VR Task

During this task, medical students will perform a simulated paediatric patient scenario where they will be expected to diagnose the patient and treat the patient appropriately. The scenarios will be implemented using software provided by Oxford Medical Simulation (OMS) and participants will perform the scenarios in Oculus VR headsets. Participants will be given a time limit to work through the scenario, but can stop earlier if they feel they would be ready to hand off the patient case to another clinician and if they feel they have completed the necessary steps in their patient management plan. Whilst in the scenario, the participants are able to perform a number of actions that are naturalistic to real medical practice. This includes asking for information about the patient history, performing bedside tests, administering medication and patient management (e.g. oxygen nebulisation) among others. 60 fifth year medical students will be recruited as part of teaching sessions run by OxSTaR.

Questions/Hypotheses

*We will determine whether participants (medical students) grouped by their medical knowledge/ability have differing levels of confidence and likelihoods of missed diagnoses. We expect higher medical knowledge to result in higher confidence and lower likelihoods of missed diagnoses.*

*We will determine whether medical knowledge is related to similarity in information seeking. We expect that higher medical knowledge/ability participants will have higher similarity of information seeking within their group compared to lower knowledge/ability participants.*

*We will determine whether participants (medical students) grouped by their medical knowledge/ability have differing levels of accuracy of patient understanding after controlling. We expect that higher medical knowledge/ability participants will have higher accuracy in assigning patient severity.*

Participants will perform two paediatric sepsis scenarios. One is the Control scenario. This is one where participants can perform the scenario without interruption. Their performance on this scenario will be compared against their performance on the Test scenario.

As medical students are completing the Test scenario, their scenario will be paused to answer a set of questions. Before starting, participants will be asked to pause once they have taken a patient history and are ready to begin a treatment/management plan for the patient. At this point, they answer the following questions:

**ID:**

**At Pause Point:**

* What is your primary diagnosis that you will be seeking to treat?
* How likely is it that your diagnosis is correct? (1-10 scale)
* What is your differential/alternative diagnosis if you have one?
* How likely is that you have NOT missed a diagnosis that will harm the patient (1-10 scale)
* How confident are you that you understand the patient’s condition? (1-10 scale)
* How severe do you think the patient’s condition is? **7 point scale:**

At the end of the scenario (a maximum of 12 minutes), participants will answer the following questions as part of their debrief:

**End of scenario (after 20 minutes)**

* How confident are you that you understand the patient’s condition? (1-10 scale)
* What is the most likely course of the patient?
* Would you be prepared to leave the patient prior to a senior review? (Yes/No)
* Did you complete all the history, examinations and investigations necessary? (Yes/No)
* If no, what else would you do if given more time?
* What investigation would you give highest priority next?
* How severe do you think the patient’s condition is? **7 point scale**

During the scenario, whilst in VR, participants will be asked to complete the Patient Early Warning Score (PEWS) questionnaire. They must complete this at some point during the scenario, preferably just before they arrange to hand over the patient (i.e. just before they end the scenario).

We also gain data on every action and test performed by the participant, as well as all information that is requested. We use the latter group of data to look at differences in information seeking. With the OMS VR software, participants are marked on their performance based on whether they perform certain actions or reach certain milestones during the scenario (defined a priori). This will be run as a within-subjects study whereby all participants do both scenarios in a random order.

In sum, we can derive the following dependent variables:

* Confidence in diagnosis (during and after the scenario)
* Early warning score (PEWS)
* Patient severity score (during and after the scenario)
* Likelihood of not missing a differential
* Order (whether participants perform the Test or Control scenario first)

For both scenarios, we get the following

* Information gathered (tests, physical examinations) during the case
* Performance score (computed within the OMS software)

Below is the scale we intend to use for rating severity of the patient’s condition:

1. Discharge in <4 hours, follow up/investigations as outpatient
2. Discharge in <12 hours, after inpatient investigation/results
3. Ward admission with observations as per NEWS score
4. Continuous monitoring in ward
5. HDU/ITU admission
6. 1:1 medical care until senior doctor arrives
7. Cardiac arrest/peri arrest team required

The PEWS Score is graded by participants as follows, with the total score calculated by summing the values across all fields:

**Conscious Level:** Normal = 0, Decreased = 1

**Respiratory Rate:** 20-30 breaths per min = 0, < 20 breaths per min = 1, > 30 breaths per min = 1

**Respiratory Distress:** None = 0, Present = 1

**Oxygen Saturation Level:** SpO2 > 94% on air = 0, SpO2 < 94% on air = 1, Requiring Oxygen = 1

**Heart Rate:** 70-12 0bpm = 0, < 70 bpm = 1, > 120 bpm = 1

**Doctor/Family/Nurse Concern?:** No = 0, Yes = 1