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Development of innovative simulation teaching for advanced general practice clinical pharmacists

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Abstract

Background. Advanced General Practice Clinical Pharmacists (GPCPs) are expected to manage patients by undertaking clinical assessment then make safe, competent autonomous decisions. Simulation provides a safe learning environment to develop clinical skills, but is rarely used for postgraduate pharmacist development. *Aim.* Design and deliver innovative simulation teaching to support Advanced GPCPs in Scotland. *Setting.* General Practice. *Development.* Experienced clinical pharmacy educators designed a simulation day with ten scenarios based on general practice clinical presentations. Learning objectives were mapped to the National Advanced GPCP competency framework. *Implementation.* Simulation took place at the National Skills Education Hub, Louisa Jordan National Hospital, Glasgow, November 2020. Participants were briefed prior to each immersive simulation. Mannequins were used if clinical signs were expected to be identified on examination. Verbal and written feedback was given after each simulation. *Evaluation.* Pre and post simulation questionnaires were developed. Increase in confidence and competence were reported in all areas pertaining to application of consultation and clinical skills. Qualitative comments from the participants regarding the training course were also favourable with respondents highlighting the value of the training, especially in terms of developing confidence via the real-time feedback. *Conclusion.* This innovative simulation evaluated as being of value to GPCPs in developing clinical confidence and competence when dealing with a variety of typical General Practice scenarios. Plans are underway to establish a Scottish Pharmacy Simulation Faculty which could support this training in each health board.

Keywords Clinical pharmacy · Education and Training · General Practice · Simulation

Facilitators of best practice

- Faculty—suitably trained staff with experience of simulation teaching techniques, including how to deliver feedback, is essential.
- Faculty—suitable clinical experience of facilitators is thought to enhance the learning experience for participants.
- Clear aims of clinical practice set out within a nationally approved Advanced Practice Framework

Barriers to best practice

- Funding—clinical simulation teaching of this sort is relatively expensive.
- Service infrastructure in terms of a simulation suite is required
- Travel—this course was run in the largest Scottish city but the Faculty to deliver it came from some of the most remote parts of the Highlands & Islands. A strategy to develop local expertise to deliver courses locally is being developed.

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Background

In 2013, the Scottish Government put into policy the need for clinically-focused pharmacists working in primary care [1]. Subsequent Government strategy [2] and funding [3] has further supported the roll out of General Practice Clinical Pharmacists (GPCPs) into every General Practice in Scotland. The general duties of GPCPs and the wider pharmacy team are set out in the *Pharmacotherapy Service* section of the General Medical Services contract for primary care [3] where the *Service* is comprised of three general roles: (1) medicines reconciliation, acute and repeat medicines systems and prescribing; (2) medication review and optimisation; and (3) polypharmacy clinics based on National Polypharmacy Guidance [4] and other specialist clinics (e.g. chronic pain, heart failure etc.). However, a 2018 national evaluation of pharmacy teams working within GP practices within Scotland showed that while 69.7% (n = 274) of GPCPs were independent prescribers, only 58.8% (n = 231) of GPCPs engaged in patient-facing service delivery [5].

To enable pharmacists to undertake this work safely, a commitment was made by the Scottish Government that GPCPs should be credentialed. This work has been undertaken by NHS Education for Scotland (NES) Pharmacy, who commissioned a multidisciplinary team to develop an Advanced Framework [6] which is mapped to the Royal Pharmaceutical Society's Advanced Practice Framework [7]. The Framework has been supported by the Royal Pharmaceutical Society and Royal College of General Practitioners in Scotland [8]. GPCPs in Scotland use it to support their learning and development in practice, primarily through gathering of evidence in the form of supervised learning events including: mini-clinical examination (MiniCEX), case-based discussion, clinical examination & procedural skills, patient satisfaction questionnaire, team assessment of behaviour and a clinical skills log.

There has been a significant change in expectation around autonomous clinical practice placed on pharmacists since the inception of the GPCP role. Due to the nature of how care is delivered in general practice (principally a patient- to-clinician consultation model) there is a need for GPCPs to work in a predominantly autonomous manner. It would be inefficient, for example, if GPCPs were unable to manage patients independently, requiring either to seek GP advice during the consultation to inform the management plan, or to refer the patient to a subsequent GP appointment—resulting in inconvenience for patients and increased workload for GPs. To autonomously manage patients safely has required GPCPs-in-training to develop a new augmented skill set incorporating greater clinical assessment skills than their predecessors. These skills include more advanced clinical consultation, history taking, procedural and examination skills. In addition to the technical ability to conduct these tasks there is the need for GPCPs to apply critical evaluation skills in the context of the presentation or clinical situation. They are required to make informed clinical decisions, taking into account the patient's ideas, concerns and expectations, while balancing these with clinical risk and uncertainty. The breadth of complexity a GPCP can independently manage by expertly exhibiting such skills and behaviours, whilst autonomously applying their clinical therapeutic knowledge, will largely determine how advanced their practice is.

Meeting this demand in a rapidly changing and advancing clinical field becomes a challenge for educators. The traditional way of teaching and training pharmacists is by predominantly knowledge-based academic and theoretical coursework submissions, supported by direct observation of clinical practice by way of a portfolio. This will not necessarily be enough to ensure GPCPs have the skills, knowledge and behaviours required to meet this new expectation. Increasing time in clinical practice may increase the likelihood of exposure to clinical scenarios, but it does not guarantee it. Innovative means of meeting the educational requirements of GPCPs need to be explored to meet the breadth of clinical complexity which GPCPs are expected to manage within the clinical environment which the GPCP is required to practise in.

Simulation has been used extensively in medical teaching to provide a safe learning environment for doctors-in-training to refine their skill set in the management of patients. There is a spectrum of sophistication employed in the delivery of simulation educational experiences—these can range from synthetic body parts to complex clinical human factor interactions involving simulated patients (actors) in simulated environments [9]. Critical to the effectiveness of the training is the establishment of fidelity, which is the term used to describe the similarity of the simulated procedure/ interaction with the real-life comparator. Simulation has been shown to be effective in delivering learning outcomes for complex interactions across a wide variety of clinical and care settings [10].

Simulation has been used in clinical pharmacy teaching before and is thought to complement taught material from the undergraduate curricula [11, 12]. It has been found to be useful in teaching specific clinical scenarios to pharmacy students including drug-induced dyspepsia [13] and critical care [14]. A recent scoping review of simulation-based skills assessment for pharmacists found a limited evidence of use of simulation in this regard and noted an underutilisation of the potential of simulation in pharmacy education [15]. Furthermore, Lloyd et al. [16] in their excellent paper covering simulation-based training applications in clinical pharmacy, found the evidence supporting simulation in pharmacy training is lacking. More research is needed to ascertain the place of simulation training of pharmacists at advanced level, as well as in evolving GP clinical roles.

Aim

To design and deliver an innovative simulation course to support the development of advanced GPCPs in clinical assessment and management of patients in General Practice.

Development

The learning objectives for the course were developed by the Highland Pharmacy Education & Research Centre (HPERC) team. These included: (1) develop confidence and demonstrate competence in clinical assessment, management, prescribing and consultation skills over a range of common clinical encounters within General Practice including; long- term conditions, acute presentations, polypharmacy and multimorbidity, acute-on-chronic presentations, interpreting blood tests and medicines reconciliation; (2) show how supervised learning events can be used effectively to support GPCP development through the NES GPCP Advanced Framework.

The HPERC Faculty designed the clinical simulations in advance to meet these learning objectives. These were written in a standard format using a case scenario proforma which included: information for pharmacist participants (scenario synopsis, past medical history, medication, or other relevant details); information for simulated patients (scenario synopsis, opening line, ideas concerns & expectations; behaviour; specific responses if asked; any specific clothing or props; moulage); clinical information for facilitators and simulated patients (given as a standard full clinical history); facilitator's guide for assessment (expectation of pharmacist assessment; expectation of investigation plan; management plan; consultation & interaction with patient). Each scenario was mapped to the NES GPCP Advanced Framework such that the composite of all clinical scenarios was designed to cover as many different presentations and competencies as possible. MiniCEX from the NES GPCP Advanced Framework were used to give written feedback to the participant on their performance after the event. All members of the HPERC Faculty have portfolio posts which include clinical, as well as education & training components which were critical to attaining fidelity of the scenario to real practice.

Scenarios were based on typical General Practice type presentations/consultations that are covered under the auspices of the NES GPCP Advanced Framework. Scenarios included: new presentation of atrial fibrillation (see supplementary material); asthma review; frailty in a nursing home patient and ceiling of care towards end of life discussions; medication review within a GP practice; acute asthma exacerbation; symptomatic uncontrolled diabetes; chronic pain review; care home medication review; polypharmacy and the frail elderly; and cardiovascular risk management in type 2 diabetes.

Invitations were sent out by NES to all GPCPs registered on the national training pathway and recruitment to the course was completed via an online booking portal. NES staff and HPERC Faculty collaborated extensively prior to the event to ensure the appropriate equipment and room set up was available on the day. Standard medical equipment including; sphygmomanometer, thermometer, pulse oximeter and stethoscopes were available at all stations. In two stations, where the scenario determined a need for cardiorespiratory examination, the SimMan® mannequin was used to maintain fidelity of the simulation. This mannequin can generate specific examination signs—such as wheeze chest sounds for pulmonary auscultation in the acute asthma simulation, and an irregularly irregular pulse and heart sounds in the atrial fibrillation simulation.

The corresponding author (GR) led the course and undertook the briefing and de-briefing sessions. Simulated patients were used to role play at each station based on the clinical case scenarios which were developed by the HPERC Faculty. All scenarios were tested for face validity with a team of experienced clinical pharmacists and educationalists prior to running the training. Each scenario was designed on a proforma to ensure consistency between different simulations. It had been planned to recruit simulated patients from volunteer members of the public, but due to the COVID restrictions locally, this was not possible, so members of NES and HPERC Faculty were required to undertake this role. In addition to having a simulated patient at each station, there was also a facilitator from HPERC Faculty present. They observed the consultation and provided a micro-debrief at the end of the consultation. During the live simulation, the GPCP could request the facilitator to play the role of a Clinical Supervisor, i.e. a more senior colleague, to provide assistance based on the clinical instructions outlined in the case scenario proforma.

Written feedback in the form of a MiniCEX from the NES GPCP Advanced Framework was offered to each participant. Participants were encouraged to submit an electronic feedback request to the facilitator from each station. All HPERC Faculty have completed an online NES training course on how to deliver feedback in the form of a MiniCEX.

The course was split into a morning and afternoon session, with five stations per session. Ten GPCPs participated in the course. On arrival, participants were given a presentation which included an overview of the day, an orientation to the simulation suite and equipment available to them—this included an overview of the equipment at each station and how to examine SimMan®. It also explained that at each station there would be a person playing a simulated patient and that the GPCP was expected to communicate with the simulated patient as if they were a real patient. It was explained that the simulated

patient may be examined after consent was gained. Clinical protocols and additional information were available, and GPCPs were informed that this could be requested from the facilitator during the simulation.

The group was divided into pairs, with each pair rotating through the five stations during each session. One was to take the lead at each station, alternating between each station, such that by the end of the course, each GPCP had experience of leading on five consultations. The GPCP not leading at each station would observe the lead GPCP undertaking the consultation and were asked to observe and reflect on the behaviours they observed, and consider how these differed from their own perceived skill set. The GPCP was given a clinical scenario synopsis to read at the start of the simulation. Each simulation lasted 20 min—at the end of this the GPCP leading the simulation gave the facilitator a handover including an overview of the clinical scenario, their assessment and management plan. There was opportunity to debrief on the clinical scenario before the groups rotated and the non-lead GPCP from the current station then became the lead GPCP at the next station. GR then conducted a meta-debrief at that end of the morning and afternoon sessions pulling out general themes on what went well for the participants and what were some of the common challenges. These were then explored in more detail before pulling out take home messages.

Implementation

The simulation took place at the National Skills Education Hub, Louisa Jordan National Hospital, Glasgow, in November 2020. The training Faculty was comprised of pharmacists from across HPERC including various locations in the Highlands and Islands of Scotland as well as teaching staff from NES in Glasgow. In total, six HPERC Faculty and three NES staff attended. Again, due to restrictions at that time, we were unable to use simulated patients as hoped to run the event. We were therefore reliant on Faculty role playing the simulations and for two stations, Faculty members were required to play the part of the patient as well as the facilitator.

Evaluation

Method

Pre and post course questionnaires were developed by the HPERC and NES teams. The training was evaluated broadly based on levels 1 and 2 of The Kirkpatrick Model, [17] where level 1 describes the degree to which participants find the training engaging and relevant, and level 2 describes the degree to which participants acquire the intended knowledge and confidence based on their participation in the training.

Questionnaires were designed to capture quantitative and qualitative data on using simulation as a training intervention and measuring perception of confidence and competence in consultation, decision making and clinical skills pre and post training.

Results

Ten participants (100%) completed the pre course questionnaire and seven (70%) completed the post course questionnaire. Three participants were lost to follow up despite repeated invites to complete the post course questionnaire.

Figures 1 and 2 show that, of the 30 questions relating to self-rated confidence and competence for clinical, consultation and decision-making skills, there was an improvement in the scores for 28 questions and the final two questions were neutral.

All participants reported they would be able to use the course attendance as evidence for their NES GPCP Advanced Framework portfolio.

Figure 3 shows that despite > 40% of participants never having experienced simulation before, that simulation was perceived as a useful training intervention with all the participants strongly agreeing that they would like to participate in further simulation. Participants also strongly agreed with the statement that simulation increased confidence and competence in clinical practice.

There was favourable qualitative feedback as evidenced below:

- Each simulation was in a different clinical area and, while I felt quite anxious about this initially, as they were not all conditions I would have said I felt confident prescribing in, it was actually fantastic. I think it made us all realise that we know more than we think about most clinical areas and that is a real confidence boost. Having access to a clinical supervisor also helped with this as you recognised the remit of your own knowledge. I've reflected a lot on the training day and I really feel it is one of, if not the, most valuable training [courses] I have been on to date. The environment was very

supportive. I will definitely feel more confident branching out into other clinical areas than I would have in the past. [Participant 1: *how to utilise a clinical supervisor to push the scope of clinical practice*].

- Having a safe environment to practice consultation and clinical assessment skills was highly valuable. Being given direct in-the-moment feedback was beneficial as it allowed for reflection of your consultation while fresh and identified further consultation skills and learnings relating to your recent consultation. [Participant 3: *benefit of a simulation environment to practice advanced skills*].
- I feel if something like this was completed early in Pharmacist's journey through the framework it would provide them with confidence and take away some of the fears of the unknown. [Participant 5: *benefit of simulation in development of clinical confidence*].

Discussion

Pre-simulation confidence and competence in clinical practice was high among participants – this is expected in an advanced GPCP cohort. However, despite the potential for a ceiling effect, there was still a clear increase in participants' self-reported post-simulation confidence and competence across a range of consultation and clinical skills. In particular, there was a positive shift in the confidence of GPCPs to make autonomous prescribing decisions across a range of General Practice presentations. The clinical supervisor was seen as a facilitator to GPCPs developing their confidence and stretching their decision-making. These were the key learning objectives of the course. In general, there was also strong agreement as to the benefit of simulation where all respondents expressed a strong desire to have future simulation experiences.

Advanced pharmacist practice is changing: there is growing expectation that the role of the clinical pharmacist now include the autonomous assessment, investigation, diagnosis and management (including prescribing) for complex patients [18]. There is a need to adapt clinical pharmacist training – from undergraduate through advanced pharmacist programmes- to encompass more simulation and preceptored experiential learning in practice (i.e. utilising effective clinical supervision) to stretch the confidence, and ensure the competence, of the next generation of advanced pharmacists [19]. A recent survey by the International Pharmaceutical Federation (FIP) comprising 48 countries reported that frameworks supporting advanced practice are currently available, or are in development, in 28 countries worldwide [20]. The development of effective pharmacy simulation should be seen as essential to the effective and safe development of advanced pharmacist practice globally.

Simulation of this type consumes a lot of Faculty time before, during and after the course to ensure the content is appropriate to meet the aims and learning objectives and that the course itself runs smoothly [16]. While funding is a prerequisite for any new education and training activity, there needs to be recognition from service and education and training providers of the increased costs associated with this type of activity as a result of the Faculty required to run the event. Also, specialist units and clinical skills centres (while not necessarily essential for these types of scenarios) are well placed, through experience, to run these types of sessions; however, access to these types of units normally comes at a higher cost.

HPERC developed a Faculty of local clinical educators and worked with the national education provider, NES, to deliver this event. It is essential that any future roll out of this type of event look to develop that Faculty and link with NES.

Simulation as a teaching and training tool is discernibly different from a simulated assessment—i.e. an Observed Structured Clinical Examination. There is a need to draw this distinction among the pharmacist workforce in Scotland to ensure that participation on a course such as this is seen by participants as being about their own individual learning, rather than assessment.

Evaluation of a new training system should start with Level 1—reaction analysis—using the Kirkpatrick model. This should be developed over time after securing additional staffing and funding resources to explore more in-depth evaluation on the impact of the learning (Level 2) then the impact on behaviour change for the individual (Level 3) and ultimately looking at the impact of the outcomes of the composite of the change (Level 4) [17]. HPERC have been successful in a bid for a clinical academic to be recruited to undertake some of this work to develop and further evaluate the simulation programme. A change will be made to the simulation programme for future iterations such that completion of the post-assessment would become a compulsory requirement for successful completion of the course.

HPERC and NES are currently working with other pharmacy clinical educators from across Scotland, as well as the Scottish Centre for Simulation & Clinical Human Factors to develop a Scottish Pharmacy Simulation Faculty (SPSF). The hope is to bring together a group of individuals from across the country with the knowledge, skills and experience to roll out validated pharmacy simulations across the country. As a prerequisite to joining the SPSF, each educator will be offered either a one-day or two-day training course to upskill them in the design and delivery of a simulation course, particularly in the skills surrounding the debrief model.

As part of the development of the SPSF, there is a need to consider how to train pharmacists in the various different sectors, as well as levels, of practice—from student pharmacists on placement, through pre-registration and newly qualified, to advanced pharmacists. Beyond this, the authors think it essential to look to develop novel and innovative interprofessional learning simulations utilising the wider multidisciplinary team. There is a need to develop the educator team within the SPSF to ensure that all the sectors are represented and also consider the geographical spread of representation across Scotland. In part, some of this will be achieved by adoption of a simulation course, such as this, for national roll out by the SPSF. Ongoing funding is required to ensure continuity of service but what has become apparent is the need for such a Faculty to exist to take forward, in a considered and collaborative manner, simulation training for the pharmacy profession in Scotland.

Conclusion

This innovative simulation evaluated as being of value to GPCPs in developing clinical confidence and competence when dealing with a variety of typical general practice scenarios. It supported the development of advanced GPCPs in clinical assessment and management of patients in general practice and in doing so met the aim and learning objectives of this course. This course has since been recommissioned and a funding for a clinical academic pharmacist has been secured to undertake more extensive evaluation of the impact of simulation in advanced pharmacist training.

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Availability of data and material All data and materials are available from the corresponding author upon reasonable request.

Conflicts of interests None.

Ethical approval Was not required as no patient data were used in this publication.

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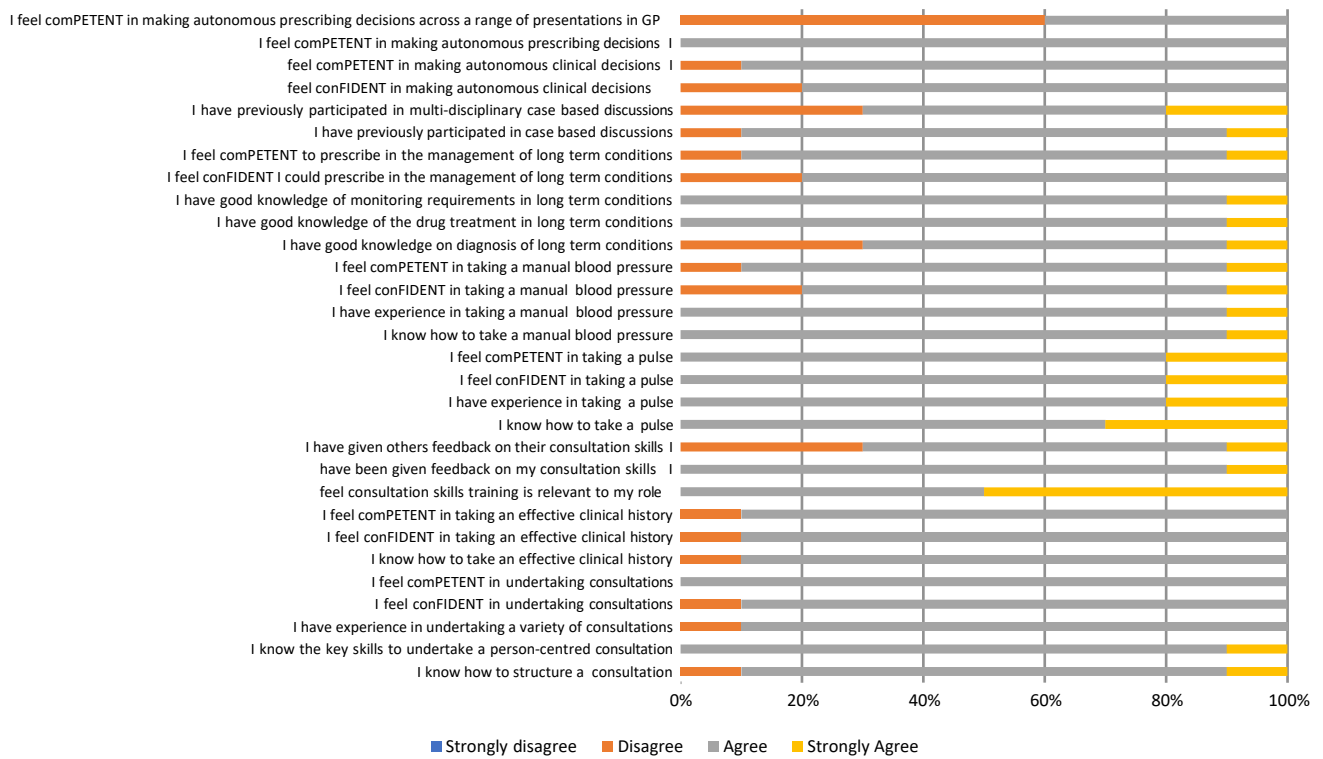


Fig. 1 Pre-simulation clinical, consultation and decision-making skills questionnaire results (n = 10)

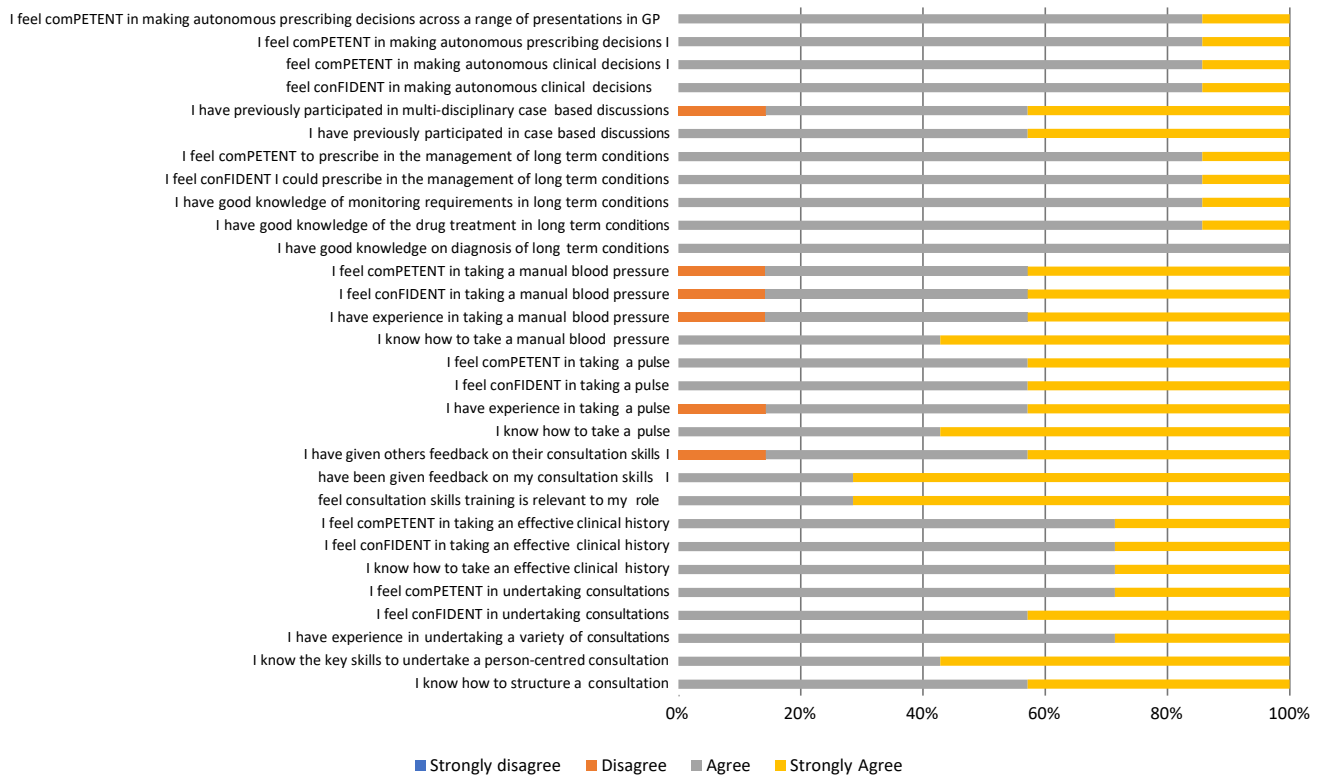


Fig. 2 Post-simulation clinical, consultation and decision-making skills questionnaire results (n = 7)

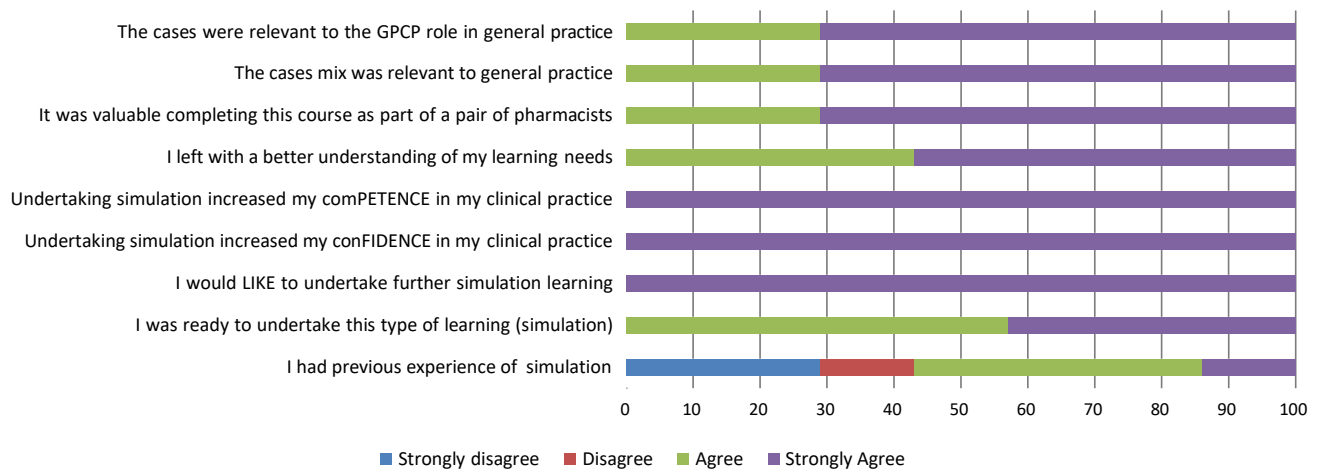


Fig. 3 Experience of simulation (n = 7)