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People, Partnerships and Pedagogies

Empathic communication training in healthcare using Virtual Patients

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This project aims to build effective empathic communication training for healthcare students using conversational AI and Virtual Patients. An umbrella review of empathy training in healthcare will be used to create a framework for designing effective empathy training. We will investigate two different implementations of Virtual Patients through a pilot study with speech-language therapy students from the University of Auckland. We will engage students, educators and patients in the experimental studies, following co-design and design-based research methodology.

Keywords: Virtual Patients, communication skills training, empathic communication, conversational AI, natural language processing, co-design

Introduction

Many definitions of empathy and compassion in healthcare exist in the literature. Sinclair et al. (2017) defined empathy and compassion as attempting to understand another person's suffering. According to Mercer and Reynolds, the following are essential components of empathic care: 1) understanding the patient's perspective, feelings and situation, 2) confirming understanding with the patient, and 3) acting on that understanding in order to help the patient (Mercer & Reynolds, 2002). Even though conceptual differences exist between empathy and compassion in healthcare, they refer to the same key elements: understanding the patient's perspective and acting to relieve the patient's suffering. A related term of person-centred care (or patient-centred care) includes therapeutic empathy but has a broader scope that also encompasses continuity, teamwork, coordination of care, equity in access and patient empowerment (American Geriatrics Society Expert Panel on Person-Centered Care, 2016; Hardman & Howick, 2019). Respect, individualised treatment, care that addresses both physical and emotional needs, sharing knowledge with the patient and honest communication (Kitson et al., 2013) are common themes between therapeutic empathy and patient-centred care.

Evidence exists that empathy, compassion and person-centred communication in healthcare have a positive influence on both patients and healthcare providers (Trzeciak et al., 2019). Recent reviews of this form of care point to a number of benefits for patients: improved patient outcomes (Howick et al., 2018, Watts et al., 2023), improved well-being, reduction in measures of depression, anxiety and psychological distress (Kirby et al., 2017), reduction in pain and improved satisfaction (Howick et al., 2018). For providers, a reduction in burnout has been reported (Watts et al., 2023). The World Health Organization has recognised the benefits of person-centred care in their recommendation to encourage such care internationally (World Health Organization, 2007).

The main focus of research into empathy training in healthcare over the last two decades has been to determine what types of interventions are effective and what contributes to their effectiveness. A multitude of reviews have been published recently. However, with so many approaches with different student groups and outcome measures, it is difficult for the educator to know how to plan their empathy training best. There is a need to summarise the evidence base and develop a comprehensive framework for designing empathic communication training for healthcare educators. This will be achieved through an umbrella review (a systematic review of reviews), following the Joanna Briggs Institute methodology for umbrella reviews (Aromataris et al., 2020). We will answer the following research questions through this review:

1. What are effective interventions to enhance empathy, compassion or person-centred communication in healthcare students and professionals?
2. How is the effectiveness of interventions measured?
3. What mechanisms contribute to the effectiveness of interventions?

Having determined the necessary elements of effective empathic communication training, we will design the training in collaboration with students, educators and patients. We have chosen to implement the training using Virtual Patients as this modality offers unlimited opportunities to practise in a low-stakes, safe learning

environment and the convenience of training off-site, anytime. Virtual patients (VPs) are an interactive computer simulation of clinical cases for healthcare education. They have a well-established use in teaching clinical interviewing, taking medical history and diagnostics (Cendan & Lok, 2012). A recent review of VPs in medical education found them to be as effective as traditional methods in developing knowledge and more effective than traditional methods in developing skills related to clinical reasoning and procedural skills (Kononowicz et al., 2019). Recently researchers and educators have been investigating the use of VPs for communication skills training, including more nuanced topics such as empathic communication, breaking bad news, and shared decision-making. For these purposes, realistic interactions with VPs and emotional engagement are essential. According to a study involving medical students interviewing both VPs and actors trained to play the role of patients (Standardised Patients, SP), the students showed more empathy towards VPs than SPs, demonstrating the potential for VPs in training empathy (Kleinsmith et al., 2015). Another study found that, although medical students engaged with behaviours and responses demonstrating empathy with VPs, the frequency of this type of engagement was higher with SPs (Deladisma et al., 2007). These results indicate a need to study and develop VP scenarios which maximise engagement and socially realistic interactions.

Evidence exists that training with VPs can result in improvements in empathic communication. In a recent systematic review of medical communication training involving VPs, half of included studies which measured improvements in students' attitudes or skills noted positive results (Lee et al., 2020). Bowyer et al. (2010) observed an improvement in empathy skills when the practice of breaking bad news was offered using a mixed reality simulation. A recent study of speech pathology students interviewing VPs found that students mainly focused on diagnostics and avoided personal and social topics relevant to the case scenarios (Miles et al., 2020) and are part of a person-centred consultation. Covering personal and emotional aspects in patient interviews is an area that future training should help develop.

Jacklin et al. involved patients and experts in designing VP training to practise clinical reasoning and patient-centred consultation style, including shared decision-making (2018). Through the collaboration, the researchers noted the need to improve the delivery of feedback to students as part of the training. The tool was effective in changing medical students' attitudes regarding the value of patient focus and shared decision-making (Jacklin et al., 2021). Foster et al. (2016) showed the importance of feedback on students' empathic responses in interactions with VPs. A recent scoping review of the use of VPs in communication skills training also emphasised the importance of delivering feedback and providing multiple practice opportunities to realise the full potential of this training modality (Kelly et al., 2022). A previously mentioned systematic review of medical communication training using VPs found human feedback, but not system-generated feedback, effective in the included studies (Lee et al., 2020). Further work is needed to build empathic communication training capable of providing effective personalised feedback to students. VPs offer a safe, repeatable environment for learning that is difficult to achieve in clinical practicum and deserve research attention. Recent advances in natural language processing and language generation using large language models allow using AI-powered VPs for more nuanced topics, such as empathic communication.

This project aims to build effective empathic communication skills training capable of delivering accurate automated personalised feedback. We will collect qualitative and quantitative data related to participant attitudes, knowledge and skills before and after training to determine the effectiveness of our training methods. We will use co-design and design-based research methods (Amiel & Reeves, 2008; Wolcott et al., 2019). We will involve students, educators and patients in the design and testing of training. We aim to iterate over the design and testing, hoping that our findings during this process will be useful for other researchers and will be able to improve educational practices.

Studies

The project supervisors, Dr Anna Miles (Speech Science, University of Auckland) and Professor Benjamin Lok (Director of the Virtual Experiences Research Group, University of Florida), have collaborated for many years. Speech-language therapy students from The University of Auckland interview VPs each year, and many publications have come from this collaboration (Miles et al., 2020, Halan et al., 2018, Carnell et al., 2022b, Carnell et al., 2022a). The project aims to expand on this early work and build sophisticated empathic communication training for healthcare students through computer science and healthcare educator alliances. My doctoral thesis will consist of the following work:

A literature review of empathy in healthcare: definition and measurement

This literature review covers definitions of empathy, compassion and person-centred care; the benefits of empathy in healthcare; patients' and their families expectations from their health professionals; barriers and enablers of empathy; measuring empathy in healthcare, and how this concept fits into the broader framework of healthcare quality.

The current state of empathy, compassion and person-centred communication training in healthcare: an umbrella review

This umbrella review follows the Joanna Briggs Institute methodology (Aromataris et al., 2020) and consolidates evidence available on empathy, compassion and person-centred communication training in healthcare, the effectiveness of training and design mechanisms that contribute to effectiveness. Twenty-five reviews were included in the umbrella review. Most reviews described results at the level of participant learning (impact on knowledge, skills, attitudes and confidence), seven reported on participant behaviour and seven on patient experience and outcomes. We provide a summary of the definitions of empathy, compassion and person-centred communication and training outcome measures used by the reviews. We synthesise findings related to the mechanisms and effectiveness of training and provide a summary of review recommendations.

For policy and practice, we advise the inclusion of empathic communication into the curriculum; longitudinal and sequenced learning; use of adult learning and behaviour change principles to target attitudes, knowledge, skills and behaviour of participants through:

- debriefing, targeted feedback, enabling self-reflection, deliberate practice, experiential learning
- improving motivation by teaching the benefits of empathy and person-centredness
- teaching sustainable empathy.

Future research should focus on longitudinal studies capturing participant attitudes, knowledge, individual circumstances, context, and impact on participant behaviour and patient experience and outcomes; involve patients in training and research; study the effect of targeting interventions at both healthcare practitioners and patients; and define consensus empathic communication competences.

Empathic communication training design and methods for its evaluation

This work aims to put into practice the learnings from earlier reviews and develop a framework for designing effective simulation interventions for teaching empathic communication. Motivation will be given for the choice of simulation with VPs as a training method and methods for its evaluation. Two different implementations of VPs will be investigated and the details of the technical design will be discussed. We will use adult learning, educational and behaviour change principles to ensure effectiveness and provide individualised feedback to enable progress through self-reflection. We will improve motivation to engage in empathic communication by teaching the benefits of empathy and person-centredness in healthcare and how to practise sustainable empathy.

Experimental study of empathic communication training using Virtual Patients

The umbrella review of empathy training in healthcare completed earlier this year emphasised a need to include trainees and patients in the training design. This study intends to use feedback from students, educators and patients to improve the training design. We will use design-based research methods in this study with the intention of sharing our findings with educators and other researchers to improve educational practice (Amiel & Reeves, 2008; Wolcott et al., 2019). We will meet the following objectives:

1. Iterative improvement on the initial design of the VP training, guided by feedback from speech-language therapy (SLT) students, professionals, educators and patients.
2. Testing the effect of training on students' attitudes, knowledge and skills.
3. Compare patient attitudes to person-centred communication in healthcare before and after exposure to training materials.

We will conduct the study in 4 phases. Phase 1 will consist of usability testing with 10 SLT students. We will measure the effect of training on attitudes and knowledge about clinical empathy and person-centredness. We

will seek feedback from students to guide improvements in training design regarding the following:

- the VP experience (case realism, dialogue, emotions, computer-generated voice quality)
- person-centred communication tasks
- and the personalised system feedback provided to them on their progress.

Having improved the training based on the results of phase 1, we will seek feedback from patients, SLT professionals and educators on the training content, which will result in further modifications and improvement (phase 2). We will offer the training to a broader group of students in phase 3, aiming for 50 students to participate. We plan to approach SLT students in Australia and New Zealand. We will measure participant attitudes and knowledge of person-centred communication via a survey before and after training and progress in developing communication skills during training. We also plan to capture the learning context through another survey related to previous experience with communication skills/empathy training and previous experience treating patients. In phase 4, we will seek feedback on training results from patients, SLT professionals and educators.

The experimental studies were approved by the University of Auckland Human Participants Ethics Committee on 14/02/2022 for three years (reference: UAHPEC20506).

Project timeline and impact

This research project aims to build effective empathic communication training for healthcare students. To consolidate the knowledge available on this topic, we conducted an umbrella review of empathy training in healthcare and developed a framework for effective communication skills training. The advantage of this review was the inclusion of various training methods, not limited to simulation and VPs. This allowed us to consolidate known training mechanisms and useful design elements into our framework, applicable across training methods.

Self-reflection was shown to be a powerful mechanism for learning communication skills. Individualised feedback enables self-reflection and allows for deliberate practice focusing on areas that need improvement. We aim to build an automated tool capable of delivering accurate, personalised feedback. VPs offer flexibility and ease of access, enabling unlimited practice opportunities. The most important advantage of this training method is delivering cost-effective personalised learning. We aim to use co-design principles - involving patients, educators and students -to design the training.

The literature review and umbrella review have been completed. The project is due for completion in December 2024. Future work will involve testing students' skills in real patient encounters and measuring the effect of training on patient experience and outcomes.

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