The Use of Simulation for Pre-Service Education of Midwives in Zambia

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Innovating teaching is important

- The scarcity of providers and the substandard care at maternity centers have become disincentives for women to use skilled birth attendants (SBAs) (Koblinsky, Mathers, Hussein, Mavakankker, Mridha, Anwar et.al. 2006).
- There is a lack of faculty to train midwives in the clinical setting
Simulation

- Simulation has been introduced in developed countries as one method to ensure that students gain confidence and knowledge prior to entering the clinical environment (Shinnick, Woo, & Mentes, 2011).

- Simulation based learning ranges from the use of student role models, hybrid models, to high fidelity simulators which provide a physiological response to a student’s action (Decker, Sportsman, Puetz, and Billings, 2008).

- Systematic reviews of simulation based learning in nursing and medical education have surmised that simulation may have an advantage over other teaching methods depending on the topic, context and methods employed (Cant & Cooper, 2009; Shinnick, Woo, & Mentes, 2011).
Innovative methods are being used globally (Sudan, Portugal, Mexico, Bangladesh, Armenia)

Most often to improve response to emergency situations that require not only skill, but communication and coordination of interdisciplinary teams (Crofts, Bartlett, Elise, Hunt, Fox, & Draycott, 2006; Birch et al., 2007; Fahey & Mighty, 2008)

Sim is used for 17% of midwifery education in Australia (Borgossina et al. 2011)
Our team

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Consultants:

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The Study

- **Purpose:** Introduce the use of simulation to the faculty and students, assess knowledge gain related to the addition of a simulation intervention and the difference between groups on confidence and satisfaction with learning.

- **Design:** Quasi experimental design using a pre-test - post test measure related to participation in simulation classes or receiving standard clinical instruction.

- **Subjects and setting:** Midwifery students attending UTH SOM Lusaka Zambia. 41 students were eligible, 37 enrolled and 34 completed all measures.
Theoretical Framework

Diffusion of Innovation (DOI) for faculty development.

› DOI proposes the manner in which new technology is adapted progresses through five phases (Rogers, 2003)

Novice to Expert for student development.

› Skills acquisition, the passing through phases of obtaining five levels of proficiency; novice, advanced beginner, competent, proficient, and expert (Benner, 1984)
<table>
<thead>
<tr>
<th>Scenario Algorithm</th>
<th>Learning Objectives</th>
<th>Scenario Background</th>
<th>Scenario Scene: simulator as client</th>
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</thead>
<tbody>
<tr>
<td>- Initial assessment of labor</td>
<td>The student will:</td>
<td>Patient is brought to her local health center by her mother and presents for evaluation of labor. This is her second pregnancy. One living child. It is now 1200hrs. Chief complaints: lower abdominal pain and back ache. Simulator supports: Antenatal card.</td>
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<tr>
<td>o Ask the questions in order for assessment.</td>
<td>- Ask problem based history questions</td>
<td></td>
<td>1. Student support (answers)</td>
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<td>o Carry out the examination in order.</td>
<td>- Identify s/s of labor</td>
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<td>2. Student interviewer</td>
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<td>o Educate the mother</td>
<td>- Demonstrate critical thinking to assess women’s general condition and labor status</td>
<td></td>
<td>3. Student examination</td>
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<td>- Labor progressed to spontaneous rupture of membranes.</td>
<td>- Respond to patient’s complaints of labor</td>
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<td>4. (2)Student educator</td>
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<tr>
<td></td>
<td>- Initiate education with client.</td>
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<td>5. (2)Student scribe</td>
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<td></td>
<td>Critical Actions</td>
<td></td>
<td>6. Student relative</td>
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<td></td>
<td>- Interview and Assess</td>
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<td>- Monitor vital signs</td>
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<td>Faculty supports scenario and conducts debriefing.</td>
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Procedures

 Internal Review and all participants consented
 Standard didactic education
 Pre test on 3 measures
   › Knowledge gain
   › Self confidence
   › Student satisfaction
 Intervention
   › Group 1: simulation and standard clinical
   › Group 2: standard clinical
 Post test on 3 measures
**Instruments**

- *Knowledge Gain*. Researcher developed in response to scenarios with predefined elements to response. 10 items Range (0-38)

- *Student Satisfaction and Self Confidence in Learning Scale (SSSL)* 13 items. Range (13-65) (Jeffries & Rizzolo, 2006)
  - student satisfaction (five items)
  - self confidence in learning (eight items)
Results

- There were no significant differences between the pre and post test scores between groups. Pre test scores of knowledge gain ranged from 7-22 overall with a mean of 15.22 (SD = 3.41). Post test scores ranged from 3-22, with a mean of 14.26 (SD = 3.53).

- The Simulation Clinical Group (intervention) achieved greater confidence and satisfaction with learning scores ($M = 57.47$, $SD = 3.55$) than the Standard Clinical Group ($M = 52.88$, $SD = 7.37$). $t(23.06) = 2.31$, $p = .03$

- Only 14.3% of the SSSL variance was accounted for by whether a student was assigned to the Simulation or Standard Clinical Group.
Discussion

- Knowledge overall was low
  - Testing methods are not comparable
  - Students scored better on gathering data.
  - They scored low on prioritization and applying knowledge.

- Confidence was moderate overall
  - Students are eager

- Satisfaction differed between groups
  - Related to simulation or engagement with faculty
  - How does this transfer to the clinical environment?
Teaching outcomes

- Study served as an introduction!
  Implementing sim in curriculum requires systematic pre-work with faculty

- Results support the need to tend to Cognitive Load Theory
  - Intrinsic use of working memory is taxing
  - Simulation is full of extraneous elements
  - Developing schematic memory using this innovation will take time.
Future Implications

- Education of faculty
- Introduction of use of all methods of simulation with students
- Mutuality with the clinical teaching environment. Engage the practicing midwives as part of the program.
- Link observable outcomes in the clinical setting to the practice of simulation.
Questions

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Thank you