

**Nursing Education Research Conference 2020**  
**A Multi-Site Study Evaluating a VR Game for Reinforcing Sterile Catheter Insertion Skills**

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**Purpose:**

Though taught and tested, many clinical skills, thought of as cornerstones in nursing, are often unused but quickly forgotten. Aseptic procedure for catheterization is one such cornerstone skill. Research repeatedly indicates students do not retain this skill. Virtual reality (VR) is one solution to known contributors to poor skills retention. Educational theories supporting use of VR for skills learning include: cognitive load theory, mastery learning, repetitive practice, and overlearning. This multi-site study evaluated the usability of a VR game with haptic interface for refreshing and reinforcing aseptic urinary catheterization skills in undergraduate nursing students, extending the previous work of XXXXXX.

**Methods:**

Two-hundred ninety-one students from nine US nursing participated in this IRB-approved study; all site coordinators were trained to use the game. All sites bought the gaming equipment and received the study software for free. All previously learned aseptic catheterization in their respective nursing programs. Participants completed demographic information and questions about their gaming experience donned VR headgear, and participated in the game. Upon completion, students completed the System Usability Score (SUS) and User Reaction Survey (URS) adding additional comments.

**Results:**

Findings revealed an overall SUS of 57 (SD=17.3), an average range on the SUS. Usability was also operationalized into low, medium, and high groups based on SUS tertiles. There was an association between gender and usability of the instrument ( $P < .0001$ ). Over half of the male students (53%;  $n=33$ ) judged the intervention as having high usability whereas female students tended to rate the intervention as having low (35%;  $n=79$ ) to medium (53%;  $n=93$ ) usability. User Reaction Survey (URS) data indicated that online gaming experience was associated with the perception of the usability of the intervention ( $P = .1686$ ) while console gaming was not associated with usability ( $P = .7572$ ). Gaming during one's free time was associated with the perception of the usability of the intervention ( $P = .0391$ ). Self-identifying as a gamer was also associated with the perception of usability of the intervention ( $P = .0608$ ).

**Conclusion:**

Further research is warranted on this VR as a skills training method. Based on our research, we can conclude undergraduate nursing students are prepared to use and practice skills using VR and may practice and retain more key clinical concepts when using VR.

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**Title:**

A Multi-Site Study Evaluating a VR Game for Reinforcing Sterile Catheter Insertion Skills

**Keywords:**

gaming, nursing students and virtual reality

**Abstract Summary:**

This multi-site study evaluated the usability of a virtual reality (VR) game with haptics for refreshing aseptic catheterization skills in 291 nursing students. Findings revealed that undergraduate nursing students are prepared to use and practice skills using VR and may practice and retain more key concepts when using VR.

**References:**

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**First Primary Presenting Author*****Primary Presenting Author***

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**Author Summary:** Dr. Edgren is known for her work in manikin based simulation. However, through a chance email meeting, she has developed and evaluated a VR game and written about virtual reality for several years.

**Any relevant financial relationships? Yes**

**Relationship**

**Description of Potential Conflict**

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game co-inventor	I co-invented this game and could have a perceived COI in the study.
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Signed on 06/06/2019 by *Suzan Kardong-Edgren*

Second Author

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**Author Summary:** Dr. Breitkreuz has taught simulation for over 30 years as nurse, faculty and hospital-based nurse educator. She does research in various aspects of simulation as it pertains to nursing and education.

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**Author Summary:** Dr. Gilbert is an experienced biostatistician and psychometrician with over 25 years of experience and 80 publications. He is widely published in professional education and has considerable experience in simulation, educational gaming, and virtual reality. He is a reviewer for numerous journals including *Advances in Simulation*, *Clinical Simulation in Nursing*, and *Simulation in Healthcare*.