



REVIEW ARTICLE

Peer learning and collaborative placement models in health care: a systematic review and qualitative synthesis of the literature

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ABSTRACT

Aims: To summarise the international empirical literature to provide a comprehensive overview of peer learning and collaborative practice placement models in health care and to synthesise their benefits and challenges.

Background: Practical placements for students are in high demand due to the need for an increased nursing, midwifery and health professional workforce, thus collaborative placement models are an attractive solution to potentially increase placement capacity and enhance the student learning experience.

Design: A systematic search of the literature and qualitative data synthesis using the PRISMA checklist and ENTREQ guidelines.

Review methods: MEDLINE and CINAHL searched in March 2020. Quality appraisal of studies conducted. Collaborative models and empirical findings summarised. Reported benefits, challenges and implementation recommendations synthesised. Two tables developed for data representation.

Results: 172 studies were identified by the search strategy. Of these, 47 articles were included for appraisal and synthesis. 30 articles employed qualitative, seven quantitative and ten mixed-methods approaches. Research took place in eight countries. The majority of studies employed focus groups, interviews as well as questionnaire design. The total participant sample was 3462 consisting of students and educators.

Conclusions: This review confirmed that any peer learning is beneficial in supporting students' confidence and team working skills. It is especially helpful when pairing first year with third-year students. The latter can demonstrate their clinical skills and prepare for working in practice. Simultaneously, expert-led learning is important for role modelling and for the recognition of acquired skills. Evidence on the optimal placement experience is inconclusive; however, it can be concluded that any form of collaborative placement model requires careful planning and continuous preparation for staff and students.

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Relevance to clinical practice: Decision makers should consider implementing at least some form of peer learning to assist students with peer support, and ideally work towards a collaborative learning environment.

KEYWORDS

2:1 models, collaborative learning, collaborative practice placement models, health care work placements, peer learning, peer-assisted learning, practice learning models, practice placements, student experiences

1 | INTRODUCTION

There is a world-wide shortage of health professionals (Haddad & Toney-Butler, 2020; Markowski et al., 2020) and nurses and midwives comprise at least 50% of this shortage (WHO, 2020). Practical placements in hospitals, clinical environments and in the community are key components in the education of future health professionals to prepare them for the realities of work after becoming qualified. At the same time, the number of practice placements that can be offered to students in a number of countries is frequently a bottleneck in increasing student numbers (Beech et al., 2019). Collaborative placement models, where more than one student can be assigned to one registered practitioner and peer learning takes place, play a pivotal role in upscaling the education opportunities for the future workforce. However, whilst it is important to increase student numbers there is a need to understand the advantages and disadvantages that come with educating more than one student at the time. To date, evidence on this has been mixed. This article will present the findings of a systematic review of the literature to provide an overview of peer learning interventions and collaborative models in practice placements. This is followed by a textual narrative synthesis (Lucas et al., 2007) of the strength and weaknesses of the models and recommendations for their implementation based on the evidence reviewed. This article contributes to evidence to support decision makers within health education providers to make informed decisions on how to implement a future education model in their specific context.

2 | BACKGROUND

The philosophical roots of peer learning can be found in theories of social learning and constructivism and from thinkers such as Vygotsky, Bandura, Piaget and Dewey and it assumes that learning is constructed during social interaction in collaboration with significant others (Hellstroem-Hyson et al., 2012; Mamhidir et al., 2014; Stenberg & Carlson, 2015; Topping & Ehly, 2001).

Peer learning is at the heart in the understanding of collaborative placement models, which are models where two or more students participate in supervised work placements. Peer learning is not a new concept and it has been well documented in the education, psychological and medical education literature (Boud & Garrick, 2012; DeClute & Ladyshevsky, 1993; Topping, 2005). A number of literature reviews

What does this paper contribute to the wider global clinical community?

- This article provides a comprehensive overview of peer learning and collaborative practice placement models in health care.
- The evidence of the models has been synthesised and discussed with the aim to assist decision makers in considering the implementation of the most appropriate supervision models for their context.
- The article confirms previous findings that peer learning and collaborative supervision models are beneficial for students in respect to building confidence and providing support, but adequate preparation of clinical educators and students is key.

concerned with peer learning or peer mentoring in clinical placements (Carey et al., 2018; Secomb, 2008; Tai et al., 2016) and the search for evidence for a superior education model (Briffa & Porter, 2013; Forber et al., 2016; Jokelainen et al., 2011; Lekkas et al., 2007; Millington et al., 2019; Williamson, Plowright, et al., 2020) have already been published. As a whole, these reviews provide evidence for peer learning as a beneficial part of the learning experience, but also point to the lack of evidence for conclusive outcomes on a superior model or gold standard. Furthermore, literature is inconsistent around the use of terminology for peer learning and there is no agreed taxonomy related to peer and collaborative learning (Forber et al., 2016). This article will employ the term 'peer learning' as an umbrella term to describe any form of learning such as informal or moderated or structured learning including peer-assisted learning (PAL), which is taking place between people of a similar group (i.e. students).

The benefits of peer learning have been well established and comprise peer support and feedback to help in developing competence and confidence as well as reducing stress and anxiety, peers can be role models for enhancing clinical knowledge and challenges of clinical practice are mitigated by peer support (Carey et al., 2018; Price & Whiteside, 2016; Tai et al., 2016). Challenges with peer learning occur when students have very different learning styles, very different knowledge levels and perceive the fellow peer as competition or as intimidating (McPake, 2019; Secomb, 2008) and this consequently

implies more time is required by the educator to deal with those issues (Nygren & Carlson, 2017; Price & Whiteside, 2016; Stenberg et al., 2020). The collaborative learning models, which inherently build on peer learning, such as 2:1 models (2 students and 1 educator), Dedicated Educations Units (DEU), Student Wards and Collaborative Learning in Practice (CLIP) also provide all the above-mentioned benefits including the benefits of an enhanced learning environment (Briffa & Porter, 2013; Currens & Bithell, 2003; McPake, 2019; Stenberg et al., 2020; Stenberg & Carlson, 2015). The disadvantages for the collaborative models are mainly centred around the increased administrative workload in regards to placement allocation, documentation and student evaluation (Alpine et al., 2019; Briffa & Porter, 2013; Currens & Bithell, 2003; Dawes & Lambert, 2010; Lynam et al., 2015; McPake, 2019; Nygren & Carlson, 2017; O'Connor et al., 2012; Price & Whiteside, 2016; Reidlinger et al., 2017); less time available for the clinical educators to provide individual supervision and feedback (Alpine et al., 2019; Briffa & Porter, 2013; Currens & Bithell, 2003; Dawes & Lambert, 2010; Martin et al., 2004; Price & Whiteside, 2016; Reidlinger et al., 2017; Rodger et al., 2009); the need for sufficient patient or client numbers and a range of conditions to offer learning opportunities (Dawes & Lambert, 2010; Jelley et al., 2010; Martin et al., 2004; McPake, 2019; O'Connor et al., 2012; Price & Whiteside, 2016; Rodger et al., 2009) and the challenges around negative competition between students (Alpine et al., 2019; Currens & Bithell, 2003; McPake, 2019; Nygren & Carlson, 2017; O'Connor et al., 2018; Price & Whiteside, 2016; Secomb, 2008; Sevenhuysen et al., 2015; Stenberg et al., 2020; Stenberg & Carlson, 2015).

Despite these established benefits and challenges, we lack an effective overview on how the models compare in set-up structure (e.g. supervisory style, additional roles), their effectiveness for students and educators and the level of evidence that supports this.

3 | METHOD

3.1 | Aims

The aim of this systematic search and textual narrative synthesis is to summarise the empirical literature related to peer learning and collaborative learning models in clinical or community practice placements for healthcare students. This review was guided by the two following research questions:

Which peer learning and collaborative practice placement models for healthcare students have been studied and reported on in the academic literature? And what are their relative strengths and weaknesses?

3.2 | Design

This review is based on the integrative review methodology (Whittemore & Knaf, 2005) as it allows for the inclusion of a range of studies (qualitative, quantitative and mixed-methods). This review

follows the steps of problem identification, literature search, data evaluation, data analysis and presentation (Whittemore & Knaf, 2005). A PRISMA diagram has been developed to summarise the search process and selection process (Moher, 2009) and the PRISMA checklist utilised (see supplementary File 1). A qualitative evidence synthesis was carried out to produce the description of groups of models (Table 3) alongside development of an overview (Table 4) to visualise the type and level of evidence gathered. The ENTREQ reporting guidelines (Tong et al., 2012) have been followed (see supplementary File 2). A textual narrative synthesis highlights the noteworthy strength and weaknesses of the models, their set-ups or inconsistency to other findings. The search has been limited to articles from 2010 onwards since key changes in the nursing and midwifery education in the UK had been implemented based on the 'Standards to support learning and assessment in practice' (SLAiP; NMC, 2008). These standards included the requirement to work with a 'sign off mentor' for 40% of the practice time (NMC, 2008 p.39 ff), which effectively implied a model of 1:1 mentoring and restricting the implementation of any potential collaborative model. (With the introduction of the new NMC standards in the UK, which came into effect on 28 January 2019, a greenlight for supervision models based on coaching was given (NMC, 2018).

3.3 | Search methods

The SPIDER method to develop search terms (Cooke et al., 2012) was used to reflect the sample, phenomenon of interest, design, evaluation and research type. The final search terms are included in Table 1. A single systematic search (to cover all research types) of the literature was undertaken using CINAHL and Medline on 9 March 2020. CINAHL and Medline are the key databases employed in nursing research. In addition, the resulting articles were hand searched for specific references, which may have been missed. These were followed up by searching the specific journal or by using Google scholar and further cross-checked to identify if any key studies were missed by using the 'related journal article' function.

TABLE 1 Search terms

'Collaborative Learning in Practice'	AND	clinical placement
OR		OR
'Collaborative learning'		practice placement
OR		OR
'peer learning' or 'peer-learning'		clinical experience
OR		OR
'collaborative coaching'		student placement
OR		
'Placement learning'		
OR		
'peer assisted learning' or 'peer-assisted learning'		
OR		
'peer to peer learning' or 'peer-to-peer learning'		

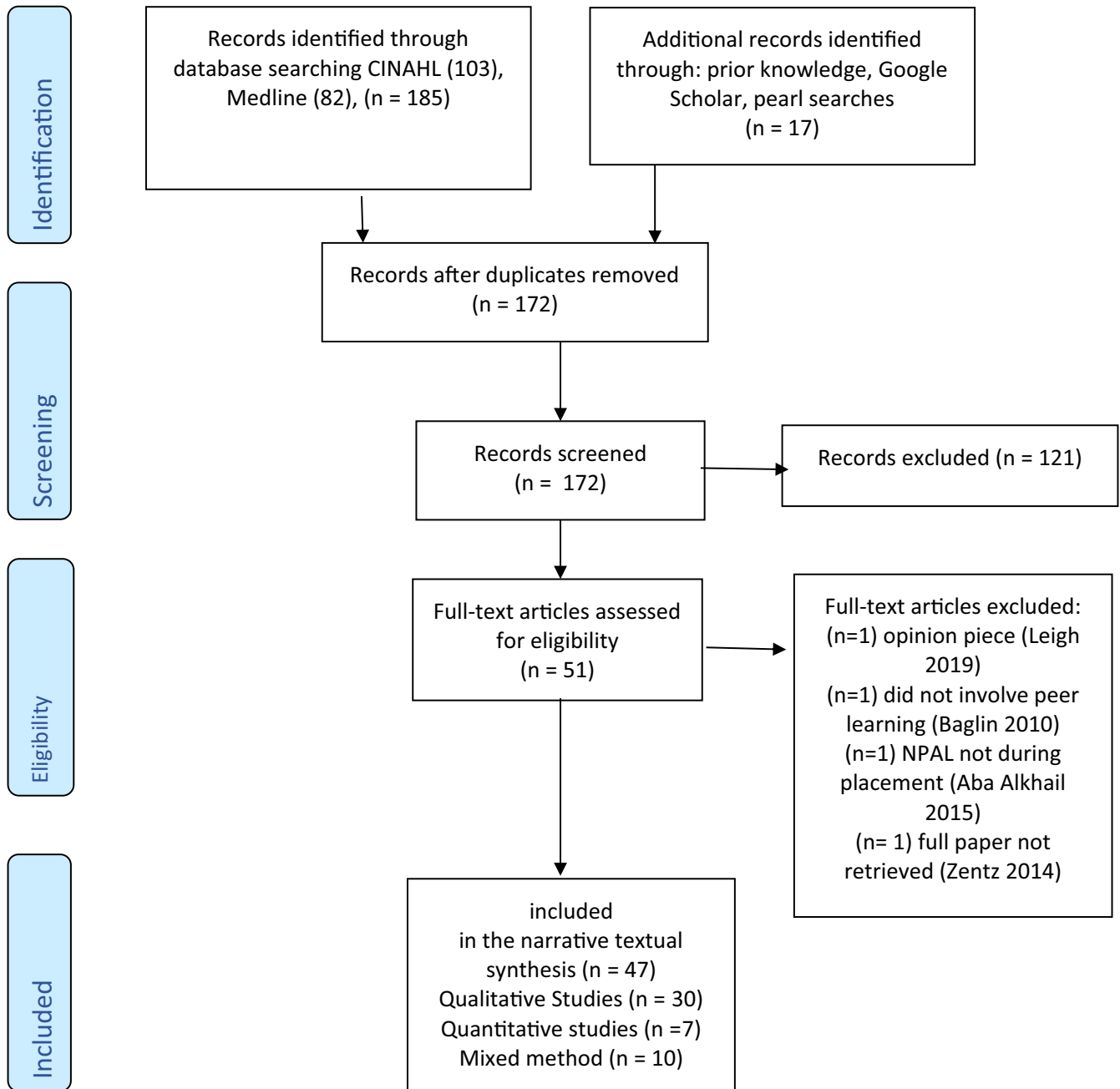


FIGURE 1 PRISMA flow diagram

3.4 | Search results.

The search returned 185 articles, which were reduced to 172 after the removal of duplicates (See Figure 1). At the screening stage, titles and abstracts were assessed against the following inclusion criteria:

- Empirical/primary peer-reviewed research articles.
- Quantitative-, qualitative- and mixed-methods studies.
- The research included preceptors or students from subjects in health care and of one discipline or very similar disciplines only.

- Explicitly referred to forms of peer learning or collaboration during the period of the practice placement.

Exclusion criteria were as follows:

- Insufficient details on the practice placement model involving peer learning provided.
- Any form of interprofessional peer learning.
- Literature reviews of any kind.
- Books.
- Conference papers.

Following screening, a further 121 articles were removed, leaving 51 articles to be included. However, upon retrieval of the full-text articles, it became clear that Leigh et al. (2019) was an article published in the commentary section of the journal and the Near Peer Assisted Learning (NPAL) model by Aba Alkhail (2015) did not take place during clinical placement nor did Baglin and Rugg (2010) include any peer learning in their placement model. The article by Zentz et al. (2014) was not retrievable in full text by the authors, leaving 47 articles to be included in the critical appraisal.

3.5 | Quality appraisal

Two researchers (RE, MM) independently assessed 47 full-text articles using the Mixed Methods Appraisal Tool (MMAT), version 2018 (Hong et al., 2018). Articles were segregated according to whether they were of quantitative (descriptive; non-randomised; randomised), qualitative or mixed-methods design and assessed using the criteria for their category within the tool.

3.6 | Data extraction

Data from the included studies were extracted by two authors (HB, MM) and categorised according to the country where the research took place, study aims and objectives, research methods, sample size and main findings. The extraction table (Table 2) provides a summary of all included research studies.

3.7 | Synthesis

The authors carried out a textual narrative synthesis (Lucas et al., 2007) by firstly categorising the models presented in the results articles into groups, by secondly reviewing the research approach and the quality of evidence provided and finally by collecting the described strength and weaknesses of each model whilst paying attention to notable difference in their results. Due to heterogeneity across studies, a meta-analysis of quantitative data for further analysis was not possible. Instead, the main author concentrated on the qualitative aspects of the mixed method and quantitative research designs and 'qualitised' quantitative data, that is transformed quantitative data into qualitative data (Loehnert, 2010; Tashakori & Teddlie, 1998), for the purposes of data synthesis.

4 | RESULTS

4.1 | Quality appraisal results

Overall, the results of the studies combined were average to good with appropriate methods being used to answer the questions being raised (Figure 2). The qualitative and non-randomised quantitative

studies had a higher overall quality when compared to mixed methods and randomised quantitative studies. Individually, the mixed-methods studies had issues related to each of the MMAT domains, while the randomised quantitative studies generally failed to completely report group characteristics at baseline, blinding and complete outcomes data. In saying this, there were only two studies in this category (Mulready-Shick et al., 2013; Sevenhuysen et al., 2014). The non-randomised quantitative studies most notably failed to identify or discuss potential confounders, while the issues with the qualitative studies were equally spread across each MMAT domain. Several qualitative and mixed-methods studies met all criteria, while three qualitative (Hannon et al., 2012; Harvey & Uren, 2019; Tweedie et al., 2019) and two mixed-methods studies (Barnett et al., 2010; O'Lynn, 2013) did not meet any of the MMAT criteria (Hong et al., 2018).

4.2 | Results of textual narrative synthesis

The authors developed an overview table of models, into which the results were sorted into three groups under which some subgroups were articulated (see Table 3).

The first column 'peer learning interventions' describes research that observed or evaluated peer learning taking place either informally or formally in otherwise traditionally supervised placement models, which is typically 1:1 supervision. The first subgroup in the column refers to research, which observed informal peer learning as well as formal peer learning taking place between students (Tai et al., 2017; Tai, Molloy, et al., 2016). The second subgroup comprises specific peer learning interventions such as peer-assisted learning (PAL; Carey et al., 2018), *Learning circles* (Grealish et al., 2019), unmonitored student learning in groups (Bennett et al., 2015) and *Peer learning partnership*, where students from different year groups were partnered (Christiansen & Bell, 2010). The third subgroup are peer teaching interventions, where either a peer from the same year group teaches peers (Ravanipour et al., 2015) or senior students teach junior students (Alfaro et al., 2019).

The second column '2:1 models' lists placement models where two students are being supervised by one educator with varying degrees of formalised peer learning activities. The first part of the column presents research that took place on 2:1 models in 'Allied Health', starting with an early study spanning over three areas of Allied Health (Dawes & Lambert, 2010) to research in Physio and Occupational therapy (Alpine et al., 2019; Jelley et al., 2010; O'Connor et al., 2012; Price & Whiteside, 2016; Sevenhuysen et al., 2014, 2015), Dietetics (Lynam et al., 2015; Reidlinger et al., 2017) and Radiotherapy (McPake, 2019). The second part of the column presents 'Nursing' and refers to research around *structured learning activities* employed with pairs of students during their placement (Nygren & Carlson, 2017; Stenberg et al., 2020; Stenberg & Carlson, 2015).

The third column 'collaborative learning models' lists models for groups of more than two students being supported by more than one educator during the placement. All studies were conducted in the field of nursing. The first subgroup presents the Dedicated Education Unit

TABLE 2 Summary of included research articles

Reference	Country	Study aim(s)	Research methods
Alfaro et al. (2019)	Canada	To explore experiences of nursing students in their first medical-surgical practicum following their participation in a Near Peer Learning Activity (NPLA) in a clinical setting	Qualitative descriptive design using semi-structure interviews and field notes
Alpine et al. (2019)	Ireland	To investigate student and practice educator evaluations of practice placements using a structured 2 to 1 supervision and implementation model	Mixed method: Cross-sectional pilot study using a self-reported questionnaire
Barnett et al. (2010)	Australia	To develop and evaluate a collaborative model of clinical education to increase student placements and improve workplace readiness	Participatory action approach—mixed method
Bennett et al. (2015)	Ireland	To understand how PAL transfers to the clinical environment	Qualitative—using activity theory and activity systems analysis (ASA)
Carey et al. (2018)	UK	To explore peer-assisted learning in undergraduate nursing students, studying children's health, in the clinical practice setting	Qualitative ethnographic study using non-participant observation
Christiansen & Bell (2010)	UK	To explore the impact of a peer learning initiative developed to facilitate supportive learning relationships	Interpretive qualitative design—focus groups
Crawford et al. (2018)	NZ	Evaluation of the impact of the Dedicated Education Unit on nursing staff and students	Mixed method—descriptive evaluation design
Dawes and Lambert (2010)	UK	To explore Allied Health Professional (AHP) practice educators' experiences of using the 2:1 model	Qualitative—interviews and focus group
Ekstedt et al. (2019)	Sweden	To compare nursing students' perceptions of the clinical learning environment and supervision in two different supervision models	Quantitative—questionnaire using CLES+T scale and one bespoke instrument
Galuska (2015)	US	To explore the effects of a DEU experience on the leadership development of baccalaureate nursing students	Mixed-methods design: a quasi-experimental design utilising the Student Leadership Practice Inventory and focus groups
George et al. (2017)	US	To compare student outcomes from the traditional clinical education (TCE) model with those from the DEU model	Quantitative, quasi-experimental using the Generalized Self-Efficacy Scale
Grealish et al. (2019)	Australia	To evaluate the contributions to student learning from structured peer discussions about patient care.	Qualitative: exploratory observational study including the review of student-generated concept maps
Hannon et al. (2012)	US	To evaluate the DEU pilot	Qualitative: student feedback, comments, student journals and focus groups
Harvey and Uren (2019)	UK	To conduct a pilot study to implement Collaborative Learning in Practice (CLIP)	Informal qualitative feedback and diary entries
Hellstroem-Hyson et al. (2012)	Sweden	To describe nursing students' experiences of two supervision models: student wards and traditional supervision	Qualitative approach - Interviews

Sample size / Participants	Results
(N = 10) nursing students	An early clinical learning activity by a supportive near peer shows potential in mitigating some of the worries experienced by novice students transitioning into their first clinical rotation and enhances their ability to apply their HPA skills.
(N = 10) of 20 physio therapy students responded to questionnaire (10/20; RR:50%). (N = 10) of 10 practice educators responded (RR: 100%)	There was generally positive agreement that placements using the 2 to 1 model were positively evaluated by participants. There were no significant differences between students and practice educators.
Feedback obtained from a survey (N = 79), focus group discussions (9 groups) and interviews (N = 5) with preceptors, nursing students, education and management staff	The collaborative model of clinical education supported an increase in the capacity of a hospital to accept students for placement. Workplace readiness was likely to be improved.
Qualitative feedback on forms and 3 focus groups with medical students (n = 8–10 in each) from a pool of 150 students taking part in PAL across 4 hospital sites	Learning from experts and learning from peers are two competing activity systems which needs to be considered when planning learning opportunities.
Two teaching hospitals: (N = 17) nursing students observed for 67 h raw data collection	PAL stimulates students in becoming engaged in their learning experiences. However, the benefits of PAL in current clinical practice settings can be challenging.
(N = 54) nursing students who took part in peer learning partnerships	Peer learning partnerships have brought both affective and cognitive gains in terms of increased self-esteem, the development of nurturing relationships essential to successful mentorship and a heightened sense of readiness for registration and future professional practice.
Survey (N = 42) nurses and nurse managers (out of a potential 160 staff: RR:26%), (N = 24) undergraduate third-year nursing students (out of 26 students 92%); six focus groups for second phase	Over 70% of nurses were very or satisfied participating in the DEU and 62.5% of students were very or satisfied in taking part.
13 practice educators in Allied Health	The practice educators reported mixed views regarding the 2:1 model. Emergent themes suggested success of supervising two students may have a greater relationship with the attitude and philosophy of the practice educator than with the profession or clinical setting.
Out of 381 eligible nursing students (N = 244) filled out questionnaires, (RR:64%). Of these, 170 students (90% women) were supervision in model A and 74 students (88% women) in model B	Both models elicited overall satisfaction. Students supervised in pairs had more positive experiences of the cooperation and relationship between student, preceptor, and nurse teacher, and felt that the ward had an explicit model for supervising.
(N = 32) senior nursing students (17 DEU students and 15 control) + focus groups: CI groups of five to seven participants	Students in the DEUs demonstrated significant increases in leadership behaviours. Findings suggest that the DEU experience may promote enhanced undergraduate leadership competency development.
(N = 193) fourth year nursing students	The increase in self-efficacy for the DEU students was significantly greater than the increase in self-efficacy for the traditional students.
(N = 72) Nursing students in Years 2 and 3	While clinical placement is valued for developing empirical and aesthetic forms of knowing, the other forms of knowing (ethical, socio-political, person) have value for patient and family care and warrant strategies to improve their further development.
Nursing students, Clinical instructors (Cis), nurse manager, faculty members =participants numbers are unclear	The evaluation was overwhelmingly positive and a “win-win” for patients, students, staff, and faculty.
some nursing students, some staff	Collaborative learning as a mentorship model promotes effective team working and helps students develop their leadership and organisational skills. Effective support networks for mentors and students are crucial to the success of this model, as is the leadership from the ward sister.
Interviews with (N = 8) 3rd year nursing students	Supervision on a student ward was found to give nursing students a feeling of acknowledgment and more opportunities to develop independence, continuity, cooperation and confidence.

(Continues)

TABLE 2 (Continued)

Reference	Country	Study aim(s)	Research methods
Hill et al. (2020)	UK	To examine the perceptions of gains and losses of students and stakeholders when experiencing CLIP	Mixed method: (1) a survey of students taking part in CLIP and traditional supervision; (2) student focus groups; (3) qualitative one-to-one interviews with key stakeholders
Holst and Hörberg (2012)	Sweden	To describe the learning process of students, in an encounter with a patient, when supported by supervision given to a pair of students	Qualitative based on phenomenological meaning analysis
Holst and Hörberg (2013)	Sweden	To describe the process of students' learning towards their profession, when supported by supervision in pairs	Qualitative based on phenomenological meaning analysis
Holst et al. (2017)	Sweden	To describe how supervisors support nursing students' learning in pairs during their clinical practice	Qualitative approach—interviews and focus groups
Jelley et al. (2010)	Canada	To examine the perceived impact of a Physiotherapy (PT) and PTA student shared clinical placement using reciprocal peer coaching	Qualitative: pre- and post-placement interviews and journals
Lynam et al. (2015)	Ireland	To evaluate a pilot study of a collaborative peer learning 2 students to 1 educator (2:1 model)	Qualitative
Mamhidir et al. (2014)	Sweden	To describe nursing preceptors' experiences of two clinical education models: peer learning and traditional supervision	A descriptive design and qualitative approach
Masters (2016)	US	To improve nursing students' knowledge of quality and safety by integrating Quality and Safety Education for Nurses into clinical nursing education through development of a dedicated education unit	Mixed method—descriptive survey and focus groups
McPake (2019)	UK	To explore the experiences of two radiotherapy placement models	A three-phased, mixed-methods study. Phase 1: quantitative for baseline information from HEIs, Phase 2: bespoke questionnaires, Phase 3: qualitative = focus groups and interviews
Mulready-Shick et al. (2013)	US	To evaluate in what ways, if any, the DEU intervention enhances clinical educational quality compared with the traditional education model	A randomised, controlled, multiyear, multisite study using the Student Evaluation of Clinical Education Environment (SECEE) instrument, the Growth in Clinical Learning Scale, and the Quality and Safety Competency Development Scale
Mulready-Shick & Flanagan (2014)	US	To evaluate the sustainability of dedicated education units (DEUs) within an academic-service partnership	Qualitative: interviews

Sample size / Participants	Results
(N = 607) questionnaire responses (out of a pool of 738 nursing students) five focus groups with (N = 30) students (N = 13) stakeholder interviews	Students who had experienced CLIP reported lower supervisory relationship scores compared with those in traditional supervision ($p = 0.001$). CLIP offers many benefits as an approach to clinical learning, but attention needs to be paid to aspects such as sufficient numbers of students, and an acknowledgement of perceived losses as well as gains.
6 interviews with pairs of nursing students (N = 12) + diary entries	Results show that security and insecurity in the pairs of students, environmental conditions and attitude of health care professionals have influence on the students' learning process.
(N = 12) nursing students	The essential meanings of the lived experiences of the learning process are characterised by the space for learning, which consists of time and place and interactions with patients, supervisors and fellow students. The phenomenon is further characterised by a balanced responsibility, openness, flexibility in response between student and supervisor and a structured learning environment.
(N = 25) nursing supervisors	The support is characterised by being available for the students with a supervisory approach that is guided by reflection. Students gradually gain the opportunity to become more independent and the supervisor strives to become less prominent.
(N = 3) third-year PT students and (N = 3) second-year PTA students	Reciprocal peer coaching increased students' self-directed learning. Participants reported an improvement in competencies in communication, consultation, and assignment of tasks within the physiotherapy team and an increase in confidence towards their respective roles and teamwork.
Dietetics educators / advisory board members (number is unclear)	This pilot study of a 2:1 model in dietetics practice placement education informed the design and development of a framework for implementation of the model. More practical information on the implementation the 2:1 model is required, particularly the facilitation of the peer feedback process.
(N = 18) interviews with nursing preceptors from two hospitals	Preceptors using peer learning created room for students to assume responsibility for their own learning, challenged students' knowledge by refraining from stepping in and encouraged critical thinking. Using traditional supervision, the preceptors' individual ambitions influenced the preceptorship and their own knowledge was empathised as being important to impart.
(N = 15) for DEU nursing students, (N = 14) for non-DEU students, focus group with (N = 7) clinical instructors	Students who participated in the DEU had higher scores for answers related to those with quality and safety than those with traditional clinical rotations.
student questionnaires: (N = 136) of 231 radio therapy students (RR = 59%) Practice educators: (N = 184) of 455 educators, (RR = 40%) (N = 13) student focus group (N = 15) educator focus group	Study findings suggest that neither radiotherapy model is superior to the other in terms of placement education and experience. It is recommended that all students should have access to peer-assisted learning on placement to improve critical thinking skills, to enable time for reflection, and to consolidate learning.
(N = 165) nursing students of 255 (RR 65%) completed the survey (N = 111) DEU groups, (N = 54) traditional groups	Students in DEUs reported significantly more positive learning experiences on all measures. In the follow-up data with the same students in their 3rd year of nursing studies, both models resulted in similar learning outcomes.
(N = 34) consisting of 12 DEU CIs, 12 staff nurses, 3 clinical faculty coordinators, and 7 DEU partners	Sustainable, mature clinical education partnerships depend on implementing routinising, reinforcing, recognising, and rewarding activities. DEU sustainability will depend on the continual creation of new meaning for participants and the generation of new resources and results.

(Continues)

TABLE 2 (Continued)

Reference	Country	Study aim(s)	Research methods
Nygren and Carlson (2017)	Sweden	To describe the variation of registered nurses' conceptions of preceptorship in a peer learning model for undergraduate nursing students	Qualitative descriptive design
O'Connor et al. (2012)	Ireland	To explore perspectives of clinical educators and students who had participated in two different placement models (2:1 / 1:1)	Qualitative descriptive design using interviews
O'Lynn (2013)	US	Evaluation of an DEU long-term care pilot comparing it to a hospital DEU	Mixed method: survey and 3 focus groups (1 x staff, 2 x students) and interviews
Palsson et al. (2017)	Sweden	To investigate the effects of peer learning in clinical practice education on nursing students' self-rated performance compared with traditional practice education.	Quasi-experimental design using a questionnaire that covered: critical thinking collaborative behaviour, learning and development, satisfaction with provided care
Price and Whiteside (2016)	Australia	To understand the challenges and opportunities new models of supervision present and how any difficulties might be overcome	A social constructivist theoretical perspective and an exploratory qualitative design
Ravanipour et al. (2015)	Iran	To explore the nursing students' experiences of peer learning	Qualitative research design - focus groups
Reidlinger et al. (2017)	UK	To evaluate a PAL and small-group teaching model of dietetic practice placement education implemented in the UK	Mixed method: weekly questionnaires and end of placement focus groups
Rhodes et al. (2012)	US	Aims of this study were to (a) investigate students' perceived outcomes of the DEU model on the Clinical learning environment (CLE) and (b) explore staff nurses' and faculty's perceived outcomes of the DEU	Mixed method using student surveys, DEU nurse surveys, focus groups
Schechter et al. (2017)	US	To explore the effect three consecutive adult health DEU clinical placements on baccalaureate nursing students' self-perception of growth in competence and confidence	Quantitative: a Likert-type Competence / Confidence Self-Assessment Scale was constructed
Sevenhuysen et al. (2014)	Australia	To ascertain the efficacy and acceptability of a peer-assisted learning model compared with a traditional model for paired students in physiotherapy clinical education	Assessor-blinded, randomised crossover trial
Sevenhuysen et al. (2015)	Australia	To compare the experiences of students and clinical educators in a paired student placement model facilitating PAL activities with a traditional paired teaching approach.	Qualitative study utilising focus groups
Smyer et al. (2015)	US	To evaluate the significant differences in academic outcomes on critical thinking, on the nursing process, the quality and safety measures between students in DEU or in the traditional clinic.	Quantitative: longitudinal quasi-experimental repeated measures design utilising the Health Education System, Inc (HESI) standardised testing for critical thinking, the nursing process, quality and safety education
Sternberg and Carlson (2015)	Sweden	To explore how student nurses' evaluated peer learning as an educational model during clinical practice in a hospital setting.	Mixed method: questionnaire with open and closed questions

Sample size / Participants	Results
(N = 12) interviews with nursing preceptors	The result of this study showed that preceptors conceived peer learning as enabling them to take a step back, which gave them a new role and perspectives.
(N = 12) physio and Occupational therapy students and (N = 8) clinical educators	Each clinical placement model requires specific organisational and planning skills to be effective. An awareness of individual student learning is essential to avoid dissatisfaction with the learning and assessment process on a 2:1 model.
(N = 237) hospital DEU nursing students and (N = 76) DEU-LTC students	Health students placed on the DEU-LTC performed equally to classmates placed on DEUs based in acute care hospitals on simulations, examinations, and course grades. Long-term care staff found the adapted DEU model preferable to traditional clinical education models, and management observed increased staff professionalism following the launch of the DEU-LTC.
(N = 70) nursing students (out of possible 87) answered the questionnaires at both baseline and follow-up. 42 of 46 students were in the intervention group and 28 of 39 in the comparison group	Self-efficacy was improved in the intervention group and a significant interaction effect was found for changes over time between the two groups.
Two focus groups with (N = 8) Occupational therapy supervisors	The 2:1 placement model presented challenges particularly in relation to ensuring a quality placement and managing two students while acknowledging there were also opportunities for peer learning.
(N = 28) senior nursing students in 4 group discussion	Nursing students reported general satisfaction concerning peer learning due to much more in-depth learning with little stress than conventional learning methods.
(N = 16) dietetics students and (N = 35) practice educators	Implementing the PAL placement model at just two sites increased placement capacity. Students on PAL placements reported a good learning experience ($p < 0.001$) and a satisfactory workload ($p = 0.005$) more frequently than those on a traditional 1:1 placement.
Nursing students (N = 85), faculty members (N = 4), DEU nurses (N = 45)	The DEU nurses, students, and faculty were all positive about the clinical learning experience despite the steep learning curve associated with implementing the DEU model for the first time.
(N = 7) nursing students in NUR 209, (N = 6) nursing students in NUR329	Competence and confidence post-test means increased in each course. Positive nursing staff student relationships and enhancement of an already existing academic clinical site partnership also resulted.
(N = 24) physiotherapy students, (N = 20) assessors, (N = 24) clinical educators for performance assessment	There were no significant between-group differences. Clinical educator satisfaction and student satisfaction were higher with the traditional model.
(N = 24) physiotherapy students and (N = 12) clinical educators	While PAL adds to the clinical learning experience, it is not considered to be a substitute for observation of the clinical educator, expert feedback and guidance, or hands-on immersive learning activities.
(N = 144) nursing students (N = 90 DEU; N = 54 traditional)	Standardised test scores showed that differences between the clinical groups were not statistically significant.
(N = 62) year one nursing students and (N = 73) and year three nursing students of a total of 180 students (RR = 76%)	The peer learning activities were evaluated as supportive and relevant for learning. The peer learning model seems to have the potential to be a sound educational model complementing the more traditional ways of supervision.

(Continues)

TABLE 2 (Continued)

Reference	Country	Study aim(s)	Research methods
Stenberg et al. (2020)	Sweden	To explore precepting nurses' experiences of using structured learning activities as part of the peer learning model during clinical placement.	Qualitative: written answers to two open-ended questions.
Tai, Molloy, et al. (2016)	Australia	To explore the perceived role of PAL in building evaluative judgement in the workplace setting	Qualitative: observations, interviews and a free text survey
Tai et al. (2017)	Australia	This study aimed to (a) describe the frequency and nature of PAL activities and (b) explore students' experiences of PAL activities to identify the features of successful PAL interactions	Qualitative: ethnographic approach and educator interviews
Tweedie et al. (2019)	UK	To report findings from collaborative model trialled in the period 2016–2017 in midwifery	Qualitative evaluation of the trial - student feedback
Underwood et al. (2019)	UK	To evaluate the implementation of a pilot trial using the collaborative learning model in mental health	Qualitative: Plan Do Study Act (PDSA) cycle
Van der Riet et al. (2018)	Australia	To explore third-year nursing students' perceptions of being involved in a collaborative model of clinical placements (CCPM)	Descriptive qualitative research design—focus group
Wareing et al. (2018)	UK	To evaluate the experiences by mental health nursing students of a team mentoring model called Coaching and peer-assisted learning (C-PAL)	Qualitative and interpretivist design—focus groups
Williamson, Kane, et al. (2020)	UK	To evaluate the implementation of the Collaborative Learning in Practice (CLIP) model in South West of England.	Qualitative—focus groups

(DEU) model (Crawford et al., 2018; Galuska, 2015; George et al., 2017; Hannon et al., 2012; Masters, 2016; Mulready-Shick & Flanagan, 2014; Mulready-Shick et al., 2013; O'Lynn, 2013; Rhodes et al., 2012; van der Riet et al., 2018; Schecter et al., 2017; Smyer et al., 2015) since it is the most established and researched model since its development in 1999 in Australia (Edgecombe et al., 1999). The model is based on a close partnership between the academic education provider(s) and the practice placement provider(s) and aims to provide a positive learning environment by which staff nurses who would like to teach as clinical instructors (CI) are prepared for the role and by a continuity of students with the CIs for the placement durations (Masters, 2016).

The second subgroup is 'the collaborative clinical education model' (Barnett et al., 2010), which was set-up a few years after the DEU in a rural hospital in Southern Australia. It also emphasised the collaboration between the academic institutions and the health service provider to increase placement capacity. It streamlined placement opportunities by introducing a shared clinical calendar and preparing preceptors intensively to be suitable teachers and role models for the students (Barnett et al., 2010).

The third subgroup are the clinical learning environments and student wards in Sweden (Ekstedt et al., 2019; Hellstroem-Hyson et al., 2012; Mamhidir et al., 2014; Pålsson et al., 2017), which appear to be quite similar to a DEU model, but have not been explicitly labelled as such. In student-dedicated units or wards, students are usually supervised in pairs by one dedicated preceptor integrated into a larger team and the students have joint responsibility for a small group of patients.

The fourth subgroup is the 'The developing and Learning Care Unit', a model based on the lifeworld-led learning approach, which pairs a senior and junior students to work together while being supported by a team of supervisors, who employ a reflective approach to learning (Holst & Hörberg, 2012, 2013; Holst et al., 2017). It needs to be noted that this subgroup could have been placed under the 2:1 model, but since it was a team of supervisors responsible for the students it was placed in the collaborative model column.

The fifth and sixth subgroups are placement model approaches trialled in the UK. The subgroup Collaborative Learning in Practice (CLIP; Harvey & Uren, 2019; Hill et al., 2020; Tweedie et al., 2019;

Sample size / Participants	Results
(N = 62) nursing preceptors	The preceptors perceived structured learning activities as beneficial for increased collaboration and reflection among students. Moreover, utilising the structured learning activities was perceived to be time saving for the preceptors, however further research is needed.
Survey responses (N = 191) medical students from three cohorts of a total of 1,189 (RR: 16%); interviews, reflective focus groups and fields notes (but participant numbers are unclear)	PAL was seen to contribute to the development of evaluative judgement in two principal ways: i) participating in PAL helped students to understand notions of quality and oriented them to the standards of practice, and ii) participating in PAL required students to make comparisons in relation to those standards.
(N = 6) medical students	On average, students used PAL for 5.19 hours per week in a range of activities, of a total of 29.29 hours undertaking placements. PAL was recognised as a means of vicarious learning and had greater perceived value when an educator was present to guide or moderate the learning. Trust between students was seen as a requirement for PAL to be effective.
Midwifery students (number unclear)	Keys to success included good preparation of the clinical placement areas and supported from a practice educator.
2 focus groups: 1 nursing student, 1 mentor group (participant numbers unclear)	Overall a positive experience. Findings from the evaluation revealed that students benefitted from being able to work autonomously and were able to enhance their leadership and management skills.
(N = 14) nursing students in focus group	The findings from this study indicate that the CCPM may hold some promise in decreasing student stress, whilst engendering a greater sense of belonging for students.
(N = 15) mental health nursing students in 2 focus groups	Students' overall experience of piloting C-PAL was positive. Learning opportunities appeared to be dependent on the quality of peer support, which in turn, enhanced the learner experience and increased the level of student confidence. Less positive experiences included inadequate preparation, poor understanding of the model and competition for learning experiences.
(N = 40) CLiP nursing students in 4 focus groups and (N = 8) clinical practice staff in 2 focus groups	CLIP offers benefits to students who are exposed to the reality of nursing practice from the beginning of their placement experiences, enabling them greater responsibility and peer support than under normal mentoring arrangements. Participants saw benefits accruing from peer learning, 'coaching' as opposed to mentoring and support of friendly peers in placements.

Underwood et al., 2019; Williamson, Kane, et al., 2020) as well as the subgroup Coaching and peer-assisted learning (C-PAL; Wareing et al., 2018) utilise a coaching approach by the educators. Educators support a small group of students from mixed levels (i.e. senior, mid-level and junior) to work collaboratively looking after patients/clients and to facilitate peer learning between them.

4.3 | Studies by model group and type of research

The authors further created a table to present the research sorted by model groups and research methodology (see Table 4).

4.3.1 | Peer learning

There were eight studies focussing on peer learning and specific peer learning interventions (see Table 4), which all relied on qualitative methods; data were gathered mainly from the student perspective

and with mostly positive outcomes. All studies reported the established benefits of peer learning, although noteworthy are Tai, Molloy, et al. (2016) and Bennett et al. (2015) findings. Tai, Molloy, et al. (2016) and Tai et al. (2017) observed the occurrence and opportunities for peer learning with medical students in training (Tai et al., 2017) and measured the effect on the students' evaluative judgement (Tai, Molloy, et al., 2016). Bennett et al. (2015) examined PAL activities between medical students, but these PAL interventions were not monitored by a clinical educator, leaving the students to work in small groups of 4–5 people using self-directed learning (Bennett et al., 2015). Two competing activity systems, which were 'learning from experts' and 'learning from peers', were identified (Bennett et al., 2015). Since time and access to experts was limited on clinical placements, 'learning from experts' was the preferred system because it allowed students to build their professional identity with the expert as the role model and teacher (Bennett et al., 2015). A similar finding was established by Tai, Molloy, et al. (2016) when students and supervisors were asked for a preference. Trust had to be built up over time for students to be confident to learn from each other (Bennett et al.,

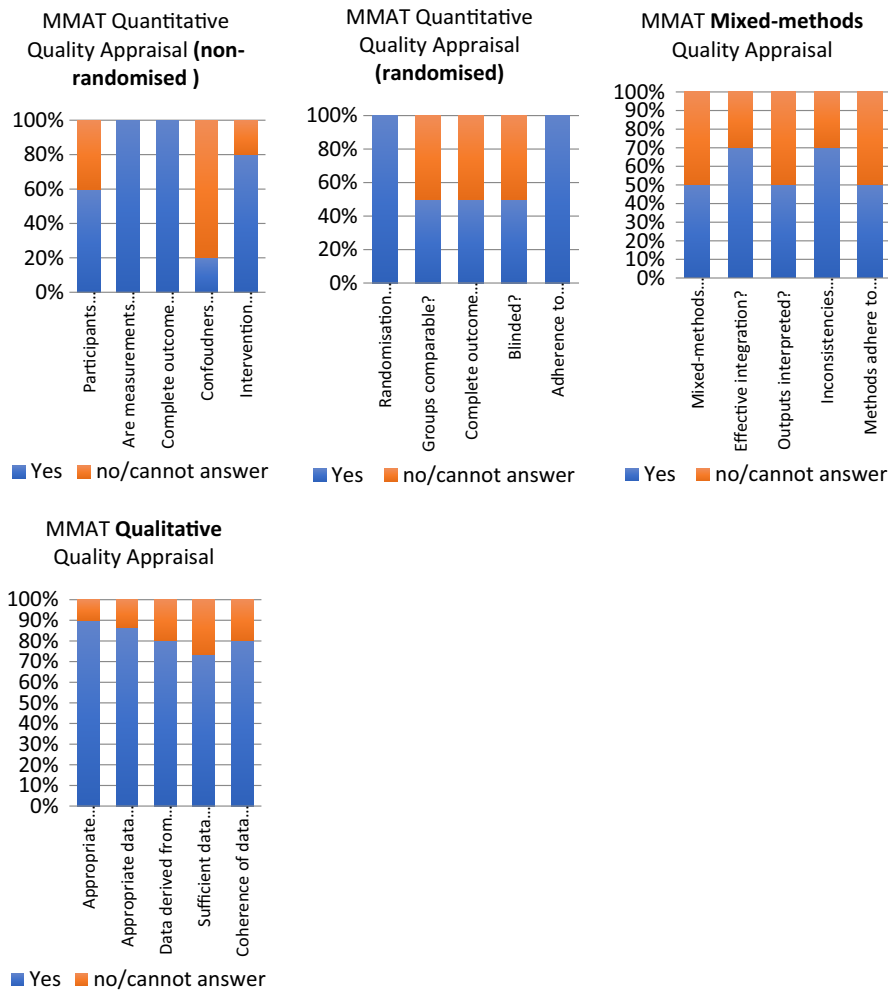


FIGURE 2 Quality appraisal tables

2015; Tai, Canny, et al., 2016) and giving negative feedback to peers was an issue for students (Bennett et al., 2015). Also worth mentioning are PAL interventions involving peer teaching (Ravanipour et al., 2015) and *near peer teaching*, which involves students from the same course, but at different levels (Alfaro et al., 2019). Both were found to be beneficial to the student experience, although not entirely conclusively. On the one hand, peer teaching resulted in an increase in self-confidence, skill accuracy, and a decrease in stress and practical mistakes, on the other hand, the dependency on others to perform the activities (during peer teaching sessions) reduced the opportunity to display individual capabilities (Ravanipour et al., 2015).

4.3.2 | 2:1 models

Overall, evidence found on the 2:1 supervision model presents mixed outcomes and appears as inconclusive when compared with other supervision approaches. Ten studies utilised the 2:1 model in Allied Health (Alpine et al., 2019; Dawes & Lambert, 2010; Jelley et al., 2010; Lynam et al., 2015; McPake, 2019; O'Connor et al., 2012; Price & Whiteside, 2016; Reidlinger et al., 2017; Sevenhuysen et al., 2014, 2015), and it was noticeable that with more recent studies more structured approaches to the

2:1 supervision emerged (Alpine et al., 2019; Lynam et al., 2015; McPake, 2019; Price & Whiteside, 2016; Reidlinger et al., 2017; Sevenhuysen et al., 2015). In Allied Health six studies were qualitative, three were mixed method and one was a RCT. Most studies elicited views from students and educators, except for Price & Whiteside (2016) and Lynam et al. (2015) who collected feedback from staff and educators only.

Of the studies that found mixed results with the 2:1 model, two studies were notable. Sevenhuysen et al. (2014) carried out a blinded, randomised crossover trial to establish the efficacy and acceptability of the 2:1 model employing PAL activities versus the usual approach to supervision. The results of the trial suggested no significant between-group differences in the Assessment of Physiotherapy Practice scores as rated by the blinded assessor, the supervising clinical educator or the students (Sevenhuysen et al., 2014). Sevenhuysen et al. (2015) followed up the trial results with focus groups held with students and clinical educators. The clinical educators reported being challenged by the mandated frequency of tasks in the prescribed PAL model and many described their use of a more flexible model with structured PAL activities at the beginning of the placement and a progression towards independent practice towards the end (Sevenhuysen et al., 2015). Similarly, mixed results were found by a number of other studies. Reidlinger et al. (2017) had collected overall

TABLE 3 Overview table of groups and subgroups of models

Peer learning	2:1 Models (2 students: 1 educator)	The Collaborative learning models (2 or more students: 1 daily educator +extra educators)
Observations of ad hoc peer learning Tai, Molloy, et al. (2016) Tai et al. (2017)	Allied Health Dawes and Lambert (2010)	Dedicated education unit (DEU) Crawford et al. (2018)
Peer learning interventions Carey et al. (2018) Bennett et al. (2015) Graelish et al. (2019) Christiansen and Bell (2010)	Physiotherapy / Occupational therapy O'Connor et al. (2012) Sevenhuysen et al. (2014) Sevenhuysen et al. (2015) Alpine et al. (2019)	Galuska (2015) George et al. (2017) Hannon et al. (2012) Masters (2016) Mulready-Shick et al. (2013) Mulready-Shick & Flanagan (2014)
Peer teaching interventions Ravaniour et al. (2015) Alfaro et al. (2019)	Price & Whiteside (2016) Jelley et al. (2010) Radio Therapy McPake (2019) Dietics Reidlinger et al. (2017) Lynam et al. (2015) Nursing Structured learning activities Sternberg and Carlson (2015) Stenberg et al. (2020) Nygren and Carlson (2017)	O'Lynn (2013) Rhodes et al. (2012) Schechter et al. (2017) Smyer et al. (2015) Van der Riet et al. (2018) The collaborative clinical education model Barnett et al. (2010) Clinical learning environments / Student wards Hellstroem-Hyson et al. (2012) Mamhidir et al. (2014) Ekstedt et al. (2019) Pålsson et al. (2017) The Developing and Learning Care Unit Holst and Hörberg (2012) Holst and Hörberg (2013) Holst et al. (2017) Col laborative Learning in Practice (CLiP) Hill et al. (2020) Tweedie et al. (2019) Underwood et al. (2019) Williamson, Kane, et al. (2020); Williamson, Plowright, et al. (2020) Harvey and Uren (2019) Coa ching and peer-assisted learning (C-PAL) Wareing et al. (2018)

positive results suggesting the PAL model offered a good learning experience, however, raised concerns about its transferability to other clinical environments. Alpine et al. (2019) found an improved learning experience (more discussion and reflection, emotional support through peer) but also unhealthy competition between students and an increased time commitment for supervisors. Similarly, McPake (2019), when he used a mixed-method approach to compare a single student model (1:1 supervision) with the paired supervision model, found educators reporting challenges caused by differences between students' personalities, learning styles and capabilities. Jelley et al. (2010) were the only study in this group to include an intradisciplinary sample; a pilot study with three physiotherapy (PT) and three physiotherapy assistants (PTA) students. Using a twofold model consisting of collaborative practice and reciprocal peer teaching (RPC) the students were supervised in pairs by a clinical instructor (CI) and a qualified PTA (Jelley et al., 2010). Findings suggest that the shared supervision model was an effective means to improve competencies in collaborative practice such as communication, consultation and assignment of tasks (Jelley et al., 2010).

Price and Whiteside (2016) elicited strategies for supervisors, which included relevant preparation with up-to-date evidence-based

knowledge, setting joint goals with students, and making some individual time for students if requested as well as encouraging a positive learning environment by collaborating with others and maintaining a positive attitude.

Amongst the studies that looked at the 2:1 model in nursing placements, Stenberg & Carlson (2015) found statistically significant differences concerning the peer learning activities for first- and third-year nursing students. Experiences were generally more positive for those in the first year than in third year. Nygren and Carlson (2017) investigated the use of *structured learning activities* from the perspective of the educators by interviewing them. Alongside the known benefits and challenges of the collaborative model, they elicited that precepting two students implied professional development (e.g. learning the latest evidence in their nursing field and carry out multi-tasking; Nygren & Carlson, 2017). Further educator feedback collected by Stenberg et al. (2020) re-enforced the key strength of the model such as collaboration in learning and deeper reflection. A perceived knowledge or skills imbalance between students was seen as beneficial by preceptors since the more experienced student would take on the role as the teacher and the less experienced student could catch up without feeling any pressure of being assessed (Stenberg et al., 2020).

TABLE 4 Studies by model group and research approach

Reference	Model	Quant - RCT	Quant - non-RCT	Mixed methods	Qual	Number of participants
Group		Peer learning				
Alfaro et al. (2019)	Nursing				X pilot	10 students
Bennett et al. (2015)	Medics				X pilot	24–30 students
Carey et al. (2018)	Nursing				x	17 students
Christiansen and Bell (2010)	Nursing				x	54 students
Grealish et al. (2019)	Nursing				x	72 students
Ravanipour et al. (2015)	Nursing				x	28 students
Tai, Molloy, et al. (2016)	Medics				x	191 students
Tai et al. (2017)	Medics				x	6 students
Group		2:1 models				
Alpine et al. (2019)	Allied Health			X pilot		10 students 10 educators
Dawes and Lambert (2010)	Allied Health				x	13 educators
Jelley et al. (2010)	Allied Health				X pilot	6 students 12 educators
Lynam et al. (2015)	Allied Health				X pilot	n/a staff
McPake (2019)	Allied Health				x	13 students 15 educators
O'Connor et al. (2012)	Allied Health				x	8 students 12 educators
Price and Whiteside (2016)	Allied Health				x	8 educators
Reidlinger et al. (2017)	Allied Health			X pilot		16 students 35 educators
Sevenhuysen et al. (2014)	Allied Health	x				24 students 24 educators 20 assessors
Sevenhuysen et al. (2015)	Allied Health					24 students 12 educators
Stenberg and Carlson (2015)	Nursing			x		135 students
Nygren and Carlson (2017)	Nursing				x	12 educators
Stenberg et al. (2020)	Nursing				x	62 educators
Group		Collaborative learning models (all Nursing)				
Crawford et al. (2018)	DEU			X pilot		24 students 42 staff
Galuska (2015)	DEU			x		32 students 7 educators
George et al. (2017)	DEU		x			193 students
Hannon et al. (2012)	DEU				x	n/a students n/a staff
Masters (2016)	DEU			x		29 students 7 educators
Mulready-Shick et al. (2013)	DEU	x				165 students
Mulready-Shick and Flanagan (2014)	DEU				x	34 staff
O'Lynn (2013)	DEU			X pilot		313 students n/a staff
Rhodes et al. (2012)	DEU			x		84 students 49 educators

(Continues)

TABLE 4 (Continued)

Reference	Model	Quant - RCT	Quant - non-RCT	Mixed methods	Qual	Number of participants
Schechter et al. (2017)	DEU		X pilot			13 students
Smyer et al. (2015)	DEU		x			144 students
Van der Riet et al. (2018)	DEU				x	14 students
Barnett et al. (2010)	<i>The collab. Clinical education</i>			x		79 students n/a staff
Ekstedt et al. (2019)	<i>Learning environment / student wards</i>		x			244 students
Hellstroem-Hyson et al. (2012)	<i>Student wards</i>				x	8 students
Mamhidir et al. (2014)	<i>Student wards</i>				x	18 educators
Palsson et al. (2017)	<i>Learning environment / student wards</i>		x			70 students
Holst and Hörberg (2012)	<i>The developing and learning Care Unit</i>				x	12 students
Holst and Hörberg (2013)	<i>The developing and learning Care Unit</i>				x	12 students
Holst et al. (2017)	<i>The developing and learning Care Unit</i>				x	25 supervisors
Harvey and Uren (2019)	CLiP				X pilot	n/a students / staff
Hill et al. (2020)	CLiP			x		607 students
Tweedie et al. (2019)	CLiP				x	n/a students / staff
Underwood et al. (2019)	CLiP				X pilot	n/a students / staff
Williamson, Kane, et al. (2020) and Williamson, Plowright, et al. (2020)	CLiP				x	40 students 8 educators
Wareing et al. (2018)	C-PAL				X pilot	15 students

4.3.3 | Collaborative placement models

There were 26 articles, providing evidence for six collaborative placement models: DEU, the collaborative clinical education model, the clinical learning environments / student wards, Developing and Learning Care Unit, CLiP and C-PAL.

One of these, the DEU model, has been implemented in at least 3 countries, 'the clinical learning environments / student wards' and 'the developing and Learning Care Unit' were implemented in Sweden and the two coaching-based collaborative approaches, CLiP and C-PAL, only in the UK.

4.3.4 | DEU

Most research has been carried out on the DEU model: one RCT, two quantitative studies (of which one is a pilot study for a DEU in a different context), four mixed method studies (of which two were pilot studies) and three qualitative studies. Data were collected mostly from students, but also from educators. Overall, the research outcomes point towards positive results with one study providing inconclusive outcomes when compared to the traditional

1:1 supervision. In a randomised, controlled, multiyear, multisite study, Mulready-Shick et al. (2013) reported positive clinical education experiences for all students, but DEU students reported significantly more positive learning experiences on all measures using the Student Evaluation of Clinical Education Environment (SECEE) instrument, the Growth in Clinical Learning Scale, and the Quality and Safety Competency Development Scale. George et al. (2017) found similar results, in that the DEU model increased student self-efficacy. These results can be contrasted to Smyer et al. (2015) who utilised a longitudinal quasi-experimental repeated measures design and did not find any statistically significant difference between the groups.

Other studies (Hannon et al., 2012; Rhodes et al., 2012; Schechter et al., 2017) also have confirmed the established benefits especially the aspect of increasing student confidence. There have been two studies where the DEU model was used to integrate aspects of the curriculum such as Quality and Safety Education (Masters, 2016) and leadership behaviours (Galuska, 2015). In New Zealand, Crawford et al. (2018) evaluated a DEU pilot, working with students from three undergraduate programmes across two education providers, which was different to the original model, where one education provider works exclusively with one

placement provider. Apart from overall positive findings (91% of student and 85% staff were satisfied), Crawford et al. (2018) noted role clarity was an issue for nurses and students and that Academic Liaison Nurses were expected to be seen more on the DEU ward. O'Lynn (2013) conducted a pilot study, albeit comparatively large in data collection, on a DEU involving a long-term care provider (DEU-LTC). The research concludes that adult health students placed on the DEU-LTC performed equally well to classmates placed on DEUs based in acute care hospitals on simulations, examinations and course grades (O'Lynn, 2013). In Australia, a collaborative clinical placement model (CCPM) has been established as a variation of the DEU and it was found to be of particular benefit to mature students who had caring duties since it allowed them to plan their time more effectively and to reduce travel time by staying with one placement provider (van der Riet et al., 2018).

4.3.5 | The collaborative clinical education model

Evidence on the *collaborative clinical education model* is provided by only one participatory study (Barnett et al., 2010) using a comparatively small sample of participants and stakeholders. The key outcomes were the establishment of a positive learning philosophy in the hospital environment (e.g. where all staff took part in interprofessional learning), a supported and rewarded preceptorship program as well as the role of a dedicated clinical facilitator to support preceptors (Barnett et al., 2010). A noteworthy point is that, due to the rural context of this hospital, whose workforce consisted of a considerable amount of part time staff, the number of preceptors to be trained increased to double that anticipated at the beginning of the project.

4.3.6 | The clinical learning environments and student wards

Relative to other collaborative models, strong evidence was found to support the clinical learning environments and student wards with four studies (Ekstedt et al., 2019; Hellstroem-Hyson et al., 2012; Mamhidir et al., 2014; Pålsson et al., 2017), two of which were quantitative eliciting data from students and two were qualitative eliciting data from students and educators. Pålsson et al. (2017) employed a quasi-experimental design to investigate the effects of peer learning in clinical practice education on nursing students' self-rated performance. Results showed improvements for the intervention group (i.e. peer learning group) over time and deterioration for the comparison group (i.e. traditional supervision; Pålsson et al., 2017). Ekstedt et al. (2019) employed the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) scale to measure the key dimensions of the placement experience. Results showed that both groups (traditional supervision and peer supervision) had positive experiences of the clinical learning environment and with the supervisory relationship. Significant differences between the models were found around

the role of the nurse teacher, the preceptors' role and in the preparedness for supervision, which demonstrated that supervision was better organised in the collaborative learning environments in terms of resources, staff's approachability and role clarity (Ekstedt et al., 2019). Results from Hellstroem-Hysen et al. (2012) and Mamhidir et al. (2014) re-enforce those found above, in that the collaborative model increased participation by students, which in turn increased their confidence but increased the workload for the preceptor due their role as facilitator.

4.3.7 | The Developing and Learning Care Unit

Studies exploring the *Developing and Learning Care Unit* comprised two qualitative studies eliciting experiences from students (Holst & Hörberg, 2012, 2013) and one larger qualitative study with supervisors (Holst et al., 2017). Based on a phenomenological approach, Holst and Hörberg (2012) and Holst and Hörberg (2013) examined the students' learning process when being supervised in pairs of one senior and one junior student. They found this was especially beneficial at the beginning of their clinical studies to make students feel safe and that there was a fine line between supportive and unsupportive supervision (Holst & Hörberg, 2013). Meeting patients and their relatives, dealing with real emotions and having the space to learn and develop a caring style, which has room to grow were important aspects in this process (Holst & Hörberg, 2012). According to Holst & Hörberg, 2013, the learning process has to retain a rhythm and flexibility between each student within pairs and the supervisor.

4.3.8 | The CLIP model

The CLIP model has been piloted and implemented in the UK with only five studies published so far (Harvey & Uren, 2019; Hill et al., 2020; Tweedie et al., 2019; Underwood et al., 2019; Williamson, Kane, et al., 2020). Evidence for this approach is still inconclusive, albeit with promising results. The largest study was conducted by Hill et al., 2020, who employed a mixed-method approach gathering data from 607 nursing students comparing traditional (1:1) and CLIP placements using the CLES+T scale as well as focus groups and interviews. While quantitative results were mixed, qualitative results revealed clearer benefits of the CLIP model such as increased levels of responsibility, peer support, confidence, autonomy and involvement in a patient's journey. The key disadvantages recorded were the 'right mix of students' as well as sufficient student, staff and patient numbers (Hill et al., 2020). Williamson, Kane, et al. (2020) and Williamson, Plowright, et al. (2020) captured the views of 40 students and 13 educators not only on the model itself, but also on preparatory experiences for implementing CLIP. They found despite introductory sessions to CLIP for students and staff, many did not remember the meaning of CLIP, that rostering the students afforded

considerable amount of planning and that the staff and patient ratio had to be observed to ensure the students' supernumerary status (Williamson, Kane, et al., 2020). One noteworthy disadvantage uncovered by Williamson, Kane et al. (2020) and Williamson, Plowright, et al. (2020) points to an increased assessment anxiety due to the lack of the one-to-one relationship with their mentor and having to rely on coaches and other staff to communicate to assess their skills.

4.3.9 | C-PAL model

At the point of writing, the evidence on C-PAL is only provided by one pilot study (Wareing et al., 2018). After the implementation of a C-PAL, Pilot project in four in-patient mental health wards Wareing et al. (2018) held two focus groups involving 15 students. Their findings reported similar themes as found with evidence for CLIP, which were positive in respect to enhancing the learner experience and increasing students' confidence; however, inadequate preparation, poor understanding of the model and competition for learning experiences were all negative findings of the pilot study (Wareing et al., 2018).

5 | DISCUSSION

Healthcare students need to spend a considerable time of their programme in the practice setting, which is around 30% in Sweden (Pålsson et al., 2017) and a minimum of 50% in the UK for nurses and midwives (NMC, 2018). Although the hours vary for AHP students in the UK (Health & Care Professions Council, 2017) practice-based learning is a mandatory part of their curriculum. Given this is the case, it is surprising how few large scale and comparative research studies have been conducted regarding practice placement models and peer learning. Although this systematic review was time limited (2010–2020) only 2892 students and 570 educators were involved in providing evidence in these results for certain. This paucity of evidence may be explained by the complexity of undertaking such research, along with a lack of an internationally agreed nomenclature on key terms and roles. In addition, there is yet no research on student placement models considering any patient outcomes.

At the same time, it needs to be acknowledged that there is a plethora of models of supervision, in different health systems and different countries with a variety of resources, which makes any comparison difficult. Likewise, the standards for healthcare students' education vary from country to country. Therefore, one of the limitations and strengths of this review is to draw together a great range of student supervision experiences.

This synthesis brings out the evidence that implementation of some form of peer learning into the practice placement model is of no doubt beneficial. It is especially helpful for junior students who might feel anxious on their first placement and would appear to benefit from having a peer for support.

If a placement provider has not yet incorporated peer learning, the most appropriate model may be largely dependent on a range of contextual factors. That is, providers should consider the question of 'how many' students can be placed in any one placement at the same time and in 'what way' students could be partnered together (i.e. mixing year groups or partnering students for specific activities) among other factors (e.g. business of the health services, number of supervisors available). As Price and Whiteside (2016) noted, not all peer learning tutorials were helpful during the time of the placement, especially those facilitated from a more generic provider above because students were then not available when clinical opportunities arose.

Evidence for the 2:1 models and the collaborative models showed mixed outcomes when compared with the traditional 1:1 model. However, the more recent studies showed improved outcomes for the collaborative models (Ekstedt et al., 2019; George et al., 2017; Pålsson et al., 2017; Schecter et al., 2017), especially the DEU models, which aim to create a positive learning environment. Evidence further establishes that both concepts 'learning from peers' and 'learning from experts' have their place and a combination of those is of benefit in practice placements. Those studies, which indicated a student (and educator) preference for expert-led learning emphasise the value of learning from experts, who act as role models, teachers and protectors (Sevenhuysen et al., 2014; Tai, Canny, et al., 2016). In this trusting 1:1 relationship, the hidden curriculum is more likely to be taught (Tai et al., 2017), although the latter could also be discussed in specific Peer learning interventions such as learning circles (Grealish et al., 2019). Also, to consider are the needs of senior students, who are approaching the end of their time as students in practice, and would like to learn from the expert (rather their fellow student) on clinical reasoning and prioritisation of tasks as well as organisational and leadership skills. Furthermore, the suitable mix of students is important in the collaborative models and Hannon et al. (2012) explicitly asked for Higher Education Institutions (HEIs) to support the matching of students for the placement.

Those studies, which highlight the benefits and effectiveness of collaborative models, need to be understood in the context of providing an improved learning environment and not only for students, but also for the educators. For example, Pålsson et al. (2017) and other DEU research find students and educators are each learning in their roles and staying abreast with latest evidence-based research. Educators need to have particular characteristics; namely, someone who is passionate about students, their learning journey and who is happy to share their knowledge and experience. Ideally, educators receive formal recognition for their work and role and have access to training and support as it is offered with the *structured learning activities*, DEU, CLIP and C-PAL models through the close collaboration with the HEIs and additional personnel such as the 'clinical educator'.

One study (Jelley et al., 2010) had shown that a 2:1 model was also suitable for intradisciplinary peer learning, thus indicating that collaborative placement models provide opportunities

for interdisciplinary and interprofessional learning. The collaborative mindset in students and supervisors is likely to facilitate the mixing of students from different disciplines and their learning, thus supporting effective interprofessional education, which consequently is a more efficient use of resources (World Health Professions Alliance, 2019).

As it currently stands, research on the DEU model leads the way in terms of the number of studies conducted and participants involved, thus providing evidence on the quality of the learning environment. However, variation in the implementation of DEU models indicates another issue affecting the collaborative models, namely 'role clarity'. Considering the number of quantitative and mixed-method research conducted with the DEU model, a meta-analysis of their results could be undertaken. The CLIP and C-PAL models are still emerging in regard to practical implementation. Decision makers and implementers will also need to address the issue of how they label the roles and divide the tasks between the educators and providers involved. Research with collaborative models demonstrates how the role of the educator changes to being a facilitator of learning rather than a direct teacher by role modelling and evaluating. The coaching approach to supervision and its translation into real world environments needs to be examined and its difference established to other styles such as a reflective adaptive style (Holst et al., 2017) or with *structured learning activities* (Stenberg et al., 2020).

Decision makers in student education should review which model might work best with their circumstances such as geographical location, the focus and business of the placement area, experience level of staff and turnover as well as availability and access to suitable learning areas in the clinical environment and not least the needs of the students.

The evidence for the models provided in this review can be seen as a roadmap for implementing a collaborative model incrementally. It could start with peer learning activities, scaling up to a 2:1 model, whilst educators could also grow with the role and as the next step, the wider collaborative model such DEU or CLIP could be implemented.

For any of these activities, buy-in by service managers and practitioners needs to be secured in support of this organisational culture change. In order to make informed decisions, more research is needed, specifically more evidence for the different models with research that is longitudinal, uses larger groups of students and educators, as well as consideration of learning and patient/client outcomes.

5.1 | Limitations

This literature review has several limitations. The search date was restricted to being from 2010, excluding all earlier studies, especially earlier studies in Allied Health were therefore excluded. A considerable number of DEU studies were retrieved through pearl searches and the authors are aware that there is more research on the DEU model, but the intention was to provide an overview of the evidence for peer learning and collaborative models in practice and felt that twelve DEU studies were sufficient to present its benefits

and challenges. Books and conference papers were excluded and a search of grey literature was not performed. The search was restricted to English language only. Undoubtedly, there will be other clinical placement models for collaborative learning in other parts of the world such as Japan, China, India, Brazil or Europe, which are not presented in these results. The heterogeneity of the quantitative research did not allow for a meta-analysis, thus a qualitative synthesis was conducted.

6 | CONCLUSION

Results of this review demonstrate clear evidence for the benefits of peer learning during practice placements in health care. Having both formal and informal peer learning opportunities are beneficial to students since they are able to communicate and practise with someone who is in a similar learning position. This reduces stress and anxiety and other challenges of clinical practice are mitigated by peer support. Results of this review found that junior students benefit more from peer learning activities than more senior students. However, in more senior students, it was found that peer learning can increase confidence and ability to perform some skills, including team working skills, which prepares them even more for the transition work as qualified staff. There is also promising evidence for the pairing of junior and senior students, where both levels of students experience benefits, one as a learner from someone relatable and the other in solidifying their knowledge and preparing to be a possible supervisor after graduation. Results show there is not enough evidence to provide a clear recommendation on which collaborative model to implement but most research has been conducted with DEUs and these were shown to yield mostly positive results overall. Nevertheless, other models in the UK and Sweden, which are still emerging, have also promising results and more research should be conducted to evaluate their benefits and challenges.

6.1 | Relevance to clinical practice

This integrative review provided a comprehensive overview of peer learning and collaborative practice placement models in health care, synthesised their benefits and challenges, and highlighted the existing amount of (or lack of) evidence for those interventions. This overview aims to assist decision makers to make more informed decisions in choosing and implementing a future peer learning and collaborative placement model considering the specific context of their trust, clinical or community service. It also highlights that the education provider and placement provider need to collaborate closely and prepare their staff as educators and their students when implementing a collaborative model to ensure understanding of its philosophical approach. The use of organised schedules and structured activities, including scripted peer observation, is likely to be of assistance, especially at the beginning of practice placements with more junior students.

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CONFLICT OF INTEREST

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AUTHOR CONTRIBUTIONS

MM: Literature search, appraisal, data analysis, data representation, manuscript drafting and editing. HB: Review literature, data analysis, review and editing of manuscript. RE: Literature appraisal, review and editing of manuscript. CY: Review and editing of manuscript.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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