SIMULATION RESEARCH: INFORMING BEST PRACTICES IN NURSING EDUCATION

STTI International Nursing Research Congress

Dublin, Ireland 2017

Dr. Susan Gross Forneris, Dr. Diana Odland Neal, Dr. Jone Tiffany

Disclosures

- *Dr. Forneris' study was supported in part by a grant to the National League for Nursing (NLN) from Laerdal Medical and Wolters-Kluwer Health*
- *Dr. Forneris is an employee of the NLN, Washington, DC, USA*
- *Dr. Neal and Dr. Tiffany – no disclosures*

Symposium Objectives

- Discuss findings of simulation research that are informing nursing education to use simulation active teaching strategies.
- Discuss faculty development initiatives to support the changing faculty role with emerging simulation best practices.
- Discuss how to transfer active learning principles from reflective debriefing for use across the curriculum to achieve learning outcomes.

Integrating Virtual Simulation into the Curriculum: An Exploratory Study

Susan Gross Forneris, PhD, RN, CNE, CHSE-A
National League for Nursing

Goals of the Exploratory Study

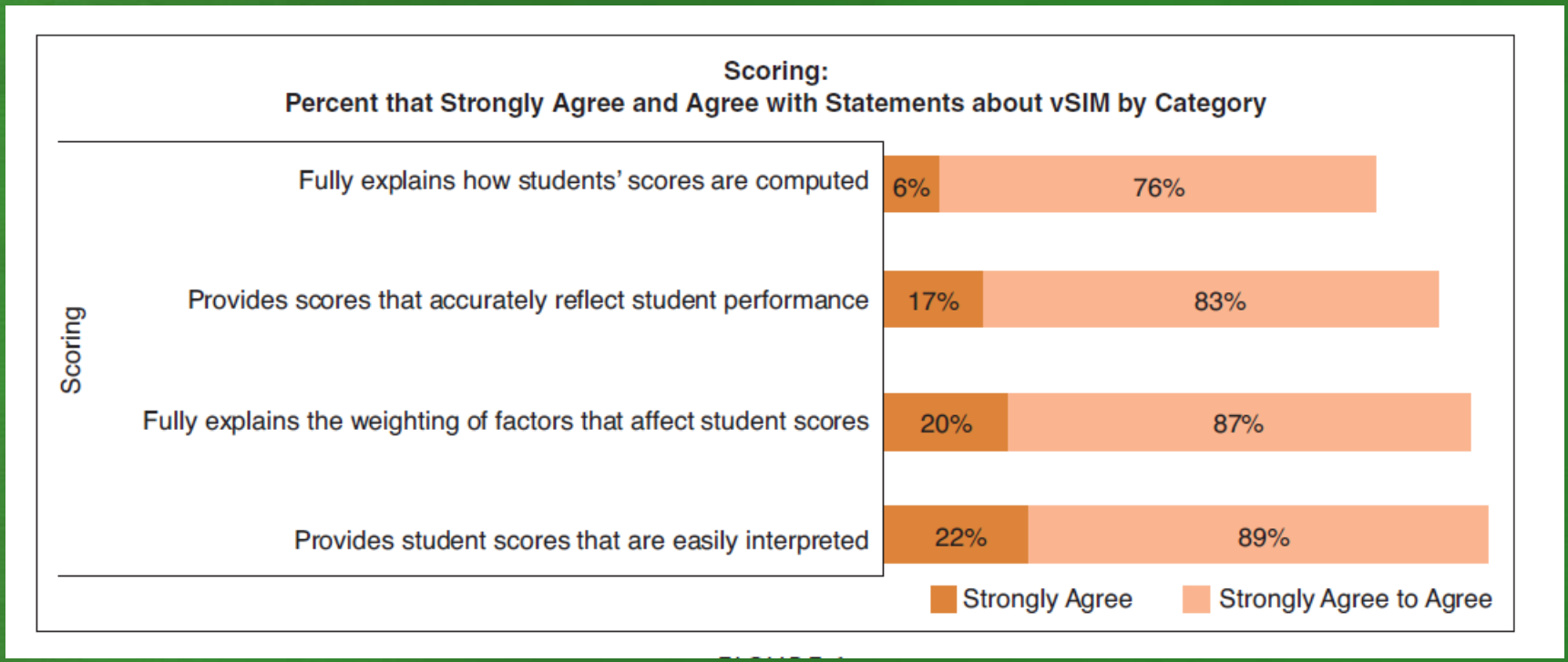
- Integrate vSim for Nursing into nursing curriculum for one semester
- Evaluate the effectiveness of vSim for Nursing as an active learning teaching strategy
- Create a faculty implementation guide as a means of faculty development in the use of a virtual simulation teaching strategy

Focused Areas of Exploration

- *Utility as a teaching tool*
- *Classroom Approaches*
  - Flipping the Classroom
  - Classroom Group Debriefing
  - Small Group Concept Mapping
- *Coursework*
- *Targeted Lab Activity*
- *Remediation*

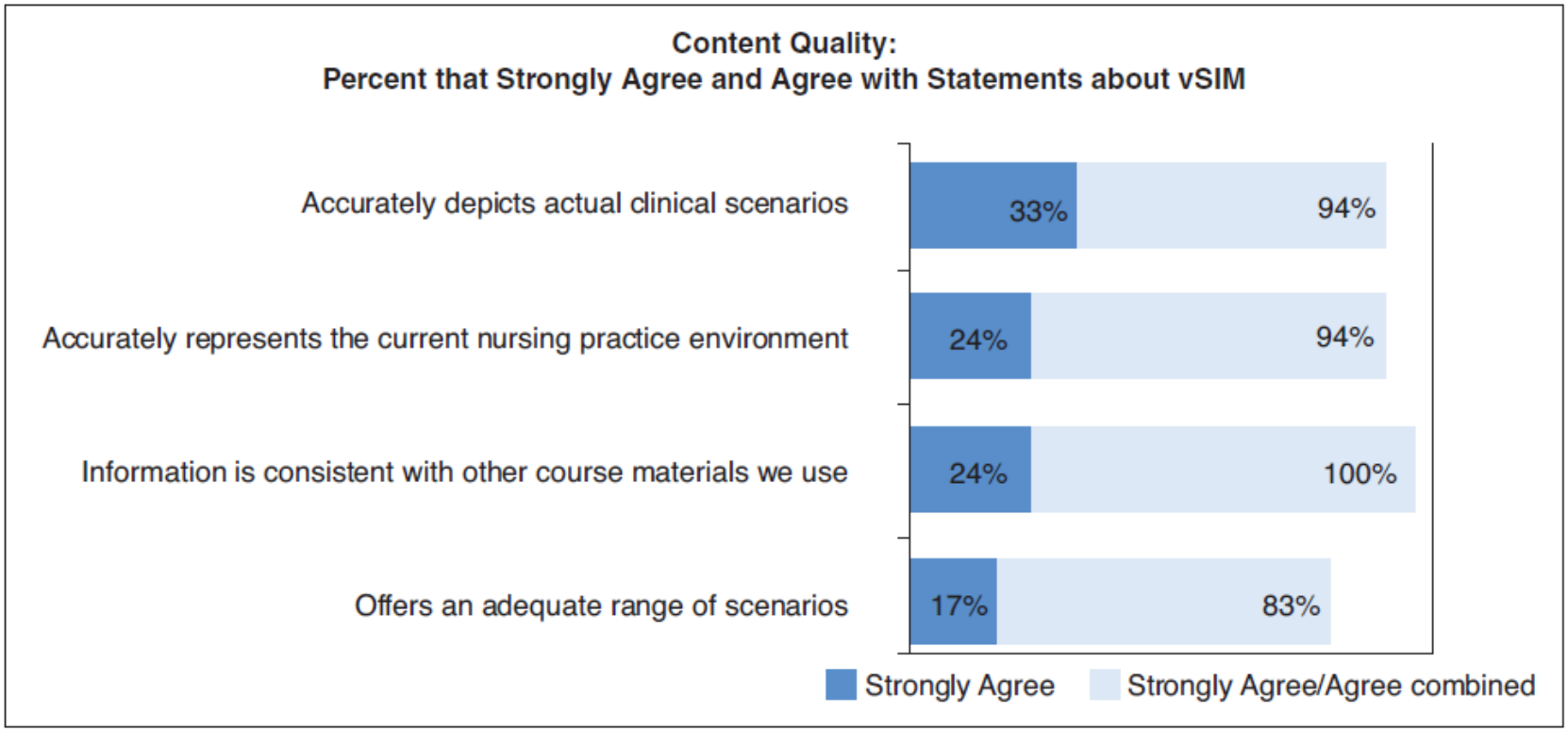
Findings

Summarizes the evaluation of the vSim scoring features by faculty who participated in the pilot study.



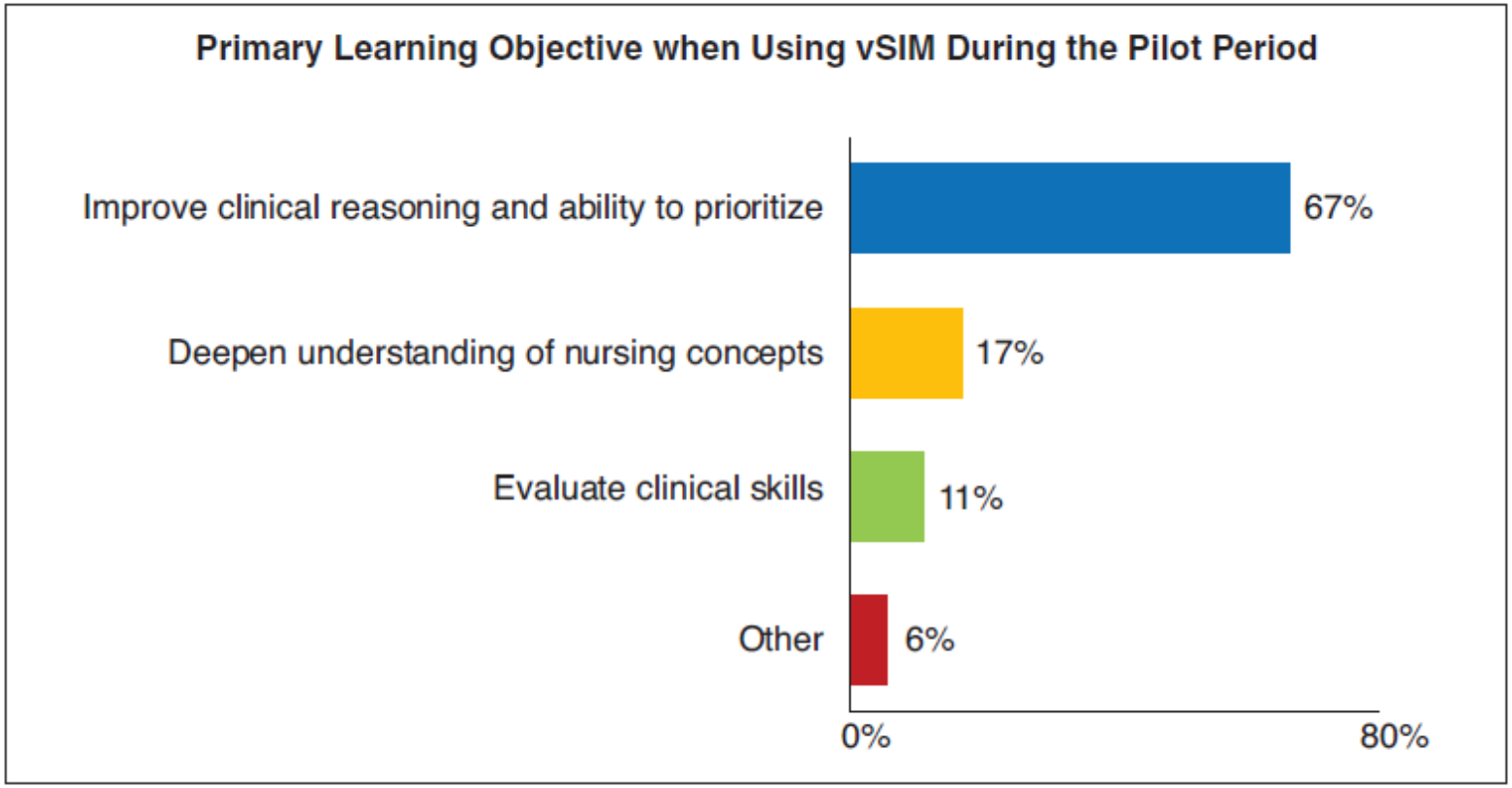
Findings

Content Quality:



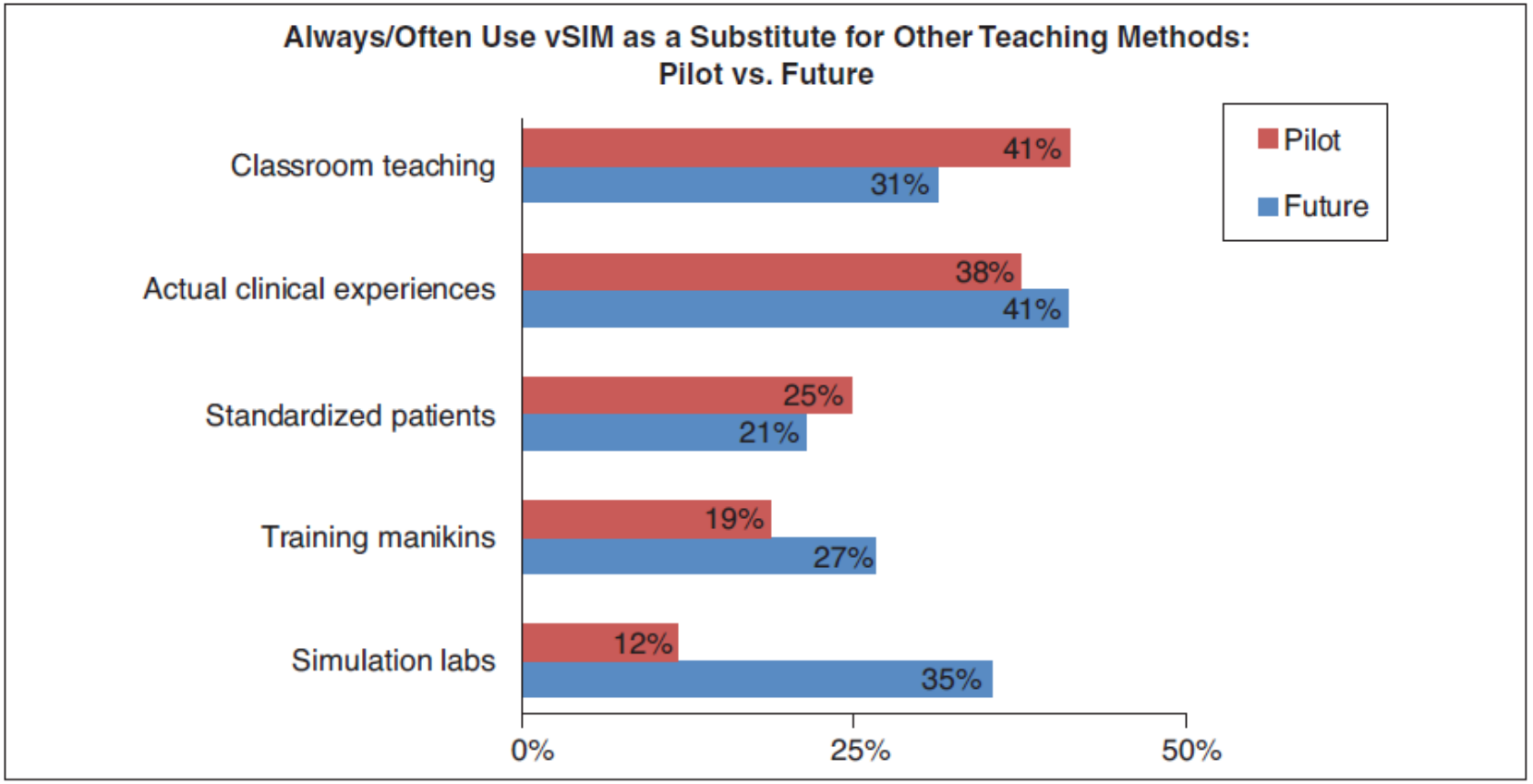
Findings

Primary Learning Objective:



Findings

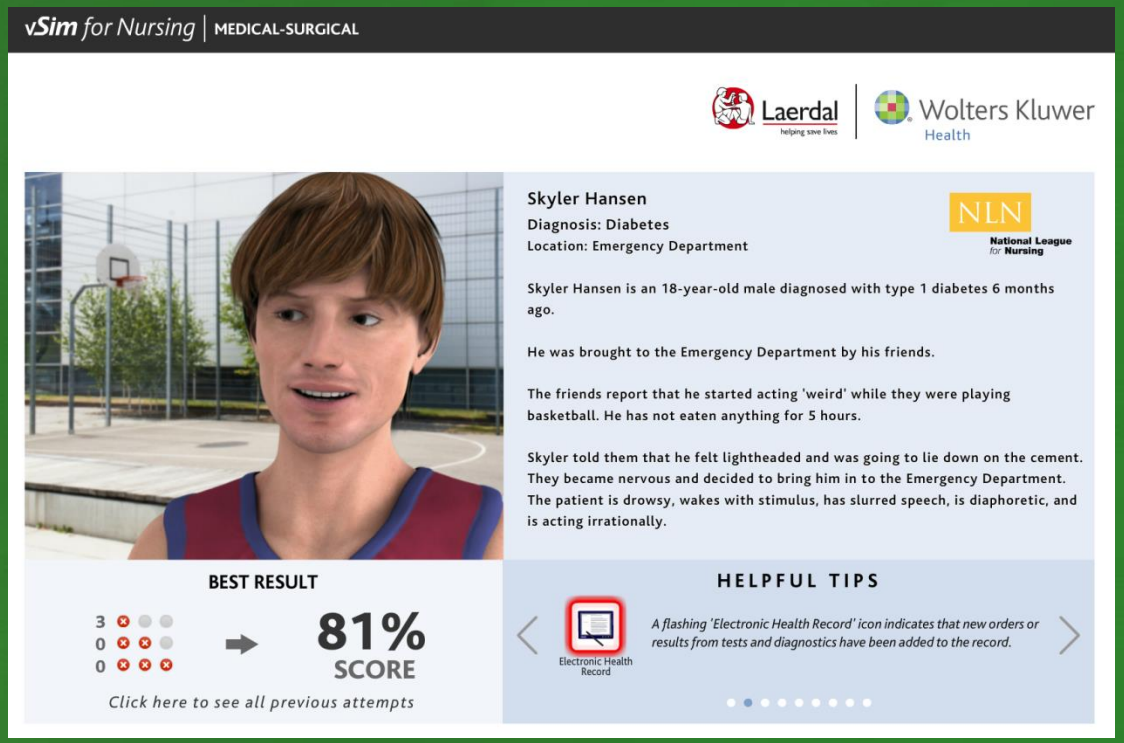
Substitute for other Teaching Methods:



Classroom Approaches

Using Story…Virtual Flipped Classroom

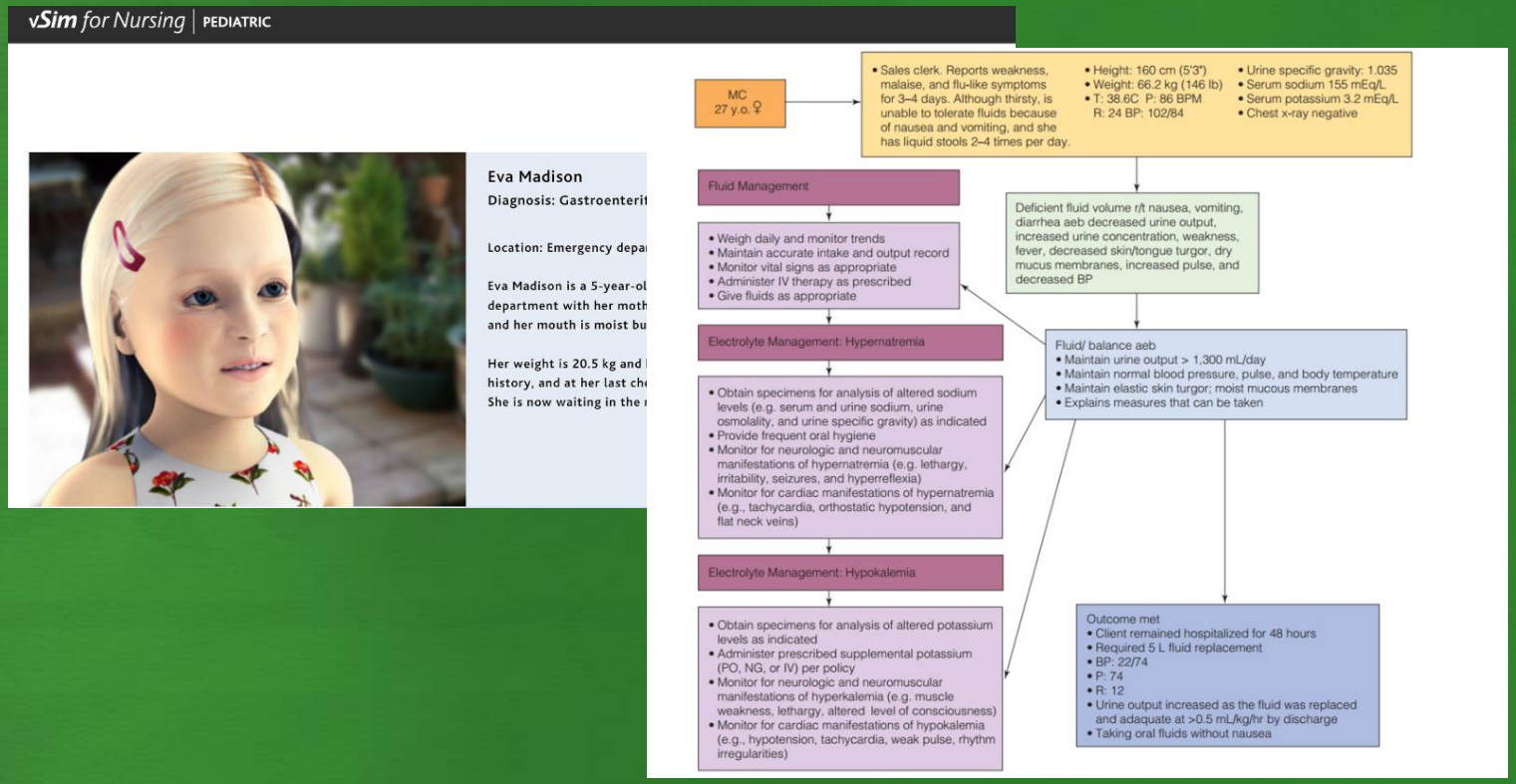
Role modeling critical thinking…virtually



Classroom Approaches

Using story…

Simulation Concept mapping…virtually!



Classroom Approaches

Using story…

Differentiating low acuity – high frequency
from
high acuity !ow frequency

- Pediatric Case 3: Sabina Vasquez (Core)

- Pediatric Case 4: Sabina Vasquez (Complex)

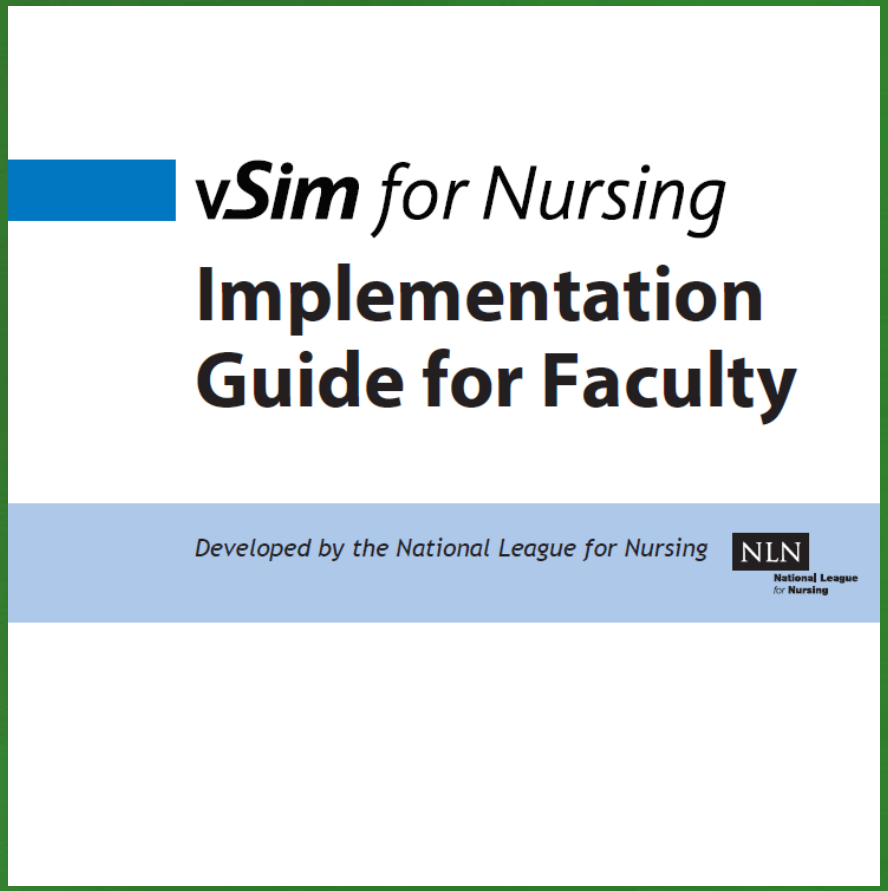
- Maternity Case 1: Olivia Jones (Core)

- Maternity Case 2: Olivia Jones (Complex)

Classroom Approaches

Using story…Delegation and Supervision…virtually

Faculty Development



Using Simulation to Enhance Clinical Reasoning During Medication Administration: A Multi-Site Global Qualitative Study

St. Olaf College (Minnesota, USA)

Kilimanjaro Christian Medical College (Moshi, Tanzania)

Diana Odland Neal, PhD, RN, PHN

CANADA
Regina
Winnipeg
Vancouver
WASHINGTON
Seattle
Portland
MONTANA
NORTH DAKOTA
MINNESOTA
Lake Superior
SOUTH DAKOTA
Minneapolis
WISCONSIN
MICHIGAN
Québec
Montréal
OTTAWA
MAINE
OREGON
IDAHO
WYOMING
NEBRASKA
IOWA
Milwaukee
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Toronto
NEW YORK
Boston
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ILLINOIS
INDIANA
OHIO
Cleveland
PENNSYLVANIA
Pittsburgh
New York
Philadelphia
Baltimore
WASHINGTON, DC
Salt Lake City
NEVADA
UTAH
Denver
COLORADO
KANSAS
Kansas City
MISSOURI
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VIRGINIA
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ARKANSAS
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Mexicali
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Ciudad Juárez
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FLORIDA
PACIFIC OCEAN
ATLANTIC OCEAN
Gulf of California
San Antonio
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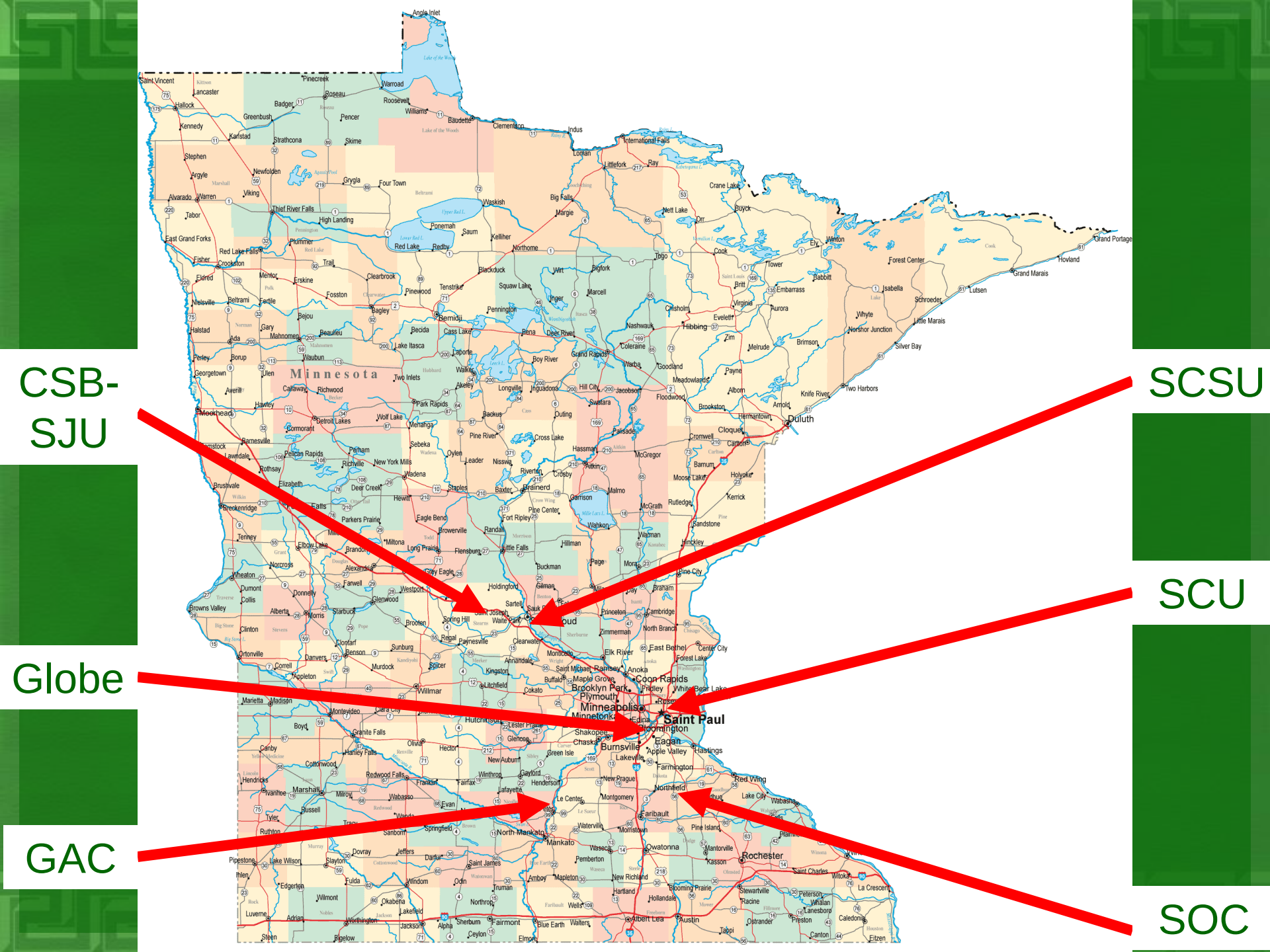
Culiacán
MEXICO
THE BAHAMAS
TROPIC OF CANCER
LA HABANA
Tampico
Mérida
Cancún
CUBA
Greater Antilles
Guadalajara
CIUDAD DE MEXICO
Santiago de Cuba
DOMINICAN REPUBLIC
HAITI
JAMAICA
KINGSTON
BELIZE
BELMOPAN
Acapulco
Alaska at 25%
ALASKA
ARCTIC CIRCLE
Anchorage
Hawaii (at the same scale)
Bering Sea
Gulf of Alaska
UNITED STATE


CSB-SJU
Globe
GAC
SCSU
SCU
SOC
Minnesota
Saint Paul
Minneapolis
Duluth
Rochester
Bemidji
Brainerd
Mankato
Willmar
Saint Cloud
Fergus Falls
Thief River Falls
Grand Portage
International Falls

College of St. Benedict-St. John's University (CSB-SJU)

Globe University Minnesota School of Business

Minnesota Intercollegiate Nursing Consortium (MINC)

Gustavus Adolphus College (GAC)

St. Olaf College (SOC)

St. Catherine University (SCU)

St. Cloud State University (SCSU)

KCMC

North Atlantic Ocean
South Atlantic Ocean
Indian Ocean
Indian Ocean
RUSSIA
KAZAKHSTAN
FRANCE
SPAIN
ITALY
TURKEY
IRAN
ALGERIA
LIBYA
EGYPT
SAUDI ARABIA
MAURITANIA
NIGER
MALI
CHAD
SUDAN
ETHIOPIA
SOMALIA
NIGERIA
KENYA
TANZANIA
ANGOLA
ZAMBIA
MOZAMBIQUE
MADAGASCAR
BOTSWANA
NAMIBIA
SOUTH AFRICA
Scale 1:51,400,000

Kilimanjaro Christian Medical University College (KCMUCo) Moshi, Tanzania

RESEARCH QUESTION

- What are student nurses' reported thinking processes during medication administration?

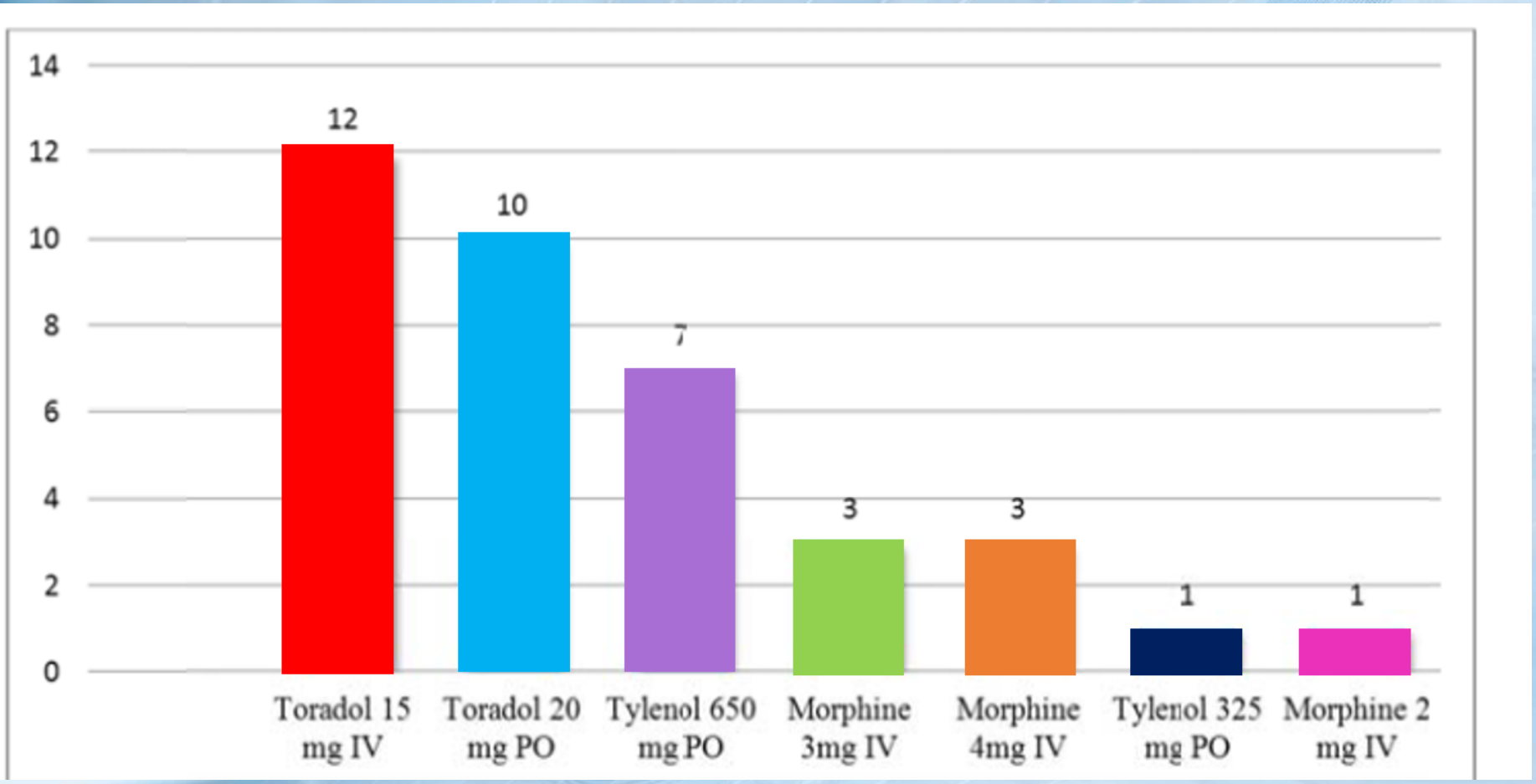
DESIGN/METHODOLOGY

- Research approved by IRB of each nursing program
- Descriptive, qualitative design
- Simulated clinical experience
- Semi-structured interview (audiotaped)
- Content analysis of statements, examination of themes & patterns

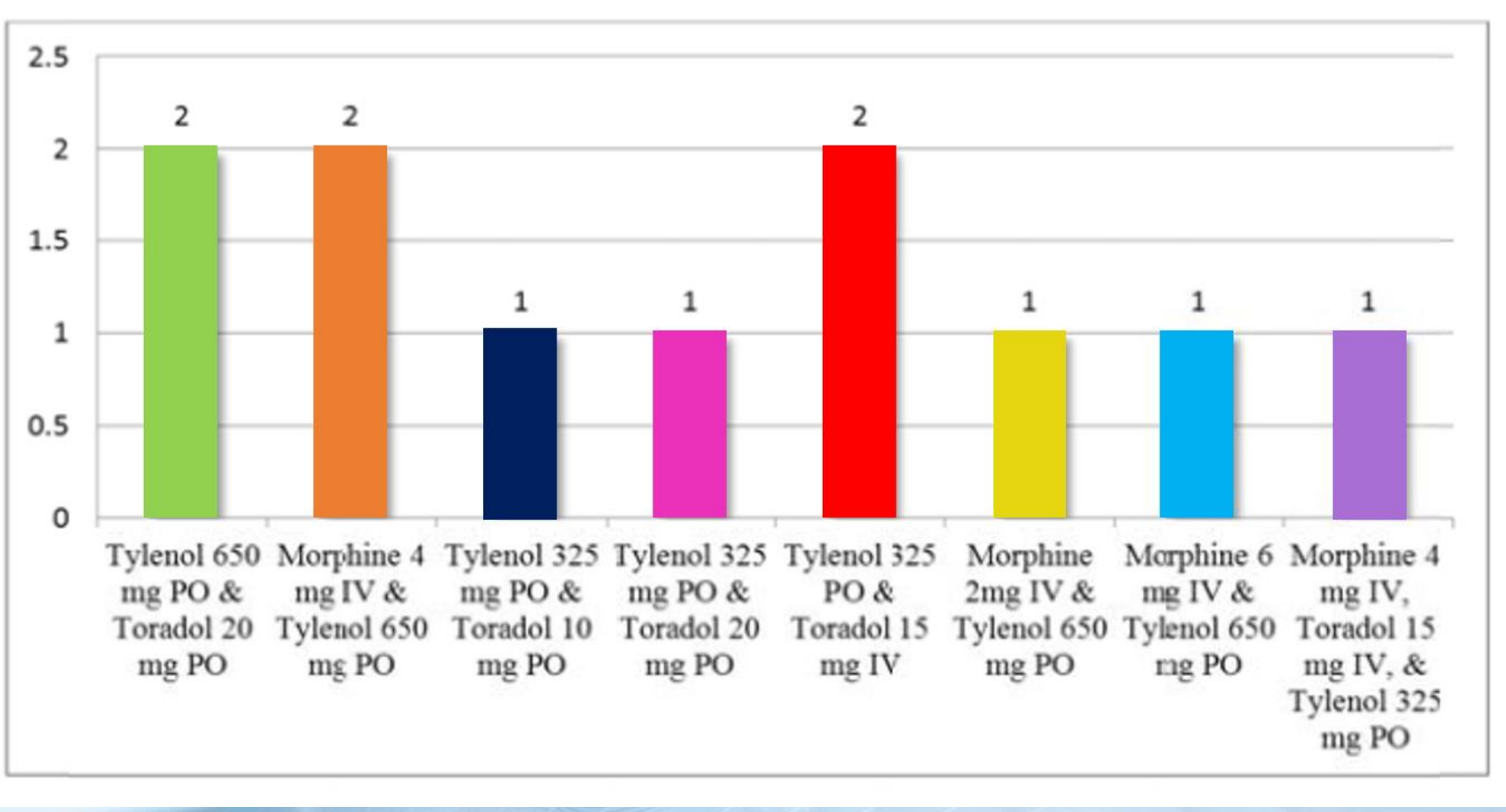
METHODOLOGY

- Subjects: 48 senior nursing students from 5 baccalaureate programs in Minnesota, USA (~10 students per program); ten 2nd year advanced diploma nursing students from KCMC in Moshi, Tanzania (Med-Surg content)
- Patient Role Player: 48-year-old female
- Postop Day 1: R. Total Hip Arthroplasty (MN)
  Trauma Day 3: 2nd degree burn R. thigh (TZ)
- Pain: 6 out of 10
- Decision: choices of PRN pain medication

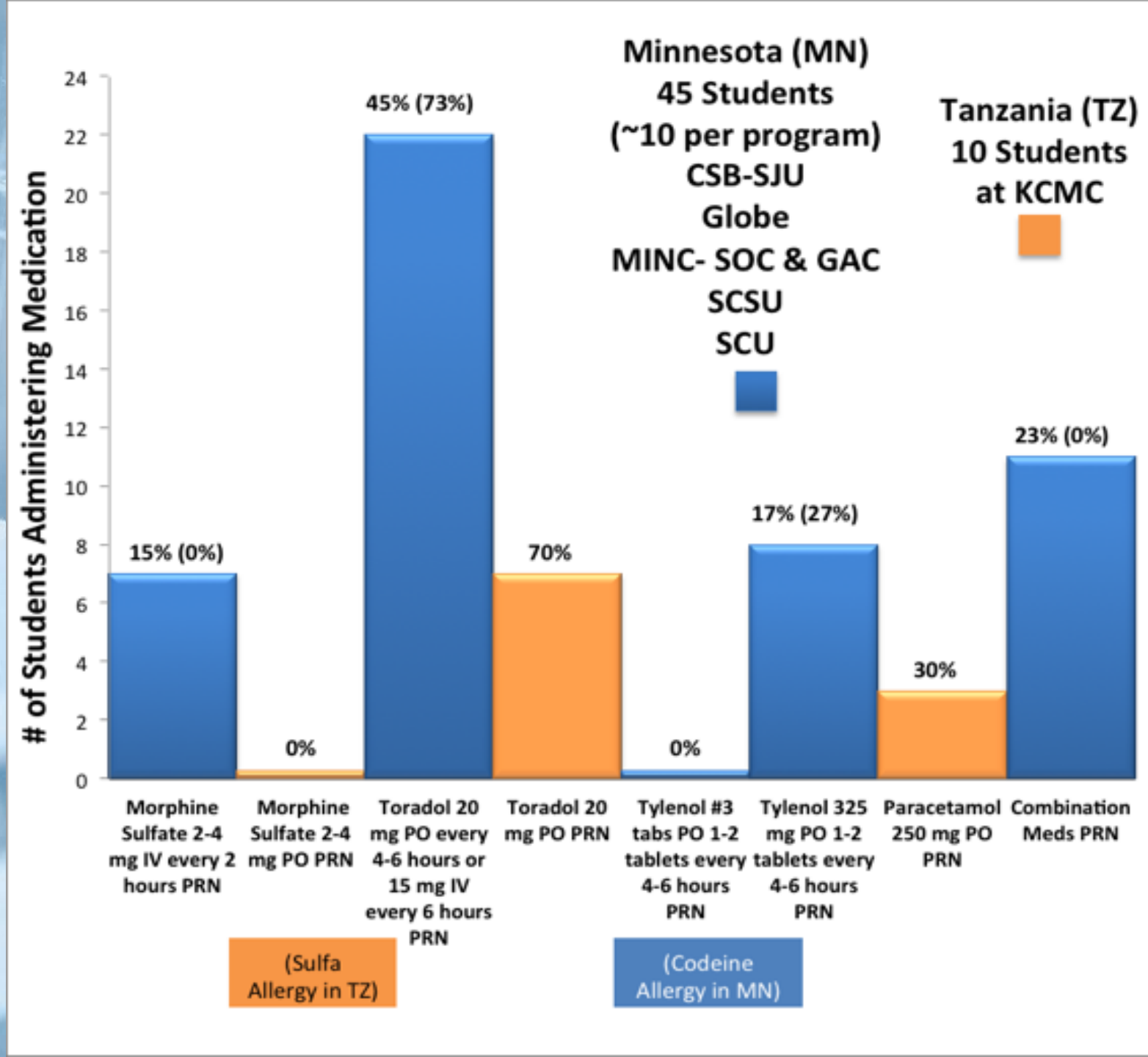
MN RESULTS
Single Medication Administered



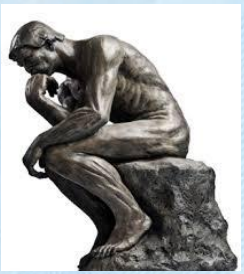
MN RESULTS
Multiple Medications Administered



MN vs. TZ


Minnesota (MN)
45 Students
(~10 per program)
CSB-SJU
Globe
MINC- SOC & GAC
SCSU
SCU
Tanzania (TZ)
10 Students
at KCMC
# of Students Administering Medication
0
2
4
6
8
10
12
14
16
18
20
22
24
15% (0%)
0%
45% (73%)
70%
0%
17% (27%)
30%
23% (0%)
Morphine Sulfate 2-4 mg IV every 2 hours PRN
Morphine Sulfate 2-4 mg PO PRN
Toradol 20 mg PO every 4-6 hours or 15 mg IV every 6 hours PRN
Toradol 20 mg PO PRN
Tylenol #3 tabs PO 1-2 tablets every 4-6 hours PRN
Tylenol 325 mg PO 1-2 tablets every 4-6 hours PRN
Paracetamol 250 mg PO PRN
Combination Meds PRN
(Sulfa Allergy in TZ)
(Codeine Allergy in MN)

Themes From Transcribed Student Interviews

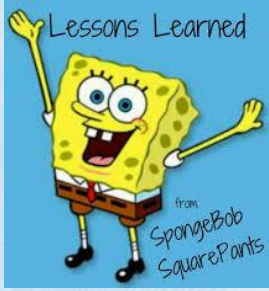


1. Safety- systematic preparation, checking rights, concerns about overmedication & addiction/tolerance, knowledge of medications, prevent errors

MN: "…making sure each step was followed, making sure to look up every single medication, making sure that the dosing was right, any possible side effects it may have, and double checking, triple checking, and quadruple checking everything."

TZ: "The doctor can do a lot of work and get tired, and give the wrong dose, so the doctor and the nurse share this information…so the patient is safe."

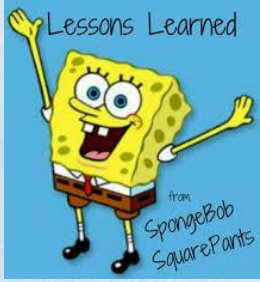
Themes From Transcribed Student Interviews



2. Clinical Reasoning- knowing rationale for meds, understanding the pain, using deductive reasoning to choose med(s), analyzing meds previously given, conferring with patient, desiring reduction in fever, other factors (sedation level*, bowel sounds*, language barrier**, ability to take pills, intake of food, presence of nausea, side effects, contraindications, administration procedure, familiarity with meds)

MN: “It helps me realize that there’s going to be several options and you need to weigh each option. And there might be more than one good answer or medication to give, but there’s one that will be more right.”

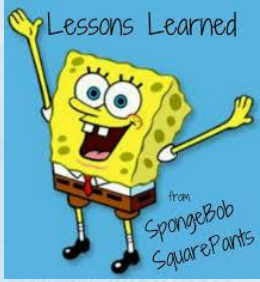
Clinical Reasoning



MN: “I chose to give the Toradol because the patient had a pain level of 6. I chose to give the Acetaminophen to combat the patient’s climbing fever. I chose not to give the Tylenol 3 due to the fact that the patient has codeine allergies. I chose not to give Morphine because of the respiratory status of the patient.”

TZ: “Toradol is good... is short-acting… and is very active in pain. This Paracetamol will help reducing temperature at the same time reducing pain, but it will take time… a bit. I didn't plan to give Morphine Sulfate because the mother is allergic to sulfa... that is why I didn't give.

Themes From Transcribed Student Interviews

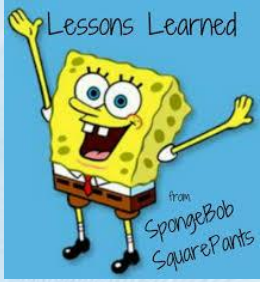


3. <u>Uncertainty & Need for Validation</u>- questioning self, decisions, & skill*, wanting more practice or experience, feelings ranging from anxiety to confidence**, desiring validation

MN: “Seeing that I am a new nurse, I would have wanted the second opinion of a colleague. So I would have double-checked with another nurse.”

TZ: “I was not sure about Toradol because my patient has temperature… how that would react. I was a bit nervous when I saw the patient, but then I was cool. Then cold when I was talking to my patient.. then I was giving her information and then I was okay.”

Themes From Transcribed Student Interviews



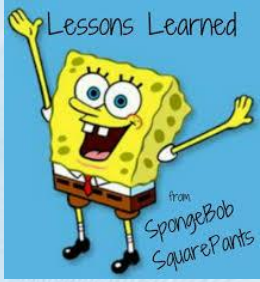
4. Perception of Realism- perceptions ranging from not seeming real to appearing real & scary, looking for hidden errors, wanting more information

MN: "If I had been in this situation for real life, you would have known the patient a little more...."

"The simulation feels real & the emotional experience of giving drugs & not being 100% sure is scary."

TZ: "I wanted time to do a family assessment, provide support for patient, provide hygiene. I'd like to find out about family system, teaching, marital status, economical status, assistance, etc. I would interview the patient, do a family history, & health history. I wanted to know more about the patient particulars."

Themes From Transcribed Student Interviews



5. Lessons Learned- learning from mistakes, needing more practice &/or experience, verifying orders, assessing effects of medication, collaborating with patients, evaluating patient reactions, reflecting on actions

MN: "I will have to think deeper about medications and the interactions of what's going on with the patient at the time…. My first thought would be to give her a pain med, but you have to look at the whole picture: respirations, allergies… a stomachache at the time… so I guess this just further proves that you need to think about each med administration and how it affects the person as a whole."

TZ: "This simulation is good. It helps me to remember my way to do right and to think about the patient. We have to work nearby with the doctors. We don't, "Yes sir! Yes sir!" We don't. We have to change. "Yes sir! Yes sir!" It is very bad... we have to say no…. We have to challenge."

Similarities for MN vs. TZ

- Themes- all 5 themes fit for MN & TZ
- Significance of pain rating at 6 r/t meds administered- 73% of students in MN gave Toradol & 70% in TZ; 27% in MN gave Acetaminophen & 30% in TZ (6 high level of pain vs. low)- those who did not give Toradol, stated it was because they were not familiar with it)
- Analysis of options- a deductive cognitive process of ruling meds “in” or “out”
- More time/Do more- for assessments & education
- Concern about safety- highest with med administration

Variations for MN vs. TZ

- Difference in multiple pain medications- 23% of students in MN gave a combination of pain medications; 0 in TZ (not considered)
- Only 1 TZ student had good internet for preparation
- TZ nursing students were surprised that patient had 2 diagnoses & concerned about control of DM through diet & meds/risk of infection due to 2° burn
- TZ students wanted more information about the patient's health and social history*
- Maintaining good relationships was important in TZ**

STUDY LIMITATIONS

- Varied curricular content, clinical experiences, learning resources, timing, newness of simulation (culture, language barrier)
- Difficulty of recall
  - Multi-tasking, fast-paced simulation
  - No follow-up questions asked
  - Emotional component
- Triangulation helped assure validity and enhance rigor in MN study*

IMPLICATIONS AND CONCLUSIONS

- Clinical decision-making needs to include best practices, individual experiences, patient condition, patient preferences, etc.
- Simulation & clinical with debriefing for reflection to uncover the rationale behind actions is needed to provide more clinical reasoning opportunities
- Continued focus is needed on student thinking with medication administration

COMMENTS/INSIGHTS:

- Taking notes was important to fully capture comments if audiotape was not clear; video analysis may help
- Verbal debriefing vs. students writing responses may have forced students to respond
- If students made multiple similar comments within questions, they were recorded once*
- Debriefers did not request further clarification of answers to questions or ensure that students thoroughly thought through their responses**

COMMENTS/INSIGHTS:

- Faculty wondered what information we missed (i.e., what information did students forget or not tell us?)
- Debriefing incorporates context, reflection & dialogue for a dynamic process of critical inquiry- there is also an emotional/affective dimension that may need to be addressed following simulation
- Simulations with many decision pathways encourage students to prioritize & support their decisions while introducing them to the complex thinking necessary for effective clinical decision-making
- This was a simulation vs. real clinical practice- what is the difference in thinking between these?

PUBLICATION

Simones, J., Neal, D.O., Schug, V., Blazovich, L. M., Pivec, C., Daniels, J., Becker, M. K., Schulenberg, C., Lehman, S. M., Ohman, K., Swiggum, P., & Keller, P. (2014). Student nurses' reported thinking during medication administration. *Journal of Nursing Education and Practice, 4*(11), 136-146.

Using Virtual Simulation to Enhance Student Learning: A Case-Based Approach

Dr. Jone Tiffany

Objectives

- Discuss the use of virtual role-play simulation to increase cultural sensitivity in healthcare professionals.
- Examine future implications for the educational uses of virtual world environments for healthcare professionals.

Jone

Zelda

“Ugly in a World Where You Can Choose to be Beautiful”:Teaching and Learning About Diversity via Virtual Worlds

Inclusivity Assignment

Field Study Experience Objectives: 1. Describe the nature of values and value systems and their influence on behavior applied in a variety of settings. 2. Identify personal and professional values that influence the decision-making process when interacting with diverse clients and students. 3. Synthesize the literature and the SL field study experience into an action plan for how to ensure inclusivity in nursing practice and education. **Note:** Nurse educator students in this course have had significant readings and class discussions regarding inclusivity prior to participating in this culminating course activity. This experience is preceded by an orientation to Second Life® using online tutorials and a face-to-face classroom session. The avatars used in this field study experience were created specifically for this assignment.	
Part I: Meet Your Avatar	A photo and biography of an avatar representing a marginalized person is provided to each student. Upon meeting your assigned avatar, write a 2-3 page reflection paper that addresses the following questions: 1. How do you feel about being assigned this avatar? 2. What are your initial reactions after reviewing this avatar's photo and biography? 3. What are your isms or biases with regards to people who reflect this avatar?
Part II: Virtual Field Study Activities	You have been provided with a variety of social networking site landmarks in SL that are outside of Nightingale Isle. Sign into SL as your assigned avatar and go into these sites acting as if you are this person. You may not change the assigned avatar in any way. You are not to divulge that you are a student engaging in a project. Plan on spending at least ten hours in SL.
Part III: Synthesis Paper	Upon completion of the activities within SL, write a 4-5 page paper incorporating the following: 1. What attitudes, biases, and isms did you bring with you into the sites you visited as your assigned avatar? How did this affect your interactions with other avatars in SL? 2. How were you treated by other avatars in SL? How did you feel about that? 3. If you had been able to change your assigned avatar before visiting SL social networking sites, what changes would you have made to increase your level of comfort? 4. Integrating course concepts and personal lessons learned during this assignment, explain how you might use and apply this knowledge in the nurse educator role. 5. How do you anticipate your nursing practice will change after completing this field experience and course?
Part IV: Class Presentation	Prepare a 3 slide presentation on your experiences in SL that integrates related course concepts. Include 1) a summary of your experience in SL; 2) integration of the SL field study experience with course readings and discussion; and 3) a discussion of how you will use what you have learned to create an inclusive nursing education environment (give specific examples). These slides will be presented during the last night of class.

Figure 3 Inclusivity field study experience in Second Life®.

Examples of Diverse Avatars that can be purchased in SL marketplace.

Lacey Tigerauge

Abukar Kariunga

Cody Wheelwright

Javan Soulstar

Deepa Islar

Destiny Endersleigh

Louie Macalroy

Lottie Botside

Jenice Brunsen

Ned Horsley

Manderson Dexler

Susan Taselian

ROLE PLAY SIMULATION STORIES

As the students ventured out into the virtual world of Second Life, they took the avatar stories with them and played them out with other avatars they met. As the stories became more and more real to the students, they elicited some interesting responses.

Abukar Kariunga

"Being treated like this in real life would have a negative impact on how I viewed myself."

"I still bring my own personality to my avatar - A bit of projection?"

"I was nervously excited to get started."

"My fear of others thinking I was a terrorist might have been my own bias."

"Other Avatars wouldn't come close to me."

"I think I have a better idea of what being a minority is like."

Cody Wheelwright

"How I thought I would be treated affected the way I interacted with others."

"Other Avatars wouldn't come close to me."

"If I had a choice I would lose the wheelchair."

"I found my inner voice.. I felt empowered to do things I wouldn't do in real life."

"Through this I gained an appreciation for my biases and prejudices."

"Homophobia .. Why were other male avatars afraid I was hitting on them?"

Deepa Islar

"I thought since I was a millennial I would love this…..I didn't."

"Doing this assignment made me realize that I have biases about certain age groups that are not true."

"I encountered the micro-aggression of disability blindness."

"I found I judged people because of their appearance..that surprised me."

"People learn in different ways, and it is important to include a variety of techniques."

Destiny Endersleigh

"I thought since I was a millennial I would love this…..I didn't."

"Other avatars made rude comments about my clothes asking me if I got them at a thrift shop?"

"I would have been more comfortable if I looked like myself."

"After completing this assignment, I have noticed the lack of inclusivity in my place of work."

" When I was at the beach I was told that I wouldn't get any darker if I sat in the sun. "

Javan Soulstar

"I didn't interact with others because I was afraid how they would react to me."

"I projected my own biases on my avatar. I thought people who think badly of me because of how I looked."

"I didn't want the homeless avatar to hang out with me."

Lottie Botside

"When I encountered other avatars in my travels, they ignored me and moved away from me."

"I thought other avatars would judge me because of my size. So, I stayed to the outside of the social places."

"If I had a choice I would have made my avatar slimmer."

"Initially, I was worried I would project my feelings of insecurity on my avatar."

Mildred Poggel

"I was confident that my avatar would be an outcast and be ignored."

"Other avatars didn't understand why I would choose to be old when I could be young and beautiful."

"When I met my avatar I was mortified. I didn't want to be an old woman."

Ned Horsley

"At first I was nervous to play a homeless person. I was amazed at how some people reacted to my avatar."

"As a virtual person, you can create all of your attributes and even your personality to some extent."

"I found that he was either ignored/taunted or pitied."

"Why would I want to be a homeless man when I could choose to be anyone out in Second Life."

"One avatar listened intently to my story, and then offered support, money, and words of wisdom."

Publications About This Research

Clinical Simulation in Nursing (2014) 10, e19-e24

ELSEVIER

Clinical Simulation in Nursing

www.elsevier.com/locate/ecsn

Featured Article

Teaching/Learning in Second Life: Perspectives of Future Nurse-Educators

Jone Tiffany, DNP, RNC*, Barbara A. Hoglund, EdD, FNP-C

Bethel University, Department of Nursing, St. Paul, MN 55112, USA

KEYWORDS
Second Life;
online virtual world;
virtual reality;
avatar;
simulation;
nurse-educator;
nursing education;
innovative teaching/learning strategies;
teaching/learning;
computer self-efficacy

Abstract

Background: Innovative teaching/learning strategies that simulate real world situations are needed. The virtual world of Second Life (SL) provides an opportunity for nurse-educators to develop meaningful, simulated learning experiences that are transferrable to the real world of nursing practice.

Methods: Students enrolled in a graduate nursing education course were invited to complete pre- and post-activity surveys regarding perceptions and experiences related to using SL as a teaching/learning strategy.

Results: The simulated role play experience in SL helped 10 of 11 students to apply concepts regarding the lived experience of marginalized persons. Seven described a meaningful learning experience; 11 reported a sense of presence and connectedness. Barriers and challenges related to technology, self-efficacy, and communication within the virtual world were identified.

Conclusion: With careful planning, the use of SL as an innovative teaching/learning strategy for nursing education was validated.

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Nurse-educators are facing unparalleled challenges to address the changing demographics and learning styles of today's learners and the ever evolving, complex requirements of the practice environment. In addition, many of today's traditional-aged college students have been raised in a multicultural, multiethnic, global world. This generation has grown up with technology in all areas of life: Communication, music, entertainment, and education (Benner, Sutphen, Leonard, & Day, 2010; Billings, 2007). These factors, coupled with the knowledge explosion and complexity of new information technologies, have nurse-educators reevaluating the relevance of current teaching strategies. Innovative educational strategies are needed to better prepare nurses to succeed in complex health care environments where quality and safety are paramount.

Virtual reality software and environments such as Second Life (SL, Linden Labs, San Francisco, CA) hold potential as part of the solution by providing an innovative and interactive platform for educational experiences that simulate real-world situations. This platform offers opportunities to utilize the virtual world to expose nursing students to learning in a new way. The purpose of this small, exploratory study was to trial the use of SL with graduate nurse-educator students, and to obtain insight regarding this innovative teaching/learning methodology.

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Featured Article

Using Virtual Simulation to Teach Inclusivity: A Case Study

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KEYWORDS
simulation;
virtual reality simulation;
Second Life®;
avatar;
inclusivity;
diversity;
cultural awareness;
nursing education;
innovative teaching/learning strategies;
role-play

Abstract

Background: The topics of inclusivity, diversity, and cultural awareness are difficult to adequately explore in a traditional classroom setting. The use of the virtual platform of Second Life® afforded a unique opportunity to use virtual role-play simulation to experience what it is like to walk in another's shoes.

Method: Fifteen graduate nurse educator students enrolled in a course titled "Inclusivity in Nursing Education" were randomly assigned a customized avatar, representing a marginalized person for use in a role-play simulation in the virtual world of Second Life®. Two written assignments regarding the learning experience were evaluated using a simple qualitative analysis.

Results: Students indicated that they increased their own capacity to understand, appreciate, and relate to people different from themselves.

Conclusion: Although future research is needed to determine the full extent to which virtual platforms can be used effectively in nursing education, this case study demonstrated that valuable learning regarding complex topics can take place in the virtual world.

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To facilitate safe and effective nursing practice, nurse educators strive to develop curriculum that facilitates an appreciation and understanding of diversity and helps nursing students learn to understand patient cultural frames of reference as filtered by their own lens (Pyburn & Bauman, 2013). Because inclusivity and cultural competency are difficult topics to address in the classroom and nursing students have varied clinical experiences that expose them to these concepts, an innovative approach to address these concerns was needed. This article describes the use of Second Life® (SL) as an interactive learning environment and how SL facilitated graduate nursing student exploration of concepts related to cultural awareness, inclusivity, diversity, personal bias, and—isms as related to the practice of nursing. The results of simple, qualitative thematic analysis of two written student assignments are presented.

Theoretical Underpinnings

Nursing education is moving from traditional pedagogies to the use of constructivist pedagogy, which shifts the role of

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