Motivation to Access Laparoscopic Skills Training by Obstetrics and Gynaecology Residents: A Novel Tool to Characterize Motivation

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Disclosures

• We have no conflicts of interest to disclose
Background

• Minimally invasive surgery (MIS) requires residents to acquire a unique set of surgical skills

• How do We Teach it?
  • Apprenticeship ➔ Simulation

• Introduction of Competency Based Medical Education (CBME)
  • Foster skill development and mastery in simulation setting

Sanders et al. 2015
Chang et al 2007
What motivates residents to access laparoscopic simulation?
Objectives

• To characterize factors that motivate OB/Gyn residents to seek laparoscopic simulation experience outside of the formal curriculum

• Pilot project to evaluate questionnaire
A Framework for Studying Motivation

- Expectancy Value Theory

- Proposed by Eccles and Wigfield in 1995
  - A model to describe motivation to learn math amongst school-aged children
  - Now used in many education contexts including adult education

Eccles and Wigfield 1995
Gorges and Kander 2012
Expectancy Value Theory

Motivation

Expectancy
- Intrinsic Value
- Attainment Value
- Extrinsic Value

Value

Cost

Upstream Motivators
Methods

**Questionnaire Development**
A questionnaire grounded in Expectancy Value theory was adapted to the surgical resident context.

**Questionnaire Administration**
All Dalhousie Ob/Gyn Residents eligible to participate (N=23)

**Response Analysis**
Cronbach’s alpha used to assess internal reliability of scales.

**Focus Group**
Scales assessed for face and content validity.

**Future Study**
Revised questionnaire to be administered to Canadian Ob/Gyn residents.
Research Ethics

- This study received ethics approval from the IWK REB (#1021364)
Results

• 15 residents completed the questionnaire (65 % response rate)
• Four residents participated in the focus group
## Demographic Data

<table>
<thead>
<tr>
<th></th>
<th>PGY</th>
<th>Age</th>
<th>Gender</th>
<th>Plan to perform laparoscopic surgery as staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PGY</td>
<td>1-2: 40% (6)</td>
<td>3-5: 60% (9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>&lt;25: 7% (1)</td>
<td>26-30: 67% (10)</td>
<td>31-35: 20% (3)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Female: 80% (12)</td>
<td>Male: 20% (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan to perform laparoscopic surgery as staff</td>
<td>Yes: 93% (14)</td>
<td>Undecided: 7% (1)</td>
<td>No: 0% (0)</td>
<td></td>
</tr>
</tbody>
</table>
## Internal Reliability of Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of Items</th>
<th>Chronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Value, Simulation</td>
<td>4</td>
<td>0.933</td>
</tr>
<tr>
<td>Interest Value, Operating Room</td>
<td>4</td>
<td>0.936</td>
</tr>
<tr>
<td>Attainment Value</td>
<td>6</td>
<td>0.749</td>
</tr>
<tr>
<td>Utility Value</td>
<td>5</td>
<td>0.332</td>
</tr>
<tr>
<td>Utility Value, revised</td>
<td>3</td>
<td>0.693</td>
</tr>
<tr>
<td>Ability</td>
<td>5</td>
<td>0.874</td>
</tr>
<tr>
<td>Ability, revised</td>
<td>4</td>
<td>0.902</td>
</tr>
<tr>
<td>Task Difficulty</td>
<td>3</td>
<td>0.889</td>
</tr>
<tr>
<td>Effort Cost</td>
<td>4</td>
<td>0.409</td>
</tr>
<tr>
<td>Effort Cost, revised</td>
<td>3</td>
<td>0.643</td>
</tr>
<tr>
<td>Opportunity Cost</td>
<td>5</td>
<td>0.895</td>
</tr>
</tbody>
</table>
## Self-Reported Simulation Use

<table>
<thead>
<tr>
<th>Hours per Week</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>67% (10)</td>
</tr>
<tr>
<td>1-5</td>
<td>33% (5)</td>
</tr>
</tbody>
</table>
Focus Group

- Theme of self-doubt around ability to master laparoscopic skills

- Potential modifying variable:
  - Residents question whether laparoscopic simulation promotes development of a skill set that is transferable to the operating room
Revised Questionnaire

• Revised scales to improve Crohnbach’s alpha

• Frame of reference
  ◦ Branching
  ◦ Simulation vs. MIS

• Expanded Scales to address:
  ◦ Self efficacy
  ◦ Cost
Discussion

- Piloted a novel questionnaire
  - Established face and content validity
  - Reliability analysis and focus group feedback to improve questionnaire

- Identified a modifying variable
  - Residents question whether laparoscopic simulation promotes development of a skill set that is transferable to the operating room
Strengths and Limitations

- **Strengths**
  - Grounded in an established educational psychology theory
  - Produced a stronger tool for future study

- **Limitations**
  - Small, single site study
  - Selection bias
  - Response rate

Burns et al. 2008
Future Directions

• Study of Canadian Ob/Gyn residents to characterize motivation to access laparoscopic simulation

• Inform simulation curricula to effectively facilitate mastery
Acknowledgements

• Funding provided by the HB Atlee Endowment Fund

• Ob/Gyn Residents at Dalhousie University who participated in the study

• Steve Morley for assistance with the Opinio survey creation platform
Questions?
References


Reference Slides
Inclusion/Exclusion Criteria

- **Inclusion Criteria**
  - OB/Gyn residents in PGY 1-5

- **Exclusion Criteria:**
  - Residents not engaged in clinical duties during the study period
  - Principal Investigator
## Factors Influencing Access to Simulation

<table>
<thead>
<tr>
<th></th>
<th>Not Important (1-2)</th>
<th>Somewhat Important (3)</th>
<th>Important or Very Important (4-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill development</td>
<td>7% (1)</td>
<td>93% (14)</td>
<td></td>
</tr>
<tr>
<td>Interest in laparoscopic surgery</td>
<td>13% (2)</td>
<td>13% (2)</td>
<td>73% (11)</td>
</tr>
<tr>
<td>Mandatory or protected time</td>
<td>20% (3)</td>
<td>33% (5)</td>
<td>47% (7)</td>
</tr>
<tr>
<td>Practice before a case</td>
<td>20% (3)</td>
<td>33% (5)</td>
<td>47% (7)</td>
</tr>
<tr>
<td>Requirement for a rotation</td>
<td>7% (1)</td>
<td>20% (3)</td>
<td>73% (11)</td>
</tr>
<tr>
<td>Recommendation of an attending surgeon</td>
<td>7% (1)</td>
<td>20% (3)</td>
<td>73% (11)</td>
</tr>
<tr>
<td>Proximity to the skills lab</td>
<td></td>
<td>20% (3)</td>
<td>80% (12)</td>
</tr>
<tr>
<td>Free time</td>
<td></td>
<td>13% (2)</td>
<td>87% (13)</td>
</tr>
<tr>
<td>Peer pressure</td>
<td>53% (8)</td>
<td>47% (7)</td>
<td></td>
</tr>
</tbody>
</table>
# Timing of Laparoscopic Simulation Use

<table>
<thead>
<tr>
<th>Timing</th>
<th>Proportion of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>During Work Hours</td>
<td>67% (10)</td>
</tr>
<tr>
<td>Post Call</td>
<td>13% (2)</td>
</tr>
<tr>
<td>Off Duty/Vacation</td>
<td>53% (8)</td>
</tr>
<tr>
<td>Other</td>
<td>20% (3)</td>
</tr>
</tbody>
</table>
## Barriers to Access

<table>
<thead>
<tr>
<th></th>
<th>Proportion of respondents who identified this barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>93% (14)</td>
</tr>
<tr>
<td>Proximity to simulation lab</td>
<td>33% (5)</td>
</tr>
</tbody>
</table>
To me, proficiency in Minimally Invasive Surgery is:
Not an asset to my career A large asset to my career
1 2 3 4 5

How important is being proficient in Minimally Invasive Surgery to finding desired employment after residency?
Not important Very important
1 2 3 4 5

How useful is learning Minimally Invasive Surgery to your career goals?
Not useful Very useful
1 2 3 4 5

How useful are laparoscopic simulation exercises to performing Minimally Invasive Surgeries?
Not useful Very useful
1 2 3 4 5

How transferable are laparoscopic simulation skills to the operating room?
Not at all transferrable Very transferrable
1 2 3 4 5
Scale Revision Example: Extrinsic Utility Value

To me, proficiency in Minimally Invasive Surgery is:
Not an asset to my career  A large asset to my career
1                      2                      3                      4                      5

How important is being proficient in Minimally Invasive Surgery to finding desired employment after residency?
Not important  Very important
1                      2                      3                      4                      5

How useful is learning Minimally Invasive Surgery to your career goals?
Not useful  Very useful
1                      2                      3                      4                      5

How useful are laparoscopic simulation exercises to performing Minimally Invasive Surgeries?
Not useful  Very useful
1                      2                      3                      4                      5

How transferable are laparoscopic simulation skills to the operating room?
Not at all transferrable  Very transferrable
1                      2                      3                      4                      5
Revised Scales: Ability/Expectancy

- Subjective beliefs about how s/he will perform on a task
- Crohnbach’s Alpha:
  - All scales: 0.874
  - Revised scales: 0.902
Revised Scales: Ability/Expectancy

“How good at performing minimally invasive surgery are you?”
Not at all good 1 2 3 4 5
Very good

“I am confident that I can learn the skills to become good at minimally invasive surgery”
Not at all confident 1 2 3 4 5
Very confident

“I am confident that I can independently perform a total laparoscopic hysterectomy safely”
Not at all confident 1 2 3 4 5
Very confident

Klassen, Krawchuk, and Rajani 2008
Modifying Variable: Simulation vs MIS

- **Intrinsic Value:** the enjoyment derived from performing a task
- **Cronbach’s alpha:**
  - Simulation: 0.933
  - MIS: 0.936

“In general, I find performing laparoscopic simulation exercises”

| Very boring (1) | 2 | 3 | Very interesting (4) | 5 |

“How much do you enjoy performing minimally invasive surgery?”

| Not very much (1) | 2 | 3 | Very much (4) | 5 |
Revised Scales: Modifying Variable

• Extrinsic value: the perceived usefulness of a task to future goals

• Cronbach’s alpha:
  • All scales: 0.332
  • Revised scales: 0.693

How useful are laparoscopic simulation exercises to performing minimally invasive surgeries?

<table>
<thead>
<tr>
<th>Not useful</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very useful</th>
</tr>
</thead>
</table>

To me, strong minimally invasive surgical skills are:

<table>
<thead>
<tr>
<th>Not valuable after residency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Very valuable after residency</th>
</tr>
</thead>
</table>
Revised Scales: Attainment Value

- The self-defined importance of succeeding in a task
- Crohnbach’s Alpha: 0.749
- Reference to OSATS was eliminated
  - Revised referent: MIS

I feel that, to me, being someone who is good at minimally invasive surgery is

Not important | 1 | 2 | 3 | 4 | Very Important | 5
Revised Scales: Cost

Cost
What is invested, required, or given up to engage in a task

Task Difficulty Cost
Perceived difficulty of the task

Effort Cost
Effort required to perform the task

Opportunity Cost
Sacrifices made to perform the task

Flake et al. 2015
Revised Scales: Cost

Cost

Task Difficulty Cost
Task Effort Cost
  Time/effort/work required to engage in the task
  Referent = Simulation
Outside Effort Cost
  Time/effort/work required for other tasks
  Referent = Simulation
Loss of Valued Alternatives
  What is given up to engage in the task
  Referent = Simulation
Emotional Cost
  Psychological state that results in engagement in the task
  Referent = Simulation AND MIS

Flake et al. 2015