



Evaluation of the Body Interact Virtual Patient Simulator Device in Training Medical Students

Ryan Ball, OMSIII; Emily Sherwood, OMSII; Rebecca Ryznar, PhD; Anthony LaPorta, MD, FACS; Qamrul Choudhury, PhD.

ROCKY VISTA UNIVERSITY COLLEGE OF OSTEOPATHIC MEDICINE

INTRODUCTION

Body Interact is a virtual clinical education platform system that has the capability to train students via virtual patients built with artificial intelligence. The program aims to improve critical thinking and clinical decision-making and sets a new standard in competency education and meaningful assessment. Using a large interactive screen, students talk to the patient to gather a full history, do a complete physical exam, order labs and imaging, administer medication, and perform interventions to a simulated virtual patient. Every medical decision influences the patient's reaction, and inappropriate medical decisions may result in patient deterioration. At the completion of each scenario, performance metrics are provided in accordance to the well-established guidelines and learning objectives for each case. A timeline report provides a detailed sequence of actions taken during the simulation and the immediate consequences on patient's vital signs and health conditions. Clinical virtual simulation can provide a pedagogical strategy, yet little is known about its effectiveness with regard to knowledge retention, clinical reasoning, self-efficacy, and satisfaction. This is a rapidly developing discipline that can provide effective learning environments for medical students.

OBJECTIVES

This study aims to evaluate the effectiveness of clinical virtual simulation with regard to knowledge retention, clinical reasoning, self-efficacy, and satisfaction when performing clinical objectives and attaining differential diagnosis on simple, intermediate, and complex clinical cases among medical students.

METHODS

Clinical cases from various disciplines including Urology, Cardiology, Nephrology, Endocrinology, Allergy/Immunology, Neurology, Pulmonology, Orthopedic, Pediatrics, Anesthesiology, Gastroenterology, Infectious Diseases, Internal Medicine, Obstetrics/Gynecology, Toxicology and Trauma, simulating from acute to chronic conditions treated in the emergency room were randomly assigned to different 5 to 6 person groups out of a pool of 40 total students using the Body Interact simulation system. Each case took 7-14 minutes. A team leader was assigned for each group. A variety of clinical questions were given to the students during the encounter. These clinical questions are USMLE-style. A Clinician was present to mentor each group of students and to facilitate the learning environment and to help come to a differential diagnosis. A post survey with a series of questions utilizing a Likert scale from 1-5 was conducted to assess learning outcomes.



Figure 1. Students working on Body Interact case on group table with oversight of preceptor.

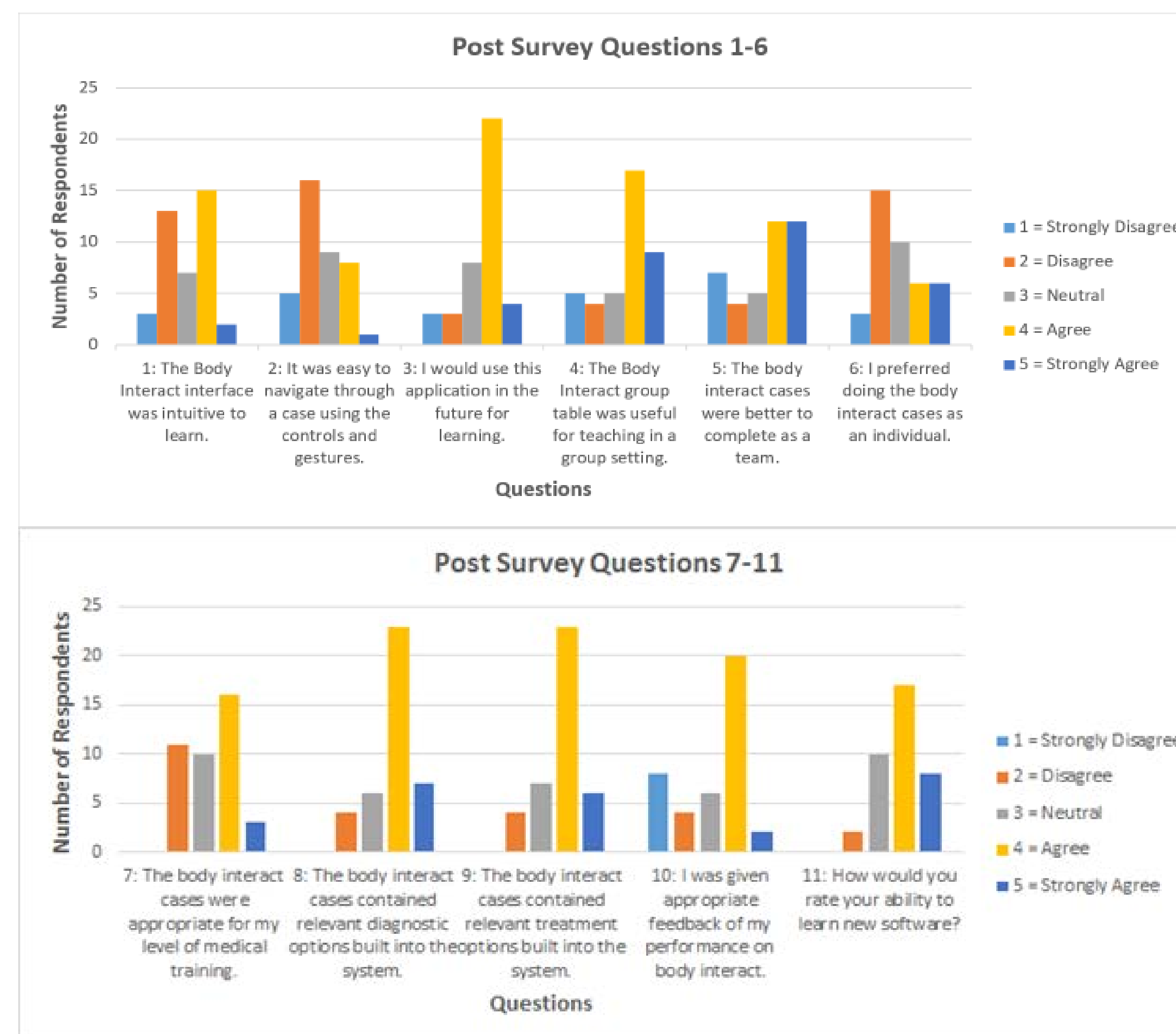


Figure 2. Body Interact post survey responses. Total number of respondents = 40 second year medical students. Question 2 represents a total of 39 responses and Question 11 represents a total of 37 responses.

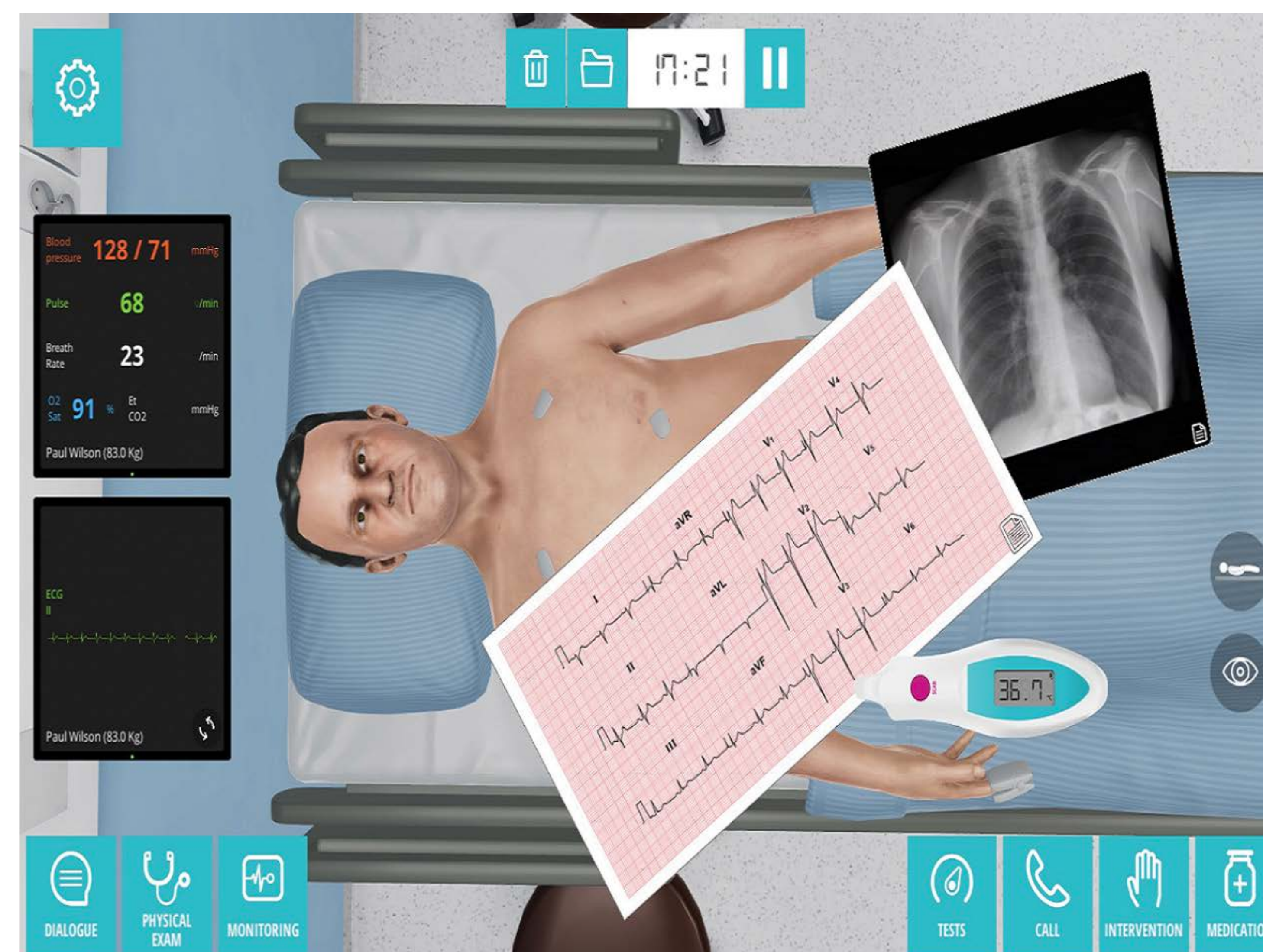


Figure 3. Clinical virtual simulation in hospital environment.

RESULTS

A total of 40 second year medical students participated in the Body Interact simulations. Most students agreed that they would use this application in the future for medical school curriculum with 22 students responding "Agree." In addition, the majority of students surveyed agreed that the Body Interact cases were better to complete as a team with 12 students responding, "Agree" and 12 students responding, "Strongly Agree." Moreover, most students surveyed agreed that the body interact cases contained relevant diagnostic and treatment options with 23 students responding "Agree" to both questions, respectively. 20 students agreed that they were given appropriate feedback of their performance on assigned cases. On the other hand, students did not agree that it was easy to navigate through a case using the controls and gestures with 16 students responding, "Disagree" and 5 students responding, "Strongly Disagree." The post survey results are illustrated in Figure 2.

DISCUSSION

Results of the post survey suggest positive feedback regarding the use of Body Interact in medical school education and also offer some suggestions for improved user experience. The post survey indicates that clinical virtual simulation raises the level of satisfaction with the learning experience among medical students. Furthermore, the indications that the cases were better to complete as a team and the Body Interact group table was useful for teaching in a group setting suggest utility in completing the cases with the aid of others. This prepares students for the transition from classroom education to learning within various healthcare roles when performing real patient care. Although most students agreed that the Body Interact cases contained relevant diagnostic and treatment options, students did not agree that it was easy to navigate through a case using controls and gestures. This suggests room for improvement of simulation design. Overall, the results and feedback were positive, supporting the use of Body Interact in medical school curriculum. Body Interact simulation platform can be very versatile as cases from simple to moderate to complex, or from acute to chronic. Cases can be used for different levels of students for differential diagnosis.

FUTURE STUDIES

Future studies are needed to assess effectiveness of clinical virtual simulation by stratifying users based on level of healthcare experience and matching this with difficulty level of the simulation cases. This would enable us to better tailor patient cases to pre-medical, medical/post-graduate school, and clinical education.

ACKNOWLEDGEMENTS

I would like to thank Dr. Qamrul Choudhury and Dr. Rebecca Ryznar and for their guidance and input throughout this project. Thank you to Dr. Anthony LaPorta, Dr. Michael Czekajlo, and Dr. Renato Rapada for connecting us with the Body Interact team and acting as facilitators. To the Body Interact Staff for showing us all program capabilities, helping manage technical difficulties, and ensuring that the program ran smoothly.