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# Virtual patient educational intervention for the development of shared decision-making skills: a pilot study

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## ABSTRACT

**Background** Shared decision-making (SDM) involves a healthcare professional and a patient forming a congruent partnership, within which information is shared and decisions are made which align with the patient's values. SDM does not occur to the extent it ought to; SDM requires practice. Virtual reality could help facilitate this practice.

**Objective** To pilot an interactive, high-fidelity virtual patient (VP) who simulates SDM within a primary care consultation.

**Method** Academic pharmacists and doctors were recruited from the Keele University. Participants completed prequestionnaires and postquestionnaires.

**Results** 18 participants (14 pharmacists and 4 medical doctors) completed the study. 89% (n=16) suggested the VP was 'enjoyable' or 'highly enjoyable' to use and 72% (n=13) suggested it was 'very accessible'. There were diverse views about the way in which the user made their reply to the VP with ratings ranging from 'very poor' (n=2) to 'very good' (n=5); the modal rating was indifference (n=7). It seemed the multiple choice system caused the participants to feel restricted but it was unclear why those who liked the system did so.

**Conclusions** The VP was found to be enjoyable and thought-provoking. The data suggest that this type of intervention could be useful at many different stages of a professional's career although the multiple-choice conversation style may be too restrictive for more experienced consultants.

## INTRODUCTION

Shared decision-making (SDM) involves a healthcare professional and a patient forming a congruent partnership, within which information is shared and decisions are made which align with the patient's values.<sup>1</sup> In 2000, Bensing described SDM as combing 'two worlds' of information, the patient's and the clinician's<sup>2</sup>; Coulter and Collins discuss 'two sources of expertise'.<sup>3</sup> The central point in both of these explanations is a balance, bringing the technically focused knowledge of the clinician, including pathology, pharmacology and statistics, and combing this equitably with the patient's knowledge of their values, their experience of the condition and their social circumstances.

As combining these two sources is not simple, it is perhaps not entirely surprising that SDM is not happening in practice as much as it perhaps ought to.<sup>4,5</sup> In the UK national inpatient survey conducted by the Care Quality Commission, 22% of the

74 523 respondents said that the doctors looking after them either 'often' or 'sometimes' spoke in front of them as though they were not there; 10% of patients (n=74 55) said they were not involved in decisions about their care.<sup>6</sup>

As with any skill, SDM requires practice and feedback to improve.<sup>7,8</sup> Virtual patients (VPs) are a 'specific type of computer program that simulates real-life clinical scenarios; learners emulate the roles of healthcare providers to obtain a history, conduct a physical examination and make diagnostic and therapeutic decisions'.<sup>9</sup> VPs are tailorable to the learning outcomes, the level of the learner, standardised and accessible at any time via a range of multimedia devices. Historically, the majority of VP cases have not focused on SDM, focusing either on the technical aspects of care<sup>10</sup> or patient-centred counselling.<sup>11</sup> In real practice clinicians are required to do both; it is not acceptable to be kind and caring but clinically incompetent and vice versa. We therefore designed a VP that allows the user to practice SDM, drawing on their technical skills as well as their ability to have a patient-centred conversation.

## OBJECTIVES

There were two objectives for this pilot study.

1. To explore academic pharmacy and medical professionals' views of the SDM VP.
2. To trial the evaluative methods to ensure they functioned reliably.

## METHODS

### Population

Members of academic staff who have a background in clinical practice were approached via email. These academics had to be based in either the School of Pharmacy or School of Medicine at Keele University, UK and come from a clinical background, although they did not have to be currently practising clinicians.

### Intervention

The intervention was a high-fidelity animation of a patient exhibiting body language and audio response. The interaction was multiple-choice as can be seen in [figure 1](#) or the link in the reference list.<sup>12</sup> It was accessible via a web link. The VP gave autonomous feedback, with 'Brian', the VP, giving his opinion first followed by text-based 'technical' feedback. The design and development of the VP are described in the literature.<sup>13</sup>



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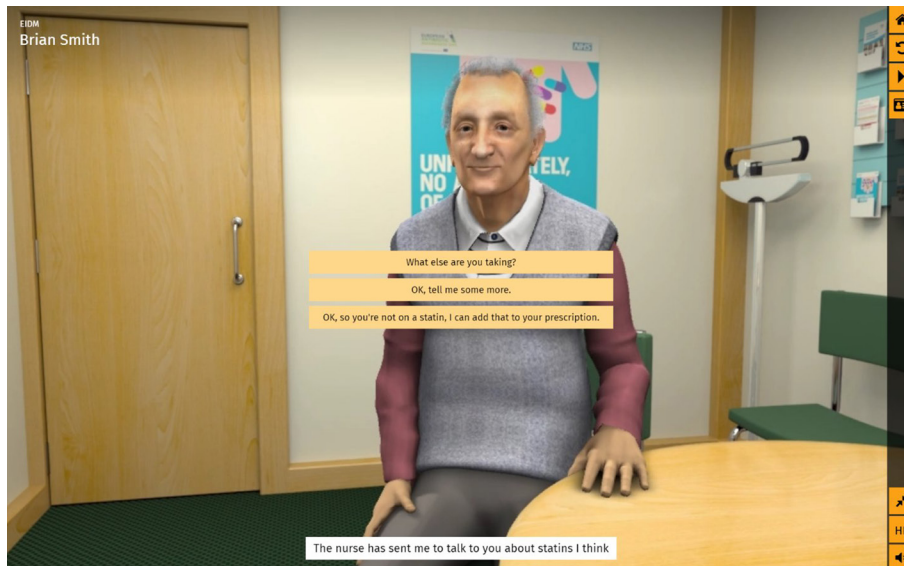


Figure 1 Screenshot of the intervention.

### Evaluative measure

All participants had to complete an online consent form then a prequestionnaire (see the online supplementary file 1). They then accessed the VP via weblink then completed a postquestionnaire (see the online supplementary file 2); all questionnaires used Google Forms. After this, the evaluation was complete. If a participant dropped out from the study, all of their data were removed.

Analysis of quantitative data was descriptive in nature. Some of the multiple-choice questions had free-text follow-up questions; these were also analysed descriptively, grouping responses together and using quotes to illustrate the views expressed.

There were no significant ethical issues as the simulation was not likely to be emotive or upsetting. Ethical approval was granted by Keele University.

### RESULTS

The total number of participants who enrolled in the pilot study was 21; 18 completed the final evaluation. There were 6 men and 12 women; 14 were from the School of Pharmacy and 4 from the School of Medicine.

Sixteen participants rated the VP as either 'enjoyable' or 'very enjoyable'.

Thirteen participants rated the VP as 'very accessible' and 1 rated it as 'accessible'. This was echoed in the free-text responses.

There was a range of views expressed about the way in which the user could reply or respond to the VP, the format of reply (see figure 2). Fifteen participants responded to the accompanying free-text question with most suggesting that the multiple-choice system was too restrictive (n=12).

'Sometimes limiting because of the multiple choice answers'. (Participant 11)

'The suggestions in the drop-down menu were not what I would have said so I felt constrained'. (Participant 20)

Two participants commented that the system truncated the available options and thus made them difficult to read. It is not completely clear why the participants who liked the multiple-choice did so. One participant suggested it was easy to use.

'Easy to use on multiple devices for example, using a mouse or touch input'. (Participant 10)

As table 1 shows, the VP was rated as most useful for consultation skills and patient-centred care with seven and eight participants rating the VP as 'very useful' for both of those areas, respectively.

There was a fifty-fifty split among the participants with half suggesting it was likely there would be changes in their practice and half suggesting that it was unlikely. The suggested changes were typically concerned with being more patient-centred.

'What the avatar made me think more about is patient-centred care. Sometimes I can forget about patients' preferences, which might be troublesome to some (patients). The avatar prompted this in a very good way'. (Participant 7)

### DISCUSSION

While receiving some positive feedback, the VP was also quite polarising as well. A key area of dissonance between participants was the form of the reply to the patient. Figure 2 shows quite a spread in participant opinion and the accompanying comments also highlight this. A key feature of these technologies is how the reply is made by the user that is free text or multiple choice. Free text can be incredibly difficult to design, especially for a broad, open conversation, as in SDM, where replies build on one another. Balanced against this are potential issues with the 'rigidity' of multiple choice formats. Future remedies to this

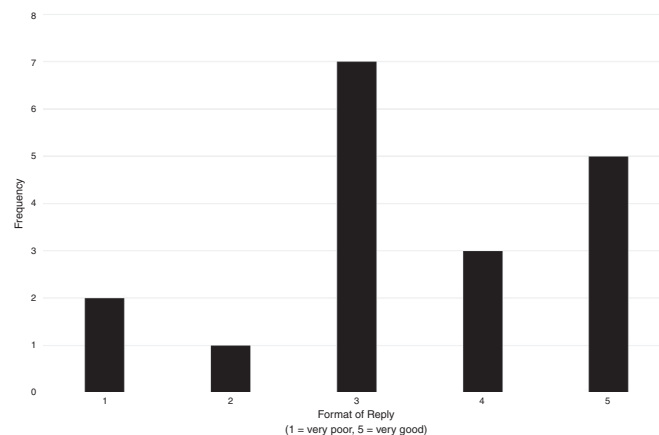


Figure 2 Format of reply.

**Table 1** How useful was the VP in teaching the following? (n=18)

	Frequency (1=not useful at all, 5=very useful)		
	Not Useful	Neutral	Useful
Consultation skills	3	3	12
Clinical decision-making	3	8	7
Patient-centred care	1	3	14
Communication skills	6	2	10
Managing medical complexity	6	3	9
Managing polypharmacy	7	4	7

VP, virtual patient.

could include more options being available (eg, five rather than three in the relevant places) and refinement of the design and options presented. One thing that did not come across clearly, perhaps due to the simple questionnaire evaluation, was why those who rated the reply system highly did so (ie, what was it about the multiple-choice style that was good?). Did the multiple-choice system allow the participants to see or reflect on the different options available, some they had not thought of previously? With future work planned, including interviews with other users, this topic will be explored in more depth.

Previous research has found these types of technology to be well accepted by the users and able to evoke emotional effects in medical students, but still with a feeling of prefabrication and a desire for exposure to real patients.<sup>14</sup> This could be linked to the notion of the 'theory-practice gap', the bridging of which is postulated to be helped by virtual reality.<sup>15</sup> This may be why some of the participants, experienced clinicians, found this intervention less useful? It could be possible that the theory-practice gap was not as relevant for the pilot participants as for undergraduates as the participants were more experienced clinicians, able to put theory into practice already.

## CONCLUSION

The VP was found to be immersive and thought-provoking by the participants of the pilot. The data suggest that this type of intervention could be useful at many different stages of a professional's career although the multiple-choice conversation style may be too restrictive for more experienced consultants.

Much of the conclusions are tentative due to a small sample and pilot nature of the study. The next phase includes work with larger groups and different levels of professional. While providing some initial insights into the tool, this pilot study also allowed the fine tuning of the evaluation for the subsequent stages.

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**Contributors** SJ, NM and SC designed the study. SJ managed the data collection. SJ, NM and SC were involved in the data analysis. SJ wrote the first draft. SJ, NM

and SC wrote the final version of the paper. SJ, NM and SC are all equal contributing authors. All authors reviewed the manuscript, added appropriate revisions, agreed to submission for publication, and approved the final version. The corresponding authors attest that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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**Disclaimer** Brian Smith is not an actual patient. Any resemblance to a real person living or deceased is coincidence.

**Competing interests** The VP described in this paper is not licensed for commercial sale; none of the authors will therefore receive any monetary gain from the tool. SC is one of two patent holders for the technology. Keele University School of Pharmacy makes virtual patient products similar to the one described in this paper for a range of external commercial clients. NM is a former Programme Director of the Medicines and Prescribing Centre at NICE and a current member of the NICE Shared Decision-Making Collaborative. SJ's PhD is funded by a joint collaboration between NICE and Keele University. NICE had no input or control over the design of the virtual patient or the writing of this paper.

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