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## PTAS Project Report (for REGULAR PROJECT GRANTS)

**Project Title: Through the patient's eyes: using virtual reality and patient narratives to teach empathy to medical and nursing students**

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**Project type : A Research Project**

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Empathy is a key skill for healthcare professionals, yet worryingly, research suggests that empathy levels decline as students progress through their undergraduate education. To address this need within the University of Edinburgh Medical School we introduced empathy teaching into our undergraduate skills programme in 2018. Year 1 medical and nursing students undertake inter-professional workshops on empathy, communication and self-care. Discussion during the empathy sessions revealed that students were unable to truly understand patients' experiences – a key construct in the concept of empathy. Virtual reality (VR) is an emerging technology in medical education where it can be utilised to create an impression of clinical areas and patient care. We propose that by utilising VR to create clinical cases from a patient's perspective, allowing students to see 'through the patient's eyes' in combination with patient narratives and sensitive facilitated discussion, we can help students develop a deeper understanding of the patient perspective.

The aim of this study was to assess if VR combined with patient narratives is an effective method to teach empathy to undergraduate medical and nursing students and to assess the acceptability and feasibility of using VR in this way.



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## What did you do?

Two patient experiences were filmed in our simulated ward environment using the 360 degree VR camera placed where the patient would be thus allowing us to film from the patient perspective. This created a 3D experience of 'looking through the patient's eyes when playing back the video through the VR headset. The patient cases were: 1. A patient who needs help with basic aspects of care such as feeding and washing following a stroke 2. A patient with abdominal pain in a hospital bed being seen on a post take medical ward round.

Year one nursing and medical students were stratified to either receive either the current empathy workshop (utilising film clips) or the new workshop (utilising VR and patient narratives). A validated empathy questionnaire; the Jefferson© scale of empathy was gathered from students before and after the session using an online platform administered by The Thomas Jefferson University. Initial evaluation questionnaires immediately post session were used to gather student perceptions of the empathy teaching and the feasibility and acceptability of the VR approach. Follow up questionnaires several months later allowed students the opportunity to further reflect on what they had learned during these sessions.

Participation in the study was entirely voluntary and students were able to withdraw consent at any time. Data was anonymised and securely stored. All teaching materials and a desktop version of the VR cases were made available to students from both groups once the questionnaires had taken place. Ethical approval for this study was granted by the University of Edinburgh, Medical Education, Research Ethics Committee.

## What did you find out?

The study was carried out between January and June 2022. 173 students from a possible 298 (58%) consented to participate in the study and completed Jefferson© empathy scores before their teaching session, 86 from the standard teaching group and 87 from the VR teaching group. 32 (37%) students from the standard teaching group and 27 (31%) from the VR teaching group completed post-teaching session scores. Both groups consisted of similar demographics. Empathy scores increased in both groups following their teaching with no statistically significant difference between the two groups. Mean empathy scores in the standard teaching group increased from 116.9 (7.8) to 121.2 (6.5) and for the VR teaching group from 115.7 (10.8) to 119.6 (7.3).

Study participants were matched in terms of pre and post test scores and paired t-tests were calculated. There was a significant increase in empathy scores for both groups but more so in the VR teaching group. Mean scores increased from 119.5 (4.7) to 122.1 (5.7) ( $t= 2.59$ ,  $p < 0.05$ ) in the standard teaching group and 114.8 (8.9) to 120.4 (7.8) ( $t= 4.71$ ,  $p < 0.0001$ ) in the VR teaching group. The practical effect size of increase was greater in the VR group with Cohen's  $d$  of 0.63 compared to 0.55.

Initial post-session feedback questionnaires were returned by 23 students, using likert scales from 0-10, 91% of students rated both the usefulness of the teaching and the relevance and content as 7 or more. Analysis of free text data showed that students found the teaching to be interesting, interactive and fun. Students valued '*seeing it from a patient's viewpoint*' and found the VR experience to be '*more valuable than just watching the video on a screen*' and allowed them to '*really experience the patient perspective rather than having to imagine it*'.



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A subsequent follow-up free text survey in June 2022 was returned by 30 students. Themes to emerge from analysis of the comments included students developing a deeper understanding of the vulnerability of patients; *'how scary it can be for patients who are surrounded by healthcare professionals'* a better awareness of the importance of empathy towards patients; *'keeping an open mind'*, *'seeing them as people first and patients second'* and making *'sure to listen and understand people'*. Students also appreciated the opportunity to explore empathy in an inter-professional group and enjoyed having *'a taste of what it is like working together'*, although students felt that the groups were often mismatched, given the large numbers of medical students and small numbers of nursing students.

Limitations of this study included the small number of nursing students compared to medical students making it impossible to meaningfully compare empathy scores in the two groups. Follow up Jefferson© scales were completed by less than 40% of participants. We had intended to conduct focus groups to explore student perspectives following the teaching in more detail but were unable to recruit students. Future work is required to see if this improvement in empathy scores is a lasting effect, and we hope to reassess Jefferson© a year on.

In conclusion, teaching empathy to medical and nursing students utilising VR is a feasible, acceptable and effective approach. Empathy scores were shown to increase significantly more in the group that received VR rather than standard teaching. Use of VR helps students develop a deeper understanding and appreciation of the patient perspective.

### **How did you disseminate your findings?**

Data collection was finished in June 2022, as the project had to be delayed during the early phases of the COVID-19 pandemic when face to face teaching was limited. We plan to actively disseminate the findings of this research project at conferences in 2023 including;

\*Scottish Medical Education Conference – May 2023

\*Edinburgh University Learning and Teaching Conference – June 2023

\*ASME - Association for Medical Education Conference - July 2023

\*AMEE- An International Association for Health Professionals Education - August 2023

We are also aiming to publish a paper reporting this research in the 'Medical Teacher' Journal.

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Our project was the runner up in the 'Innovative use of technology' section of The Herald Higher Education Awards in May 2022. We were also delighted to be asked to give an interview on 'Can empathy be taught?' for the University of Edinburgh Development Trust to inform alumni and donors to the Edinburgh Fund.

### **What have been the benefits to student learning?**

Students benefitted from the opportunity to 'see through the patients eyes' allowing them to develop a greater understanding of the patient perspective which is a key component of empathy. We have found that students find learning using VR to be engaging and interactive and we have started to use VR as an adjunct to learning in other areas such as acute care.

### **How could these benefits be extended to other parts of the university?**

Empathy is not just an essential attribute for medical and nursing students but a key skill for all students who graduate from the University of Edinburgh, particularly those undertaking vocational degrees. We believe that our approach of using 'through the 'x' eye's' VR videos followed by a facilitated debrief could be widely applied across other curricula such as veterinary medicine,



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divinity, law and education. Our experience utilising VR as an adjunct to face to face teaching has allowed us to develop expertise in this field and we would be keen to network and share experiences with other teachers in the University of Edinburgh who are using VR, or similar innovative techniques.

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