

The Development and Evaluation of an Ebola High-Fidelity Simulation Scenario for Baccalaureate Nursing Students: A Pilot Study

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DISCLOSURES

- Conflict of Interest
 - Alison H. Davis reports no conflict of interest
 - Jennifer M. Manning reports no conflict of interest
 - Julia Greenawalt (INACSL Conference Administrator & Nurse Planner) reports no conflict of interest
 - Leann Horsley (INACSL Lead Nurse Planner) reports no conflict of interest
- Successful Completion
 - Attend 90% of session
 - Complete online evaluation



OBJECTIVES

- Upon completion of this presentation, participants will be able to:
 1. Understand the process for the development of an Ebola simulation scenario
 2. Identify the components of a pilot study
 3. Describe appropriate PPE for an Ebola patient



Background

- High fidelity human patient simulation (HF-HPSim) an established teaching pedagogy in nursing education
 - 1990s
- Increases quality and quantity of learning experiences



Review of Literature

- Jeffries and Clochesy (2012), “Simulations can provide an innovative, experiential approach to teaching that actively involves students in their learning process. By interacting with simulations, the learner is required to use a higher order of learning than simply mimicking the teacher role model”
(p. 359-360)



Review of Literature

- Active observation of students allows faculty to
 - Provide real-time positive feedback during **debriefing**
 - Learners experience the “light bulb” moment

(Henneman, Cunningham, Roche, & Curnin, 2007; Smith, 2009; Sullivan-Mann, Perron, & Fellner, 2009; Swenty & Eggleston, 2011; Weaver, 2015).



Background

- Current focus of HF-HPSim
 - Educate/enforce basic assessment skills
 - Expose students to critical events in the delivery of patient care
- Need for expanded focus
 - Recent communicable disease outbreaks

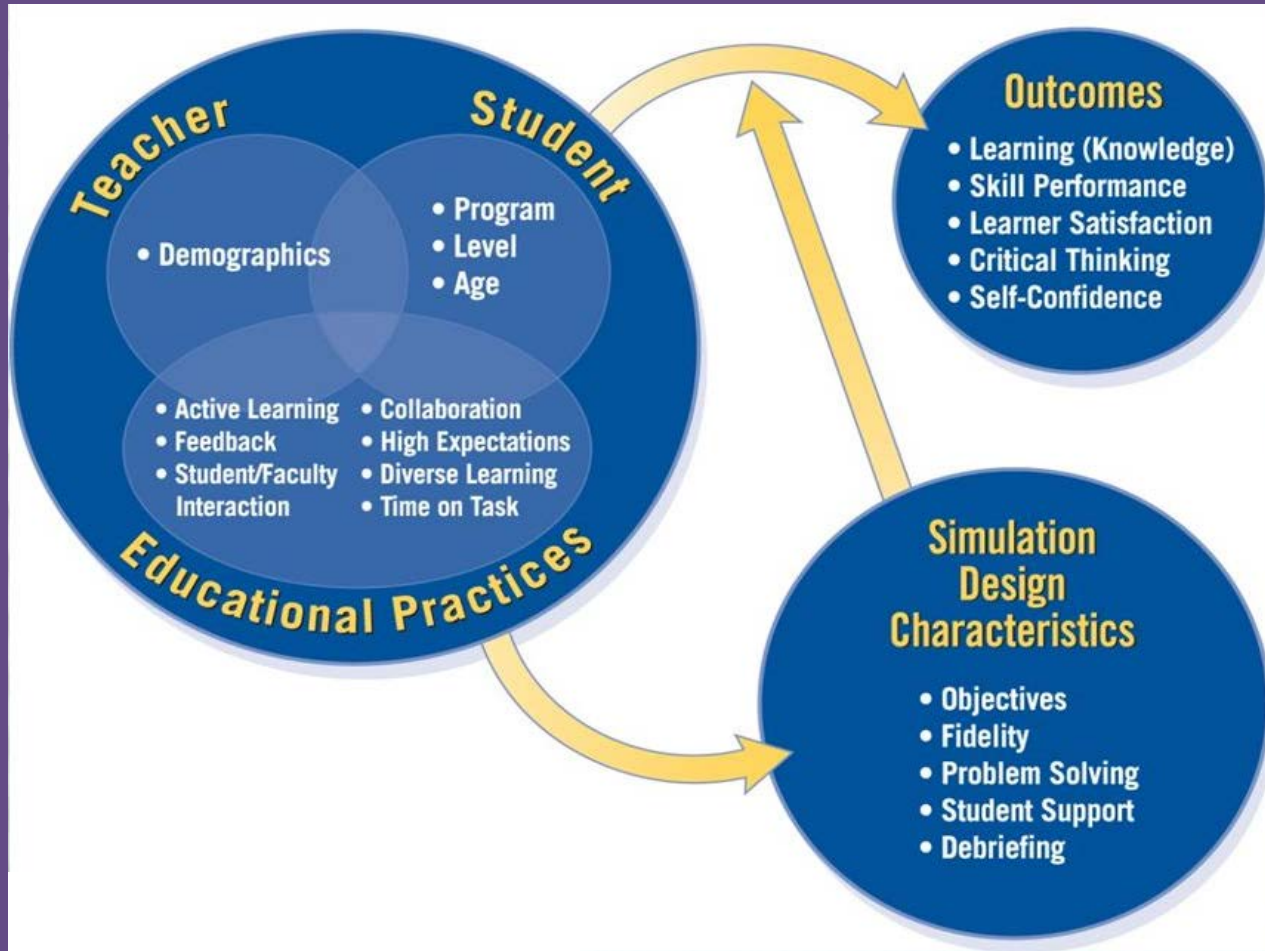


Background

- Student nurses are unlikely to encounter care of an Ebola patient:
 - Rare occurrence
 - Need for highly skilled nursing care
- HF-HPSim is an ideal strategy
 - Safely exposes student nurses to the high level of care
 - Safely participate in direct patient care



The NLN/Jeffries Simulation Framework



(Jeffries, 2012)



Purpose

- To evaluate a newly developed Ebola simulation scenario in a baccalaureate nursing program.



Methods

- Design
 - Pilot study
 - Descriptive
- Sample
 - Purposive sample
 - Undergraduate BSN students
 - The inclusion criteria:
 - students enrolled in a senior level nursing course
 - ability to speak, read, and write English
 - 18 years or older



Methods cont'd

- Human Subject Protection
 - Participants were given:
 - Letter of invitation/consent
 - Photography consent
 - Only used for research purposes
 - Facial obscuring
 - Date, time, and location of the simulation
 - Neither researcher was currently serving as a faculty to study participants
 - Full exempt approval received
 - Health Sciences Center IRB



Methods cont'd

- Setting
 - High-fidelity human patient simulation lab
 - 5th floor of school of nursing
 - Private area
 - Pre-briefing
 - Debriefing
 - Survey completion



Methods cont'd

- Educational intervention (Ebola scenario)
 - Provides goals
 - Synopsis
 - Supply list
 - Mannequin preparation directions
 - Including fluorescent agent
 - Pre-briefing points
 - Link to a 13-minute video
 - CDC PPE donning and doffing procedures for Ebola
 - <http://www.medscape.com/viewarticle/833907>



Educational Intervention (con't)

- Unfolding case
- Organized in four (4) phases or states
 - Contains minimal expected participant behaviors
 - Teaching points for debriefing
 - Participant preparation questions
 - Patient background
 - Initial set of healthcare provider orders



Educational Intervention con't

- Prior to scenario
- All participants assigned role
 - Assessment nurse (2)
 - Treatment nurse
 - Medication nurse
 - Recorder nurse
 - Safety nurse
 - Observer
- Given 10 minutes to discuss roles, nursing priorities, interventions, ask questions



Abridged Ebola Scenario

State	Description	Simulation or Actions	Healthcare Provider (HCP) Orders	Learner Expected Behaviors	*Faculty Role
	Learner's Preparation for Scenario	HR= 110, BP 106/50, RR 22 Breath Sounds = clear; Heart Sounds = S1S2; Bowel Sounds = hyperactive; <u>AA&O</u> X4 Red lesions on trunk and arms bilaterally.	<ol style="list-style-type: none"> 1. Hold in ED 2. Activity as tolerated 3. VS Q4 4. IV 0.9%NS at <u>150mL/hr</u> 5. Clear liquid diet as tolerated 6. Acetaminophen <u>650mg PO/PR</u> prn fever, aches 7. Keep O2 saturation \geq 95%. 	<ol style="list-style-type: none"> 1. Actively engaged in <u>prebriefing</u>. 2. Reviews patient background and first order set. 	<ol style="list-style-type: none"> 1. Preparation of room and simulator with fluorescent agent and moulage(simulated rash). 2. <u>Prebriefing</u> of learners including CDC donning/doffing video.



1	Baseline ED Assessment	No change in vitals. Reports "I returned from a Peace Corp		<ol style="list-style-type: none"> 1. Initial assessment & evaluation of data. 2. Communicate d with patient regarding symptoms. 	<ol style="list-style-type: none"> 1. Provide additional assessment details when learner's request, i.e. temperature, complaints of nausea, lab results. 2. Provides additional orders once learners call with assessment results, i.e. rash, elevated temperature, travel to Africa within 10 days.
		mission 10 days ago to Liberia"		<ol style="list-style-type: none"> 3. Reports assessment findings to HCP. 4. Administers acetaminophen. 5. Begins IV infusion 	



2	Patient Deterioration	HR= 122, BP= 102/40, RR= 30; SPO2= 90% RA Breath Sounds = clear; S1S2 present;	Once learners notify HCP: 1. Increase IV to 200mL/hr 2. Vital signs every 15 minutes. 3. Stat labs: CBC, CMP, ABG, ALT/AST, PT/PTT, polymerase chain reaction (PCR), enzyme-linked immunosorbent assay (ELISA), IgM, IgG	1. Reassessment of patient. 2. Recognition of respiratory distress. 3. Elevates head-of-bed. 4. Maintains PPE. 5. Notifies HCP of	1. Provide additional assessment data when learners request, i.e. temperature, rash is now spreading, tender abdomen.
		Bowel sounds= hyperactive; A&O X4 Pt % increasing nausea, diarrhea, headache (4/10), & shortness of breath		assessment findings.	



3	Stabilizing	HR=10 2, BP 102/50, RR= 22 SpO2= 96% Breath sounds= clear; Shortne ss of breath decreasi ng; S1S2; Bowel sounds= hyperac tive A&OX 4	No new orders.	<ol style="list-style-type: none"> 1. Reassessment of patient. 2. Maintains PPE. 3. Communicate s with patient concerning condition. 4. Reports assessment findings to HCP. 5. Once receive announcemen t that the shift is over, doffing of Ebola PPE. 	<ol style="list-style-type: none"> 1. With the patient stabilizing, the faculty announce the learner's shift is over.
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4	Doffing PPE			1. Doffing PPE according to	1. Faculty assume the role of the observer as Ebola PPE is doffed.
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				CDC guidelines.	
	Debriefing				

*Faculty = researcher for this pilot study.





Educational intervention cont'd

- Debriefing
 - Formal session following the scenario
 - Reinforce
 - Ebola knowledge
 - Donning/doffing procedures
 - Clarification of confusing points
 - Review of the high-points of scenario
 - Review of if minimal expected behaviors were met by participants



Instruments

- Demographics
 - Age, gender, race, ethnicity and level of student in BSN program



Instruments

- Simulation Design Scale (SDS; Student Version)
 - Measures presence and importance of five design features of the simulation:
 - Objectives
 - Support
 - Problem solving
 - Feedback
 - Fidelity
- 20 items; 5 point Likert scale



Instruments

- Educational Practices Questionnaire (EPQ; Student Version)
 - Measures presence and importance of four educational practices:
 - Active learning
 - Collaboration
 - Diverse ways of learning
 - High expectations
- 16 Item; 5 point Likert scale



Instruments

- Student Satisfaction and Self Confidence in Learning Instrument (SSSCL)
 - Measures student satisfaction and self confidence in knowledge acquired during simulation
- 13 item; 5 point Likert



Research Questions

- **RQ1.** How do baccalaureate nursing students rate the presence and importance of design features of an Ebola simulation?
- **RQ2.** How do baccalaureate of nursing students rate educational practices of an Ebola simulation?
- **RQ3.** What are baccalaureate nursing student perceptions of self-confidence after the Ebola simulation?
- **RQ4.** What are baccalaureate of nursing student satisfaction levels after the Ebola simulation?



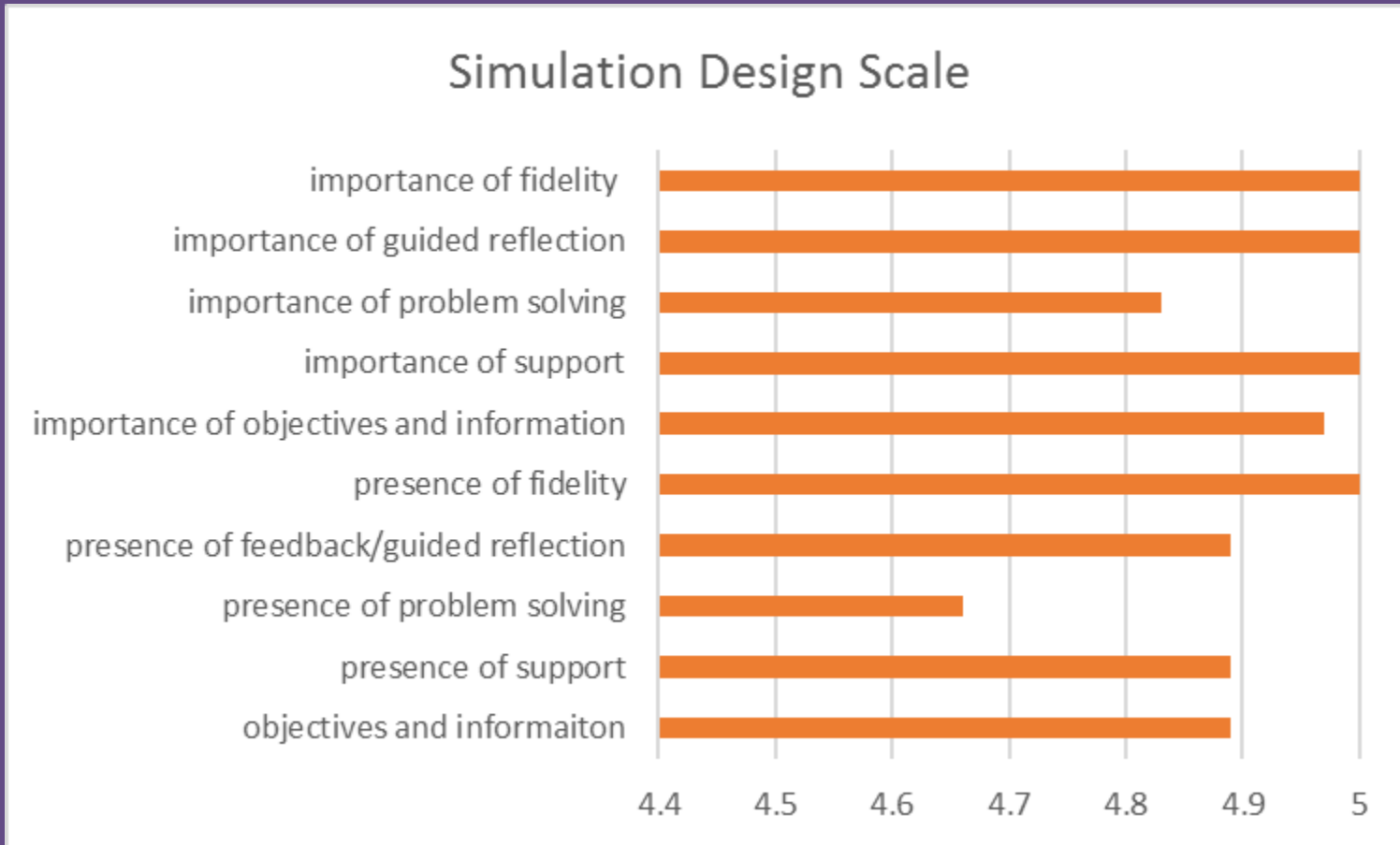
Results- Demographics

	n=7	Percent (%)
Female	7	100
Non-Hispanic	7	100
Caucasian	5	71
African - American	2	29

- mean age- 25

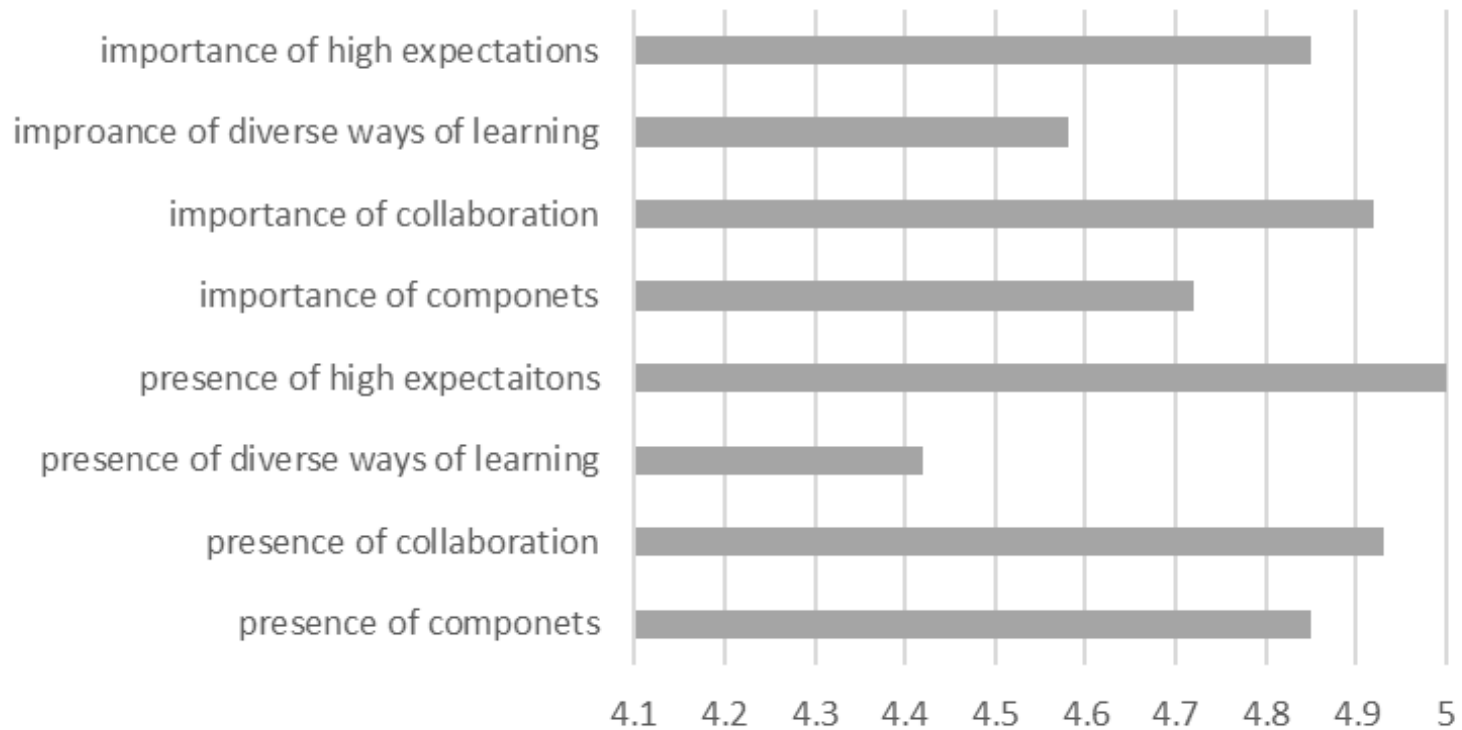


Results – SDS



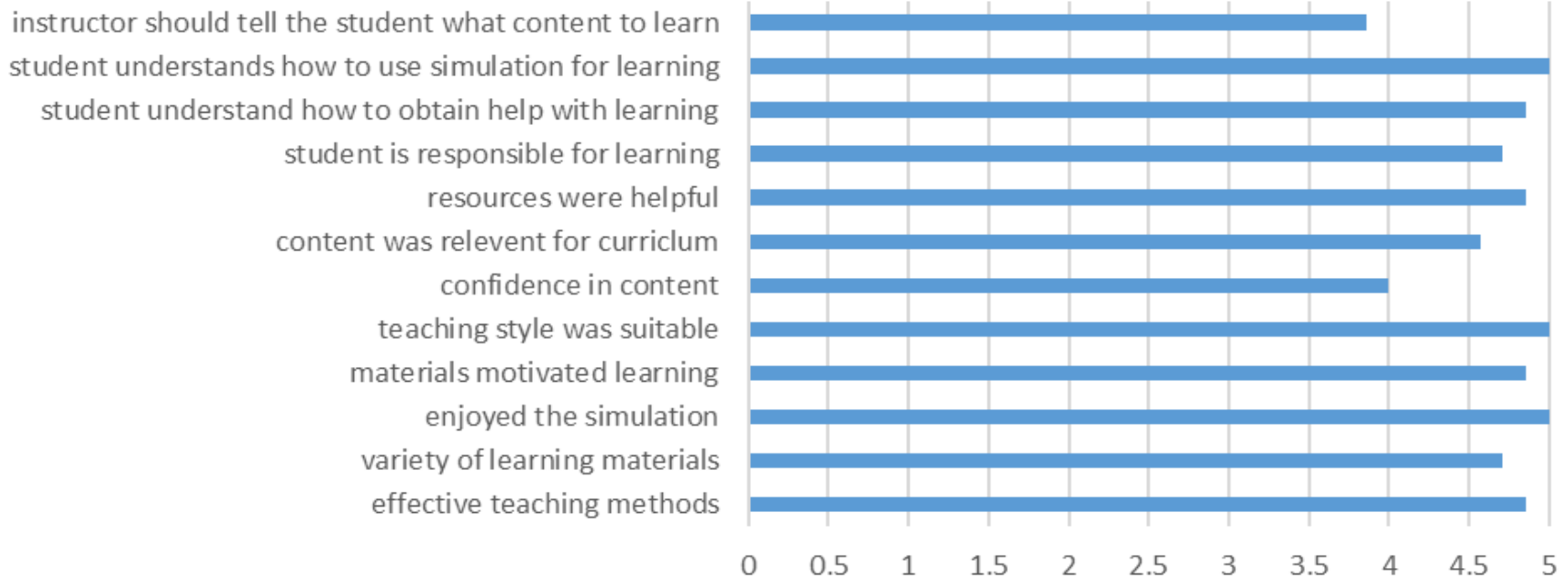
Results – EPQ

Educational Practices Questionnaire



Results – SSSCL

Student Satisfaction and Self Confidence



Discussion

- RQ1
- How do baccalaureate nursing students rate the design features of an Ebola simulation?
 - Participants highly agreed the five key design features of the SDS-Student Version were present and important for the scenario content.
 - One exception
 - Participants did not highly agree with the presence of their ability to problem solve through independently set patient goals during the simulation.



Discussion

- RQ2
- How do baccalaureate of nursing students rate educational practices of an Ebola simulation?
 - Participants highly agreed with the presence and importance of the majority of all components of the EPQ.
 - Exception
 - Participants indicated diverse ways of thinking were not as present in the HF-HPSim.



Discussion

- RQ 3 & 4
- What are baccalaureate nursing student perceptions of self-confidence after the Ebola simulation?
- What are baccalaureate of nursing student satisfaction levels after the Ebola simulation?
 - Results from the SSSCL indicated the participants were highly satisfied and self confident in learning during the HF-HPSim.



Discussion

- Scenario designed to engage the participants in inquiry and discovery surrounding Ebola.
 - Engagement in scenario equal participants
 - Recognized the signs and symptoms of Ebola
 - Reinforced assessment skills
 - Planned care for an Ebola patient
 - Identified and demonstrated the appropriate donning and doffing of Ebola PPE



Discussion

- Fluorescent agent to simulate Ebola contamination.
- Scanning of the participants before the formal debriefing session revealed several participants had “contaminated” themselves during the scenario.
- Point of contamination was unknown initially.



Discussion

- Timeframe before the formal debriefing was instrumental.
 - Participants candidly discussed their thoughts and feelings about the scenario
 - Why did this occur?



Discussion

- Debriefing process
 - Assisted participants to relate all simulation activities together and build a bigger picture of an Ebola patient.
 - Initial cues
 - History triggers,
 - Who to call when Ebola is suspected I
 - Addition to the healthcare provider
 - Difficulties associated with Ebola PPE
 - Challenges surrounding patient care



Limitations

- Use of a small, purposive sample
 - n=7
- Pilot study
- Single site



Recommendations for Future Study

- Specific role of a participant assessment
 - Difficulty communicating to other team members while fully donned in PPE
 - Ability to assess a patient in Ebola PPE
 - Ability to give medications in PPE
- Examination of different participant roles r/o levels of “contamination”



Recommendations for Future Study

- Assessing outcomes of scenario with varying levels of participants



Recommendations for Future Studies

- Further exploration of timeframe before the formal debriefing
- Replication with larger sample size
- Multiple site study



Conclusions

- Results indicated the Ebola HF-HPSim scenario was highly inclusive of key design features and educational practices:
 - Objectives/information
 - Support
 - Problem solving
 - Feedback
 - Fidelity
 - Active learning
 - Collaboration
 - Diverse ways of learning
 - High expectations.



Conclusions

- Participants
 - Highly satisfied and confident in their learning
 - Additional knowledge gain
- Scenario reinforced standard precautions
- Newly developed Ebola scenario successful
 - Illustrated the importance of complex PPE procedures



Questions?



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