separate activities rather than as deeply intertwined activities, such as viewing service as education and vice versa.^{2,3,52,53}

In terms of our second research question (to what extent the interventions work for whom, in what circumstances, and why) we identified more positive than negative outcomes for the interventions across the reviewed papers, which might partly reflect publication bias, with positive findings being more likely to be published in the literature than negative findings.^{53,54} Both positive and negative outcomes were identified at the level of individuals (e.g. improved trainee learning versus trainee learning hindered), relationships (e.g. improved teamwork versus limited time to learn together) and organisation (e.g. improved patient care versus teaching squeezed out by service pressures). The most common positive outcomes identified across the papers were simultaneous improvements in learning *and* patient care, or improved learning or improved patient care (i.e. one without the other). The most common negative outcome identified across the papers was the interventions actually hindering learning. In her earlier review, Scallan noted that without adequate supervision, trainees failed to learn from the patient care in which they were involved, care which itself must be safe and appropriate.¹⁷ At the time of Scallan's study, there had been little research into how short training opportunities might be restructured in order to maximise trainee learning.¹⁷

Common contexts in which the interventions worked were identified across the papers at the individual (e.g. trainee), relationship (e.g. team) and organisational levels (e.g. primary care). The most common contexts underpinning the studies reviewed were primary care contexts, trainee contexts, and doctor, nurse and allied health care professional contexts. Interestingly, our review highlights the interplay between context and different types of WRs. In an era where the patient-centred view of care is considered paramount,^{25,27} it was intriguing to see beliefs that patients should be excluded from WR discussions in order to provide students and trainees with better opportunities for learning and to avoid harming the patient. Although these findings support those of Urquhart *et al.*,⁵⁵ they are contradictory to those within the bedside teaching encounter (BTE) literature^{50,56,57} and recent calls for stakeholders to reconceptualise service as education and vice versa rather than as separate and competing activities.^{2,3,52}

We identified numerous mechanisms contributing to whether interventions worked or not across the reviewed papers, also at the individual (e.g. trainee motivation), interpersonal (e.g. trainee-trainer communication) and organisational levels (e.g. time). By far the most common mechanisms identified across the studies reviewed were at the organisational level, including funding, workload and support. We noted earlier the increase in patient care activity in the absence of a proportionate rise in staffing levels,⁷⁻⁹ and this is reflected both in this current study and Scallan's¹⁷ earlier review. Unfortunately, there is a lack of confidence amongst trainers that an adequate balance of service delivery and health care professional education can realistically be maintained,¹⁰ coupled with a perception by junior doctors (compounded by increased work pressures) that service provision is prioritised over training.¹⁷ Although there is variation in workload across specialties, disciplines and regions,¹⁷ we have observed from our review that lack of time and pressures of workload are issues for health care trainees *and* trainers, and across the primary care spectrum too.

Finally, although we identified 23 distinct CMO configurations across the reviewed papers, we have provided more detail around the top three most frequently mentioned configurations relating to our three most common interventions (CPD, WR and PLT). Taken together, these CMOs support our rough initial programme theory (i.e. that interventions balancing education and service can be effective for workplace stakeholders through mechanisms

at the individual, interpersonal and organisational levels). However, the identified CMOs have helped to further refine our programme theory, helping us to better enunciate both positive and negative outcomes of the interventions, across multiple different contexts, and with a complex interplay of multiple mechanisms at multiple levels. Like other studies,²² although our study has identified a large number of CMO configurations, further research is now needed to further test and refine the programme theory, perhaps using individual or group interviews with key stakeholders, such as the designers and recipients of the different workplace-based interventions [e.g.^{21,48,58}]

Methodological strengths and limitations

Realist synthesis is an approach that is well suited to the evaluation of complex interventions in the health care workplace, and to reviews with substantial heterogeneity among study designs, participants and outcomes.⁵⁴ Furthermore, the additional use of grey literature not only enables triangulation of data from multiple sources, but also demonstrates international relevance [e.g.^{1-3,24,52}]. A multidisciplinary research team lends broad (clinical, educational and managerial) experience and thus more comprehensive data interpretation. The discussion amongst the team of the demi-regularities is important for mapping the complexities of the process and the multiple systems within which it operates onto the $C + M = O$ formula, an activity that is commonly noted as challenging.^{59,60} The authors acknowledge that the strength of evidence provided here is limited in part by the parameters imposed on the scope of the study in its early stages (e.g. UK papers published in 1998 and later). Furthermore, identification of relevant papers in the current study was made challenging because often papers relevant to answering our research questions and our initial programme theory were not specifically focused on balancing health care professional learning with patient care delivery. Therefore, like other published realist syntheses,²¹ our review of potential papers might not have been exhaustive. Although we followed our published realist protocol in most respects,¹⁶ there were two areas in which our study varied from the original protocol, although we do not believe that this affected the quality of the study. Because of the relatively small number of papers under scrutiny, we did not need to use ATLAS.ti to code the papers, as we found it equally effective to code directly into the papers themselves. We identified interventions in the papers but did not identify existing programme theories, because

the majority of papers did not specifically address the balance of learning and service delivery. Much could be learned, however, from broadening the study to include non-UK health care systems such as the USA. Mechanisms identified in other countries may be transferable to a UK context, although such health care systems will be subject to different influencing factors such as funding and education streams, and as such the implications for policy and practice may vary. Further work to test and refine programme theories could also draw on a wider sample of international papers to review [e.g.^{1,3,24}] or from other professions where learners learn on the job, such as engineering.

Implications for education and research

Our study findings in relation to research question 2 have a number of implications for educational policy and practice at the individual, interpersonal and organisational levels. At the individual level, our findings relating to mechanisms suggest that it is important that both learners and educators understand the importance of workplace-based learning and are motivated to make it happen. Learners, for example, need to recognise both their capacity to learn, and the ways in which their learning can lead to positive outcomes not just for themselves but also for their patients and colleagues. Clinical educators and trainers, on the other hand, need to develop their abilities to simultaneously juggle clinical and educational activities within the workplace learning environment. At the interpersonal level, our mechanism-related findings suggest that communication must be improved in order to enhance both team relationships and patient outcomes. Therefore, encouraging opportunities for communication should be prioritised, particularly between learners and trainers. For example, clinical educators can play a role in scaffolding translational work from educational activities that occur outside the workplace (e.g. CPD) into practice. Finally, at the organisational level, our findings relating to mechanisms suggest that it is essential that workplace learning be given sufficient institutional and managerial support with appropriate funding and time. Without adequate time for education, learners may experience suboptimal learning experiences, competence and career progression, plus higher attrition rates. Indeed, lack of supernumerary status for some learners can be extremely stressful.⁶¹

If health care professional learning is inadequately balanced with patient care delivery, negative impacts can and do arise. Patient safety is risked, for

example, if junior doctors are inadequately supervised or educated, plus organisations could potentially lose their workforce supply if learners do not meet their educational requirements or, indeed, decide to leave the workforce.^{62,63} Furthermore, if educational standards are not met, education providers could lose programme approvals, reputation and income.⁶⁴ Given the long-standing tensions between service and education, alongside the ongoing importance of health care professional education set against the current NHS backdrop of increased workload and understaffing, it is essential more than ever to better understand the raft of interventions now in place to balance health care professional education and patient care delivery. We think this service–education tension persists partly from a privileging of formal rather than informal education within the workplace, alongside a privileging of service rather than education by hard-pressed health care professionals, many of whom are not trained as educators. Interestingly, in the 2016 UK GMC report of the National Training Survey, 46.6% of trainers ($n = 11,000$) felt that they would benefit from more training on balancing the needs of service delivery with education.⁶⁵ Further research should therefore capitalise on the strengths of realist approaches in order to evaluate complex health care education interventions more thoroughly, and to better understand what works for whom, under what circumstances and why.

Contributors: SS and CR were responsible for project conception. All authors contributed to protocol development. SS carried out the initial scoping exercise and the database searches. SS, HA and JM sifted for relevance and for rigour. SS, RA and CR established the coding framework and coded the papers. JB selected and incorporated grey literature sources. SS, RA and CR wrote the first manuscript draft, which was then edited by HA, JB, DJ-S and JM. All authors approve the final draft.

Acknowledgements: We would like to thank Andy Jackson, Learning and Teaching Librarian, University of Dundee for his advice and help with our literature searches.

Funding: This project was funded by NHS Education for Scotland via the Scottish Medical Education Research Consortium (SMERC).

Conflicts of interest: no competing interests.

Ethical approval: Ethical approval was not required for this literature review.

REFERENCES

- 1 McMahon GT, Katz JT, Thorndike ME, Levy BD, Loscalzo J. Evaluation of a redesign initiative in an internal-medicine residency. *N Engl J Med* 2010;**362** (14):1304–11.
- 2 Turner TL, Fielder E, Ward MA. Balancing service and education in residency education. A Logical fallacy. *JAMA Pediatr* 2016;**170** (2):101–2.
- 3 Sanfey H, Cofer J, Hiatt JR et al. Service or Education: In the eye of the beholder. *Arch Surg* 2011;**146** (12):1389–96.
- 4 Ham C, McKenna H, Dunn P. *Tackling the Growing Crisis in the NHS*. 2016. <https://www.kingsfund.org.uk/publications/articles/nhs-agenda-for-action>. [Accessed 19 December 2016]
- 5 Audit Scotland. *NHS in Scotland 2016*. http://www.audit-scotland.gov.uk/uploads/docs/report/2016/nr_161027_nhs_overview.pdf. [Accessed 19 December 2016]
- 6 General Medical Council. *The State of Medical Education and Practice in the UK Report: 2016*. http://www.gmc-uk.org/SOME2016_Full_Report_Lo_Res.pdf_68139324.pdf. [Accessed 19 December 2016]
- 7 NHS England. *The Keogh Urgent and Emergency Care Review*. 2014. <http://www.nhs.uk/NHSEngland/keogh-review/Pages/published-reports.aspx>. [Accessed 19 December 2016]
- 8 NHS England. *Monthly Hospital Activity Data*. 2015. www.england.nhs.uk/statistics/statistical-work-areas/hospital-activity/monthly-hospitalactivity/mar-data. [Accessed 19 December 2016]
- 9 Health Education England. *HEE Commissioning and Investment Plan 2016/17*. <https://hee.nhs.uk/sites/default/files/documents/HEE%20commissioning%20and%20investment%20plan.pdf>. [Accessed 19 December 2016]
- 10 General Medical Council. *National Training Survey*. 2015. http://www.gmc-uk.org/NTS_2015_pilot_trainees_survey_report.pdf_61187899.pdf. [Accessed 19 December 2016]
- 11 *NHS Staff Survey 2015*. <http://www.nhsstaffsurveys.com/Page/1006/LatestResults/2015-Results/>. [Accessed 19 December 2016]
- 12 Willis P. *Quality With Compassion: The Future of Nursing Education*. Report of the Willis Commission on Nursing Education. Royal College of Nursing on behalf of the independent Willis Commission on Nursing Education 2012. <http://www.williscommission.org.uk/>. [Accessed 19 December 2016]
- 13 Scottish Government. *Setting the Direction for Nursing and Midwifery Education in Scotland*. 2014. <http://www.gov.scot/Publications/2014/02/4112>. [Accessed 19 December 2016]
- 14 West M, Baker R, Dawson J, Dixon Woods M, Lilford R, Martin G, McKee L, Murtagh M, Wilkie P. *Quality and Safety in the NHS: Evaluating Progress, Problems and Promise*. University of Lancaster. 2012. <http://www.lancaster.ac.uk/media/lancaster-university/content-assets/documents/lums/cphr/quality-safety-nhs-e.pdf>. [Accessed 19 December 2016]
- 15 Dennis AA, Cleland JA, Johnston P, Ker JS, Lough M, Rees CE. Exploring stakeholders' views of medical

- education research priorities: a national survey. *Med Educ* 2014;**48** (11):1078–91.
- 16 Sholl S, Ajjawi R, Allbutt H, Butler J, Jindal-Snape D, Morrison J, Rees C. Balancing student/trainee learning with the delivery of patient care in the healthcare workplace: a protocol for realist synthesis. *BMJ Open* 2016;**6** (4):e011145.
 - 17 Scallan S. Education and the working patterns of junior doctors in the UK: a review of the literature. *Med Educ* 2003;**37** (10):907–12.
 - 18 Greenhalgh T, Wong G, Jagosh J, Greenhalgh J, Manzano A, Westhorp G, Pawson R. Protocol—the RAMESES II study: developing guidance and reporting standards for realist evaluation. *BMJ Open* 2015;**5** (8):e008567.
 - 19 Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review—a new method of systematic review designed for complex policy interventions. *J Health Serv Res Policy* 2005;**10** (Suppl 1):21–34.
 - 20 Wong G, Greenhalgh T, Westhorp G, Buckingham J, Pawson R. RAMESES publication standards: realist syntheses. *BMC Med* 2013;**11** (1):1.
 - 21 Yardley S, Cottrell E, Rees E, Protheroe J. Modelling successful primary care for multimorbidity: a realist synthesis of successes and failures in concurrent learning and healthcare delivery. *BMC Family Pract* 2015;**16** (1):1.
 - 22 Kehoe A, McLachlan J, Metcalf J, Forrest S, Carter M, Illing J. Supporting international medical graduates' transition to their host-country: realist synthesis. *Med Educ* 2016;**50** (10):1015–32.
 - 23 Ellaway RH, O'Gorman L, Strasser R, Marsh DC, Graves L, Fink P, Cervin C. A critical hybrid realist-outcomes systematic review of relationships between medical education programmes and communities: BEME Guide No. 35. *Med Teach* 2016;**38**:229–45.
 - 24 Kesselheim JC, Sun P, Woolf AD, London WB, Boyer D. Balancing education and service in graduate medical education: data from pediatric trainees and program directors. *Acad Med* 2014;**89** (4):652–7.
 - 25 Brennan N, Bryce M, Pearson M *et al.* Understanding how appraisal of doctors produces its effects: a realist review protocol. *BMJ Open* 2014;**4**:e005466.
 - 26 Tilley N. Realistic evaluation: an overview. In: *Founding Conference of the Danish Evaluation Society*, 2000. <http://healthimpactassessment.pbworks.com/f/Realistic+evaluation+an+overview++UoNT+England++2000.pdf>. [Accessed 19 December 2016]
 - 27 Acharya V, Reyahi A, Amis SM, Mansour S. Do, “trainee-centered ward rounds” help overcome barriers to learning and improve the learning satisfaction of junior doctors in the workplace? *Adv Med Educ Pract* 2015;**6**:583.
 - 28 Reece A, Klaber R. Maximising learning on ward rounds. *Arch Dis Child Educ Pract Ed* 2012;**97** (2): 61–7.
 - 29 Stanley P. Structuring ward rounds for learning: can opportunities be created? *Med Educ* 1998;**32** (3): 239–43.
 - 30 Rawnsdon S. A qualitative study exploring student midwives' experiences of carrying a caseload as part of their midwifery education in England. *Midwifery* 2011;**27** (6):786–92.
 - 31 Lucas B, Small N, Greasley P. Protected learning time in general practice: a question of relevance? *Educ Primary Care* 2005;**16** (6):680.
 - 32 Gibbs V. An investigation into the challenges facing the future provision of continuing professional development for allied health professionals in a changing healthcare environment. *Radiography* 2011;**17** (2):152–7.
 - 33 Lloyd-Williams M, Kite S, Hicks F, Todd J, Ward J, Barnett M. Continuing Professional Development (CPD) in palliative medicine: a survey. *Med Teach* 2006;**28** (2):171–4.
 - 34 Haywood H, Pain H, Ryan S, Adams J. Engagement with Continuing Professional Development: Development of a Service Model. *J Allied Health* 2012;**41** (2):83–9.
 - 35 Coventry TH, Maslin-Prothero SE, Smith G. Organizational impact of nurse supply and workload on nurses continuing professional development opportunities: an integrative review. *J Adv Nurs* 2015;**71** (12):2715–27.
 - 36 Ikenwilo D, Skåtun D. Perceived need and barriers to continuing professional development among doctors. *Health Policy* 2014;**117** (2):195–202.
 - 37 Haywood H, Pain H, Ryan S, Adams J. The continuing professional development for nurses and allied health professionals working within musculoskeletal services: a national UK survey. *Musculoskeletal Care* 2013;**11** (2):63–70.
 - 38 Cunningham D, Fitzpatrick B, Kelly D. Administration and clerical staff perceptions and experiences of protected learning time: a focus group study. *Qual Prim Care* 2006;**14** (3):177–84.
 - 39 Cunningham D, Fitzpatrick B, Kelly D. Practice managers' perceptions and experiences of protected learning time: a focus group study. *Qual Prim Care* 2006;**14** (3):169–75.
 - 40 Royal College of Physicians, Royal College of Nursing. *Ward Rounds in Medicine: Principles for Best Practice*. London: RCP 2012.
 - 41 Brooks N, Barr J. Evaluation of protected learning time in a primary care trust. *Qual Prim Care* 2004;**1**:29–35.
 - 42 Cunningham D, Kelly D. The perceptions of educational steering committees on protected learning time in general practice. *Qual Prim Care* 2007;**15** (1):37–43.
 - 43 Claridge A. What is the educational value of ward rounds? A learner and teacher perspective. *Clin Med* 2011;**11** (6):558–62.
 - 44 Cunningham DE, Kelly DR. Community nurses' perceptions and experiences of protected learning time: a focus group study. *Qual Prim Care* 2008;**16** (1):27–37.

- 45 Siriwardena AN, Fairchild P, Gibson S, Sach T, Dewey M. Investigation of the effect of a countywide protected learning time scheme on prescribing rates of ramipril: interrupted time series study. *Fam Pract* 2007;**24** (1):26–33.
- 46 Force J, Thomas I, Buckley F. Reviving post-take surgical ward round teaching. *Clin Teach* 2014;**11** (2):109–15.
- 47 Rushmer R, Kelly D, Lough M, Wilkinson JE, Davies HT. Introducing the Learning Practice–III. Leadership, empowerment, protected time and reflective practice as core contextual conditions. *J Eval Clin Pract* 2004;**10** (3):399–405.
- 48 Williams L, Rycroft-Malone J, Burton CR, Edwards S, Fisher D, Hall B, McCormack B, Nutley SM, Seddon D, Williams R. Improving skills and care standards in the support workforce for older people: a realist synthesis of workforce development interventions. *BMJ Open* 2016;**6**:e011964.
- 49 Meyer E, Lees A, Humphris D, Connell NA. Opportunities and barriers to successful learning transfer: impact of critical care skills training. *J Adv Nurs* 2007;**60** (3):308–16.
- 50 Ajjawi R, Rees C, Monrouxe LV. Learning clinical skills during bedside teaching encounters in general practice. A video-observational study with insights from activity theory. *J Workplace Learn* 2015;**27** (4):298–314.
- 51 Engestrom Y. Expansive learning at work: toward an activity theoretical reconceptualisation. *J Educat Work* 2001;**14** (1):133–56.
- 52 Kesselheim JC, Cassel CK. Service: An essential component of graduate medical education. *N Engl J Med* 2013;**368** (6):500–1.
- 53 Jones AC, Shipman SA, Ogrinic G. Key characteristics of successful quality improvement curricula in physician education: a realist review. *Postgrad Med J* 2015;**91**:102–13.
- 54 Griswold-Theodorson S, Ponnuru S, Dong C, Szyld D, Reed T, McGaghie WC. Beyond the simulation laboratory: A realist synthesis review of clinical outcomes of simulation-based mastery learning. *Acad Med* 2015;**90** (11):1553–60.
- 55 Urquhart LM. Exploring the feedback process with medical students and their educators: Listening, watching, understanding. 2015, Unpublished PhD thesis, University of Dundee, UK.
- 56 Monrouxe LV, Rees CE, Bradley P. The construction of patients' involvement in hospital bedside teaching encounters. *Qual Health Res* 2009;**19** (7):918–30.
- 57 Coulter A, Magee H. *The European Patient of the Future*. Maidenhead: McGraw-Hill Education (UK) 2003.
- 58 Rycroft-Malone J, McCormack B, Hutchinson AM et al. Realist synthesis: illustrating the method for implementation research. *Implement Sci* 2012;**7**:33.
- 59 Dalkin SM, Greenhalgh J, Jones D, Cunningham B, Lhussier M. What's in a mechanism? Development of a key concept in realist evaluation. *Implement Sci* 2015;**10** (1):1.
- 60 Jagosh J, Pluye P, Wong G, Cargo M, Salsberg J, Bush PL, Herbert CP, Green LW, Greenhalgh T, Macaulay AC. Critical reflections on realist review: insights from customizing the methodology to the needs of participatory research assessment. *Res Synth Meth* 2014;**5** (2):131–41.
- 61 Last L, Fulbrook P. Why do student nurses leave? Suggestions from a Delphi study. *Nurse Educ Today* 2003;**23** (6):449–58.
- 62 Campbell D. North Middlesex A&E staff describe unit as unsafe and unsupported. The Guardian, 19th June 2016.
- 63 North Middlesex University Hospital Trust: Joint Statement From the GMC and HEE. http://www.gmc-uk.org/GMC_HEE_DOCUMENT_NMUH_July_2016_Final.pdf_66825868.pdf. [Accessed 19 December 2016]
- 64 Stephenson J. Quality and quantity of student placements at risk from staff shortages. Nursing Times, 12th February 2014. <https://www.nursingtimes.net/roles/nurseeducators/investigation-ward-pre-ssures-hit-student-placements/5067842.article>. [Accessed 19 December 2016]
- 65 General Medical Council. *National Training Survey*. 2015. http://www.gmc-uk.org/National_training_survey_2016_key_findings_68462938.pdf. [Accessed 19 December 2016]
- 66 Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 2009;**6** (7):e1000097.
- 67 Nursing and Midwifery Council. *14/NMC Circular: Review of pre-Registration Midwifery Education – Decisions Made by the Midwifery Committee*. London: NMC 2007.
- 68 CPD Certification Service. 2016. <https://cpduk.co.uk/explained>. [Accessed 19 December 2016]
- 69 Jagosh J, Macaulay AC, Pluye P et al. Uncovering the benefits of participatory research: implications of a realist review for health research and practice. *Milbank Q* 2012;**90** (2):311–46.
- 70 British Medical Association. *What is the European Working Time Directive?* 2012. <https://www.bma.org.uk/advice/employment/working-hours/ewtd>. [Accessed 19 December 2016]
- 71 *Fourth International Conference on Grey Literature*. 1999. <http://www.greylit.org/about>. [Accessed 19 December 2016]
- 72 Segen J. *Segen's Medical Dictionary*. Huntingdon Valley, PA: Farlex, Inc 2012.
- 73 Haghani F, Arabshahi SKS, Bigdeli S, Alavi M, Omid A. Medical academia clinical experiences of Ward Round Teaching curriculum. *Adv Biomed Res* 2013;**3**:50.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Table S1 Summary of literature types and sources.

Table S2 MeSH terms and key phrases searched.

Table S3 Inclusion and exclusion criteria.

Table S4 Summary of the contexts, mechanisms and outcomes identified for all interventions across the study sample.

Box S1 23 identified configurations. [I] = intervention, [C] = context, [M] = mechanism, [O] = outcome.

Figure S1 Visual representation of refined programme theory for CPD.

Figure S2 Visual representation of refined programme theory for WRs.

Figure S3 Visual representation of refined programme theory for PLT.

Received 23 September 2016; editorial comments to author 11 November 2016, accepted for publication 19 January 2017