Comparing the Health Belief Model and Theory of Planned Behavior in Predicting Intention to Vaccinate Against the Human Papillomavirus in College-Age Women

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HPV: Prevalence and Vaccine

- Dunne et al. (2007) article in JAMA:
  - Prevalence data for women
    - Overall between the ages of 14 and 59: 26.8%
    - Between the ages of 14 and 19: 24.5%
    - Between the ages of 20 and 24: 44.8%
    - Between the ages of 25 and 29: 27.4%

- HPV vaccine (Gardasil®):
  - FDA approved it for females between the ages of 9 and 26
  - Protects against low-risk (6 and 11) and high-risk (16 and 18) strains
**HPV among College-Age Women**

- **Vaccine efficacy:**
  - 95% to 100% without prior exposure to HPV
  - Highest before any sexual experience
    - Thus, public health messages target young, pre-sexual girls
  - Declines with sexual experience (i.e., assumed exposure to strains of HPV)

- **Why study college-age women?**
  - High prevalence rates
  - Even with exposure to one strain, vaccine may protect against others
  - Opportunities to decrease incidence rates
Health Decision-Making

- **Theory of Planned Behavior (TPB):**
  - Attitude toward vaccination
  - Subjective norms
  - Perceived behavioral control

- **Health Belief Model (HBM):**
  - Perceived susceptibility
  - Perceived severity
  - Benefits
  - Barriers
  - Self-efficacy
  - Knowledge
  - Cues to action
Purpose

- Which of the TPB variables significantly predicts intention to vaccinate against HPV?

- Which of the HBM variables significantly predicts intention to vaccinate against HPV?

- Can an integrative model (of variables from the TPB and the HMB) be developed to capture the most important determinants of intention to vaccinate against HPV?
Participants

- 143 non-vaccinated female college students
- Ages ranged from 18 to 39 ($M = 21.76$, $SD = 3.32$)
- 80% Caucasian
- 86% reported having sexual intercourse at least once
  - Mean age of first intercourse = 16.63 ($SD = 1.87$)
  - Mean number of lifetime partners = 5.04 ($SD = 6.55$)
  - 53% used a condom with last new sexual partner
- 75% were dating or partnered
Questionnaire

• **Control variables:**
  • Smoking status
  • Number of lifetime sexual partners
  • Sexual risk factors
    • E.g., age of first experience, oral sex, condom used with last new partner, diagnosis of an STI, abnormal PAP test

• **Predictor variables:**
  • TPB variables (total of 3)
  • HBM variables (total of 7)

• **Outcome variable:**
  • Intention to vaccinate
Results: Descriptive Statistics

• Intention to vaccinate:
  • Mean = 10.68 (SD = 3.53)
    • Scores range from 4 (very unlikely) to 16 (very likely)

• Knowledge of HPV:
  • 17 true/false items; Mean = 68% answered correctly
  • Troublesome items about the effects of HPV:
    • 48.3% incorrectly believed:
      • “All women with certain types of HPV will develop cervical cancer unless they receive treatment.”
    • 39.2% incorrectly believed:
      • “Most women with HPV have abnormal menstrual periods.”
Results: Descriptive Statistics

• Knowledge of HPV, continued:
  • Troublesome items about transmission of HPV:
    • 36.4% incorrectly believed:
      • “Condoms do not protect you from getting HPV.”
    • 49.7% did not know:
      • “HPV can be passed from person to person by skin to skin contact with an HPV infected area.”
  • Troublesome items about a cure for HPV:
    • 23.1% incorrectly believed:
      • “HPV goes away permanently if a woman gets the right treatment.”
    • 46.2% incorrectly believed:
      • “HPV can sometimes be cured with antibiotics.”
## TPB Regression Results

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>$\beta$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have had sexual intercourse</td>
<td>-.03</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used condom with last new partner</td>
<td>-.07</td>
<td>n.s.</td>
</tr>
<tr>
<td><strong>Attitude toward vaccine</strong></td>
<td>.33</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Subjective norm</strong></td>
<td>.39</td>
<td>.001</td>
</tr>
<tr>
<td>Perceived behavioral control</td>
<td>.06</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

$F (5, 118) = 19.55, p < .001; R^2 = .45$
### HBM Regression Results

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>$\beta$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have had sexual intercourse</td>
<td>-.02</td>
<td>n.s.</td>
</tr>
<tr>
<td>Used condom with last new partner</td>
<td>-.20</td>
<td>.01</td>
</tr>
<tr>
<td>Knowledge</td>
<td>-.11</td>
<td>n.s.</td>
</tr>
<tr>
<td><strong>Perceived susceptibility</strong></td>
<td>.41</td>
<td>.001</td>
</tr>
<tr>
<td>Perceived severity</td>
<td>.08</td>
<td>n.s.</td>
</tr>
<tr>
<td><strong>Benefits</strong></td>
<td>.25</td>
<td>.001</td>
</tr>
<tr>
<td>Barriers</td>
<td>-.06</td>
<td>n.s.</td>
</tr>
<tr>
<td><strong>Self-efficacy</strong></td>
<td>.21</td>
<td>.01</td>
</tr>
<tr>
<td>Cues to action</td>
<td>-.01</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

$F (9, 114) = 10.77, \ p < .001; \ R^2 = .46$
# Integrated Model Regression Results

<table>
<thead>
<tr>
<th>Predictor variables</th>
<th>β</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used condom with last new partner</td>
<td>-.11</td>
<td>.10</td>
</tr>
<tr>
<td><strong>Attitude toward vaccination (TPB)</strong></td>
<td>.24</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Subjective norm (TPB)</strong></td>
<td>.25</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Perceived susceptibility (HBM)</strong></td>
<td>.21</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Benefits (HBM)</strong></td>
<td>.18</td>
<td>.05</td>
</tr>
<tr>
<td><strong>Self-efficacy (HBM)</strong></td>
<td>.15</td>
<td>.05</td>
</tr>
</tbody>
</table>

\[ F (6, 116) = 22.62, \ p < .001; \ R^2 = .54 \]
Discussion

• Predicting vaccination among college-age women:
  • *Inter-personal factor*:
    • Norms of reference group
  • *Intra-personal factors*:
    • Positive attitude toward the vaccine
    • Susceptibility to HPV
    • Benefits of vaccination
    • Feelings of self-efficacy to vaccinate

• Gaps in knowledge of HPV remain:
  • Effects, transmission, and treatment
Limitations & Implications

**Limitations:**
- Sample of convenience
- Intentions ≠ actual vaccination behavior
- Knowledge of HPV assessed, not of vaccine itself

**Implications:**
- Knowledge of vaccine may impact intention to vaccinate
- Positively-framed messages about the vaccine may be effective in increasing self-efficacy and perceptions of benefits, and in promoting positive attitudes
- Peer-based interventions may be beneficial
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