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Research Article

Simulated Placements as Partial Replacement of Clinical Training Time: A Delphi Consensus Study

Pete Bridge, PhD*, Joanne Adeoye, MMEd Sci, Christopher N. Edge, MSc, Vicky L. Garner, MSc, Anne-Louise Humphreys, PhD, Sarah-Jane Ketterer, MSc, Joanne G. Linforth, MSc, Anthony S. Manning-Stanley, MSc, David Newsham, PhD, Denise Prescott, MBA, Samuel J. Pullan, MSc, Jo Sharp, MSc

School of Health Sciences, University of Liverpool, Liverpool L69 3GB, UK

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Abstract

Background: There is growing interest in utilizing structured extended periods of simulation as partial replacement for clinical placement (PRCP) due to workforce demands and COVID-19 impact. This project aimed to identify the extent to which stakeholders felt that simulated placements could reduce overall clinical placement time requirement for health care students.

Method: Participants included a range of nurses and Allied Health Professionals including managers, clinicians and lecturers. A three-round Delphi study was conducted with a 75% consensus agreement target.

Results: Overall, 71 participants engaged with at least one round of the study and identified benefits of PRCP: Safety, learning from mistakes, improved preparation, and reduced placement training burden. Challenges included poor realism, logistics, time, and access to facilities.

Conclusions: The consensus opinion indicated that between 11% and 30% of clinical training time could be replaced with simulated placement. Ongoing work will need to identify profession-specific consensus opinion and guidance on the use of simulation as PRCP.

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* Corresponding author: pete.bridge@liverpool.ac.uk (P. Bridge).

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Introduction

A major component of preregistration nursing and Allied Health Professional (AHP) student training is a series of clinical learning placements where students perform clinical tasks under supervision, gaining technical and interpersonal skills. These placement blocks are essential opportunities for students to apply theoretical learning to patient care, gain competence in clinical work and develop into safe practitioners. Validation of nursing and AHP preregistration programs including physiotherapy and occupational therapy, typically mandates a minimum of 1000-2300 clinical placement learning hours in order to satisfy professional and regulatory body requirements (Health & Care Professions Council, 2018; Nursing & Midwifery Council, 2019). Conversely, other professions including radiography and orthoptics, do not mandate clinical placement hours. Therefore there is variation in the proportion of time allocated to practice placements in each professional program ranging from around 10% to 50% of their course time.

Recent evidence has demonstrated the challenges of implementing and supporting these placements (Ketterer, Callender, & Warren, 2020). High clinical workloads, especially post-COVID-19 (Glasper, 2020), increasing complexity of equipment and techniques as well as a constant need for more learners (Health Education England, 2020) in the workplace to increase staffing requirements all stretch capacity agreements of the receiving placement area, and combine to threaten the effectiveness of the clinical placement experience.

Simulation is a well-established training method that allows learners to practice aspects of clinical practice in a less-pressured environment away from the clinical department with no risk of harm to patients (Sears, Goldsworthy, & Goodman, 2010 Jan). It encompasses a range of tools and methods that have been used to great success for many years (Alinier, 2007; Owen, 2016). Most simulation-based activities are used as discrete learning opportunities throughout curricula as part of academic modules (Alinier, 2007), yet there is growing interest in developing and consolidating these into extended simulated placements. In some cases, these simulated placements have been utilized as partial replacement of clinical placement ("PRCP"). There have been nine controlled experimental studies and systematic reviews published in the literature from 2000 onward (Ketterer et al., 2020; Curl et al., 2016; Hayden et al., 2014; Hill, Ward, & Heard, 2020; Imms, Froude, & Chu, 2018; Larue, Pépin, & Allard, 2015; Soccio, 2017; Tuttle & Horan, 2019; Watson, Wright, & Morris, 2012) including a large-scale national study (Hayden et al., 2014) with most authors agreeing that PRCP using a range of simulation activities is feasible and in some cases can lead to improvements in clinical skills gain (Hayden et al., 2014; Ketterer et al., 2020; Soccio, 2017). Most studies agree there is a need for provider investment into simulated placement resources and a requirement for adequate training and debriefing sessions to ensure optimal use is made of facilities. The other most common theme from the literature is the need for more robust research to establish the exact role of simulated placements in relation to PRCP.

Published data relating to PRCP are relatively sparse and in nursing and many of the AHPs there is limited or no published evidence relating to this concept. With the exception of one large national study (Hayden et al., 2014), it is also clear that much of the existing evidence comprises self-reported student confidence as a measure rather than more objective clinical assessment outcome measures. Unsurprisingly, across the professions, there is a wide variety of both low- and high-fidelity simulation platforms, and placement lengths, with a corresponding range of suggested PRCP ratios. Although differences in use of simulation are expected, the evidence indicates a wide range of recommended ratios of PRCP from 0% to 50%; this makes it difficult to identify the appropriate extent of simulated practice.

Materials and Methods

This national study aimed to address this issue through the well-validated Delphi technique which aims to gather information from experts via an iterative process (Hsu & Sandford, 2007). Initial participant responses to prompts are gathered and then in subsequent rounds, anonymized collated responses are distributed before seeking opinions again. This process repeats for several rounds until a consensus is achieved. Opinion is divided on the nature of Delphi methods; in most cases an initially qualitative approach is utilized to inform subsequent quantitative iterations. The Delphi method is an established means of addressing conflicting findings by harvesting opinions from expert stakeholders. Specifically, this project aimed to identify the extent to which simulated placements should be used to reduce the overall clinical placement time requirement for nursing and allied health preregistration students. The research questions for the project were:

- What are the potential benefits associated with simulated placements?
- What challenges are associated with using simulated placements?
- What realistic and safe reduction in clinical placement time can be delivered through simulated placements across the different professions?

The University Human Research Ethics Committee provided ethical approval for the study, which ran from September to December 2020. There were three planned

"rounds" aiming to gather a predefined consensus of 75% agreement, which was the median threshold used in most studies (Diamond et al., 2014). The questions (see digital supplement 1) were presented via an online questionnaire (Survey Monkey, San Mateo) and distributed to participants via an email link. Consent to participate was required through the opening question. All participants received two email reminders and a completion deadline of 14 days per round.

Participants for this study were those who identified as "expert users" of simulation as defined in the literature (Diamond et al., 2014; Hsu & Sandford, 2007). Thus they were all required to have had substantial experience of delivering simulation-based education or were key stakeholders in clinical skills training. Participants satisfying these inclusion criteria were invited via existing networks, professional bodies, and social media. Participants were recruited from nursing and a range of AHPs and deliberately encompassed a range of roles including clinical staff, managers, academics and researchers as seen in the Figure 1 in the Results section.

Delphi Overview

All participants were provided with a briefing pack containing summaries of the nine published controlled experiments and systematic reviews mentioned in the introduction (Curl et al., 2016; Hayden et al., 2014; Hill et al., 2020; Imms et al., 2018; Ketterer et al., 2020; Larue et al., 2015; Soccio, 2017; Tuttle & Horan, 2019; Watson et al., 2012). They were invited to complete a series of online questionnaires seeking their opinions relating to PRCP. Participants were advised that simulated placements could comprise a combination of virtual and in-person activities and resources. The first round gathered qualitative data via open questions identifying benefits and limitations associated with simulated placements. Thematic analysis of this data provided the baseline information that formed the boundaries of the subsequent rounds. Thematic analysis was conducted by two researchers who independently identified codes from common words or phrases within the responses. After agreement had been reached, these were then combined into broad categories. In subsequent rounds participants were provided with a summary of all the previous round's responses using the same technique and asked to consider this, along with the reasons supporting and refuting PRCP before choosing their response.

Round One

In addition to the four open questions identifying benefits and limitations associated with PRCP and reasons supporting and refuting their adoption, participants were asked to provide an initial estimate, based on their own experiences, of the percentage of clinical training time that they would feel comfortable replacing with simulated placements. The qualitative data relating to the benefits, limitations, and rationale for and against PRCP were collated, tallied, and passed to participants in briefing materials ahead of Round Two.

Round Two

Rounds Two and Three generated quantitative consensus data only, based on the initial open responses from Round One. Participants were asked to identify and rank their top ten factors for each of the four questions used in Round One, based on their perceptions of which were the most influential in relation to their decisions concerning PRCP. Their rankings were used to generate a score with a total of ten marks assigned to each participant's "most important" and then nine marks for second most important and so on. These comprised the "score" for each factor and the ten factors with highest scores were presented to participants for Round Three. Participants were also asked to revisit their estimation of optimum PRCP ratio.

Round Three

Participants were presented with the top ten factors for each of the four questions where they were asked to identify and rank the top five factors. A similar method to that used in Round Two generated a final consensus ranking. Participants were also asked to consider revising their response in relation to PRCP ratio in the light of consensus opinion.

Results

Overall, 79 participants engaged with the study. Actual numbers per round varied slightly (72 in Round Two and 73 in Round Three) due to availability or other reasons not provided. Two participants who were absent from Round One asked to contribute in subsequent Rounds; the anonymous nature of the data collection prevented more detailed data collection relating to attrition and engagement. The relative distribution of professions and roles is shown in the Figure 1.

The responses to the four questions regarding the benefits and challenges of simulation in general as well as the specific reasons supporting or refuting use of simulated placement for PRCP highlighted some key themes. The primary data relating to these questions can be found in Digital Supplements 2-5, respectively.

The key benefit delivered by simulated placement was reported to be practice for clinical work and transition to placement. Safety issues in terms of a learning environment and reduced risk to patients was also an important aspect. The pedagogical value was also highlighted throughout with equity of experience, debriefing and learning from

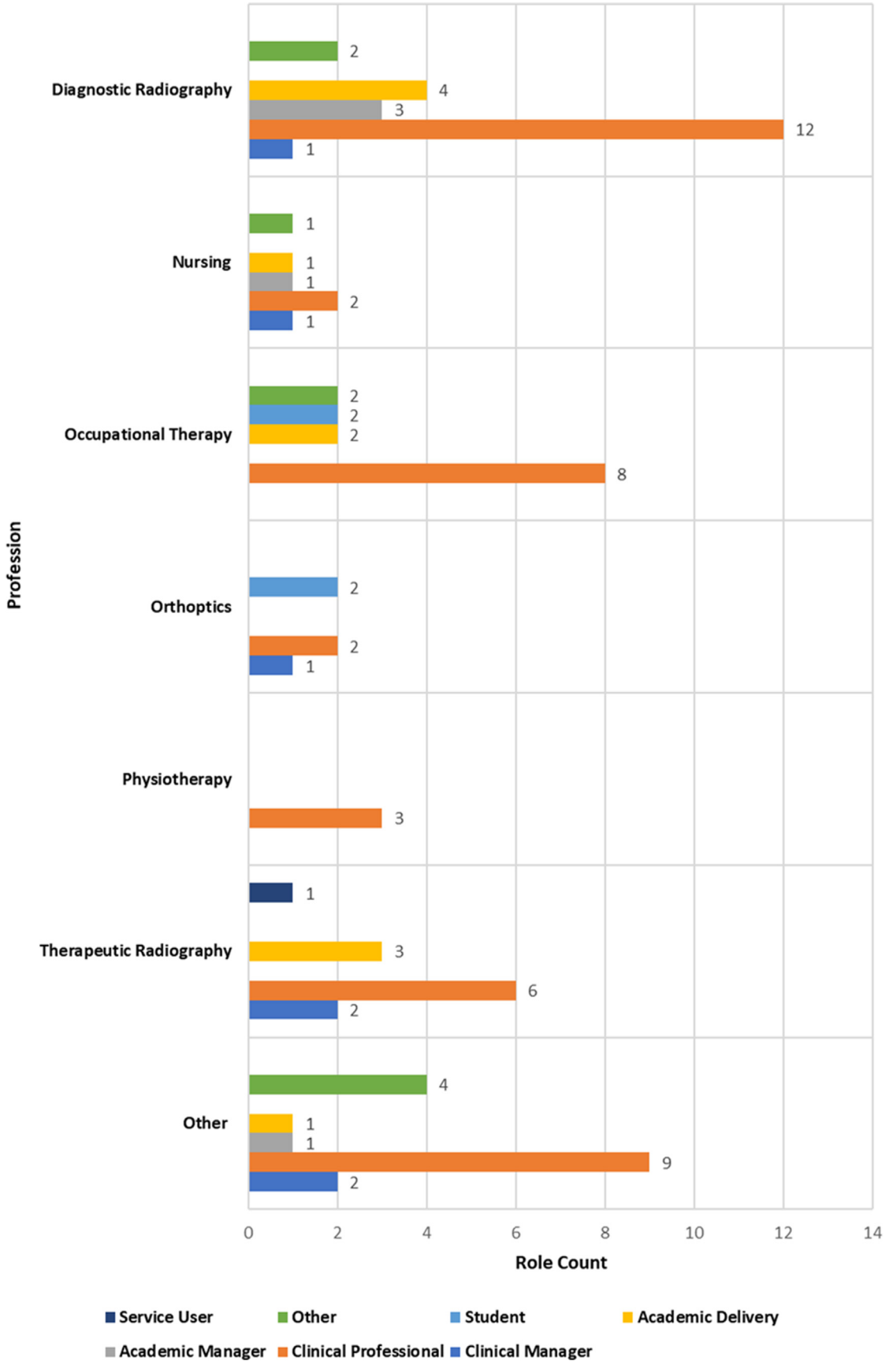

Figure 1 Demographics of Delphi participants.

Table 1 Convergence of PRCP Percentage Throughout Study.

PRCP Percentage	Round 1	Round 2	Round 3
0%-10%	27.7%	17.91%	11.54%
11%-20%	26.39%	40.30%	46.15%
21%-30%	20.83%	23.88%	28.85%
31%-50%	2.78%	13.43%	9.62%
Over 50%	4.17%	4.48%	3.85%

mistakes featuring strongly. Gains to learners in terms of confidence and skills gain were reported.

The limitations were very focused on the differences between simulated and clinical placements. The lack of patients, the predictability, and lack of realism were very common themes. Resource implications including cost, time, and training challenges were cited less frequently.

The key factors influencing adoption of PRCP aligned well to the perceived benefits of reducing training burden on placement and increasing capacity. PRCP was felt to better prepare students by providing equitable experiences in a safe environment which supported repetition and experimentation.

Factors reducing willingness to utilize PRCP also aligned with the perceived limitations of an unrealistic patient-free environment. The logistical challenge was again highlighted as a barrier to adoption. In addition, participants reported a perceived negative impact on team communication and other interpersonal skills.

The Table 1 shows participant responses to the question regarding extent of PRCP quantified by the percentage of clinical training time that they would be comfortable replacing with simulated placements. This data illustrate the percentage of participants opting for each banding of PRCP percentage and how the responses converged over the rounds until 75% of the responses agreed with 11%-30% of replacement.

Discussion

Benefits of Simulation and Simulated Placements

Beyond the accepted aims of simulation to provide training in core skills and practice ahead of or alongside placement, participants clearly valued the safety element of simulation. This related to both removing any possible risk for patients and consequently reducing the pressure on learners. Additional benefits, identified in earlier rounds, related to the ability to learn from mistakes and debriefing. This is an important aspect of simulated placement and it was good to see that participants also identified how these can combine to promote confidence and consolidate theoretical learning. These findings align well with the published evidence relating to simulation (Cant & Cooper, 2017; Shiner, 2018). It was also interesting to see participants highlight the value of simulated placements in response to COVID-19 restrictions. The reduced on-site presence in clinical departments and the requirement for social distancing on University campus facilities have meant that simulation activities have moved online or made use of small group learning and it appears that this has had useful impact during this challenging time. This finding supports the presented evidence that simulated placements can replace clinical training weeks and thus reduce the training burden on clinical departments.

There is, however, a potential conflict of aims related to implementation of simulated placements. From the perspective of the clinical departments and academic staff, these provide an opportunity to reduce the clinical training burden by limiting the number of learners in the workplace and also make clinical placements more efficient. This solution appears to be born out of necessity, given the growing challenges presented to higher education institutions (HEIs) in securing appropriate numbers of clinical placements to meet increasing demand (Beveridge & Pentland, 2020). From workforce planning organizations, however, simulated placements represent an opportunity to increase learner numbers. It is clear that both of these cannot simultaneously be accommodated and care will be needed with implementation of simulated placements with regard to this and to ensuring safe practice.

Limitations of Simulation and Simulated Placements

The main limitations identified by participants related to the perception that learning outside the clinical environment without patients would not be realistic and the concept that some things cannot be simulated. For example; learning cannulation skills on a manikin lacks the real patient response and variability. This is an interesting finding that was also cited as a reason refuting PRCP. There is perhaps a perception among the respondents that simulation aims to provide an entirely accurate clinical experience, yet in all but the most high-fidelity simulators, this is rarely an aim of the simulation. Previous findings (Ketterer et al., 2020) have highlighted how low-fidelity simulation can generate useful learning which can help to prepare learners to apply this learning to the realistic and high-pressure clinical environment. This finding suggests the need for more education around the purpose of simulated placements for both academic and clinical partners. In addition, informing learners of these aims would also reinforce the value of these placements and subsequently impact positively on their confidence and engagement. Interestingly the reduced pressure on learners was also identified as a limitation; this suggests a conflict of perceived aims and outcomes arising from simulated placements. The

development of specific guidance related to use of simulated placements may help to reduce the perception of this limitation.

The logistical challenges associated with designing and facilitating a simulated placement were clearly identified as limitations and possible reasons to refute their use. This finding supports the published data which consistently identifies the need for formal training, debriefing, staffing, and adequate resources (Curl et al., 2016; Hayden et al., 2014; Hill et al., 2020; Imms et al., 2018; Larue et al., 2015; Soccio, 2017; Tuttle & Horan, 2019; Watson et al., 2012). A formal analysis comparing the investment in academic resources with gains from possible increases in numbers of learners, with the additional intangible benefits of decreased clinical on-site presence, may help to justify this expenditure. A more collegial approach to simulated placements with sharing of simulation resources, especially anonymized case data may also be a useful solution.

Partial Replacement of Clinical Placement

With regard to replacement of clinical training time, some convergence was achieved, despite the wide range of clinical professions and roles involved. Most of the participants (88%) thought that over 10% of clinical time could be replaced with simulated placements while only a few (14%) were comfortable with percentages in excess of 30%. This contrasts with some previous studies citing 50% replacement (Curl et al., 2016; Larue et al., 2015), but aligns better with those concluding that a 25% replacement was appropriate (Soccio, 2017; Watson et al., 2012). This figure also fits well with the results of a large national study which identified benefits for PRCP ratios of 25%-50% (Hayden et al., 2014). While this consensus data provide useful recommendations of the limits to which simulated placement can be used as PRCP, further study is recommended to identify reasons for the wide range of ratios. Some of these differences may arise from varying use of simulation in different professions and also perhaps across different year groups. It should also be acknowledged that the wide variation in clinical placement hours across the professions means that this ratio relates to very different durations. The extent of fidelity of simulation or misunderstandings about the aims and outcomes of simulation and thus the requirements regarding fidelity could also be a factor in these cases.

Profession-Specific Differences

Small numbers of participants in some professions make it challenging to identify trends but there is clearly a difference in expectations of clinical placement learning with some professions requiring technical skill acquisition and others focusing more on interpersonal skills. Additional profession-specific studies could identify the extent to which these findings can be applied. The variability in understanding of the term "simulation" and the different interpretations that participants bring to the study is interesting. For example the perceived hindering of interpersonal skills development contrasts with findings from a previous study where improvements in interpersonal skills were seen in students who had undertaken a simulated placement compared to a traditional placement cohort (Ketterer et al., 2020). These perceptions may well have their basis in professional roles and clinical placement expectations.

Within the field of nursing, the UK Nursing and Midwifery Council currently mandate that for time to be classed as clinical training, the simulation must feature direct contact with healthy or sick individuals (Nursing & Midwifery Council, 2019). PRCP with simulated activity using computerized or high-fidelity electronic manikins is currently not accepted without the incorporation of a real healthy/sick individual. These findings could suggest a need for changes in opinion regarding PRCP proportions related to a wide range of activities.

Methodological Limitations

Although a good number of participants engaged in the Delphi process, this did encompass a wide range of professions and roles; as already seen this could have led to a variation in interpretation of questions and responses. The wide variation in what constitutes "simulation" between professional groups must be acknowledged; larger numbers of participants could have enabled these differences to be identified and their impact established. Follow-up studies within individual professions may help to build on these findings and achieve further convergence on PRCP ratios. The impact of COVID-19 should also be acknowledged as a limitation in terms of changing perceptions of simulation and also impacting on people's available time and willingness to engage. The anonymous nature of the data collection meant that attrition and rationale for non-participation could not be collected.

Conclusions

This Delphi study involved a range of clinical and academic-based participants from a variety of nursing and AHP professions. The consensus opinion indicated that between 11% and 30% of clinical training time can be replaced with simulated placement. Simulated placements were identified as being able to provide effective training in core skills with reduced risk to patients and learners. Reduced number of learners in the workplace was a key driver for use of simulation, but care must be taken to balance this outcome with workforce development initiatives to increase numbers of learners. There remain some significant logistical challenges associated with implementing simulated placements and additional work is needed to identify mechanisms for sharing resources and reducing

levels of investment required. There is also an apparent difference in perceptions of the aims and outcomes related to simulated placements and the need for high levels of realism. While this is an area of research controversy, it does highlight the need for simulation providers to disseminate the aims of their activities more widely. Further work confirming levels of fidelity required for simulated exercises in different professions is also recommended. Finally, it must be acknowledged that there are differences in professional roles and duties and therefore differences in how useful simulation can be and what levels of fidelity are necessary. Ongoing work will need to identify profession-specific consensus opinion on PRCP and develop appropriate guidance for use of simulated placements.

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Conflict of Interest

There are no conflicts of interest.

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