The Parent Attitudes about Childhood Vaccines (PACV) Survey Tool

Research and Applications

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Key Discussion Points

• PACV Research
  • Development and Initial Validation
  • Ongoing Evaluations of PACV

• PACV Applications
  • Descriptive measure
  • Surveillance tool
  • Outcome measure
  • Clinical screening tool
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Development and Validation of the PACV

Survey development → Test of Construct Validity → Test of Predictive Validity
# Health Belief Model

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived susceptibility</td>
<td>Beliefs about the chances of getting a condition</td>
</tr>
<tr>
<td>Perceived severity</td>
<td>Beliefs about the seriousnessness of a condition and its consequences</td>
</tr>
<tr>
<td>Perceived benefits</td>
<td>Beliefs about the effectiveness of taking action to reduce risk or seriousness</td>
</tr>
<tr>
<td>Perceived barriers</td>
<td>Beliefs about the material and psychological costs of taking action</td>
</tr>
<tr>
<td>Cues to action</td>
<td>Factors that activate ”readiness to change”</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>Confidence in one’s ability to take action</td>
</tr>
</tbody>
</table>
**4 Step Process for PACV Development**

**ITEM SELECTION**
12 items modified from existing relevant survey instruments, 5 items constructed *de novo*  
[17 total survey items]

**AUGMENTATION OF ITEM POOL**
10 additional items generated from 2 focus groups involving VHPs (N=4) and 2 focus groups of community pediatricians (N=7)  
[27 total survey items]

**ITEM REDUCTION**
9 items deleted based on the review of a panel of experts (N=6) who rated each item’s significance in being able to identify vaccine hesitant parents  
[18 total survey items]

**PRETESTING**
1 item added, 1 item deleted, and format changes made based upon cognitive interviews and feedback from parents (N=25)  
[18 total survey items in preliminary survey]
<table>
<thead>
<tr>
<th>No.</th>
<th>Parent Attitudes about Childhood Vaccines Survey Item</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Have you ever delayed having your child get a shot for reasons other than illness or allergy?</td>
<td>Yes/No/Don’t Know</td>
</tr>
<tr>
<td>2</td>
<td>Have you ever decided not to have your child get a shot for reasons other than illness or allergy?</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>How sure are you that following the recommended shot schedule is a good idea for your child?</td>
<td>0-10 scale</td>
</tr>
<tr>
<td>4</td>
<td>Children get more shots than are good for them.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I believe that many of the illnesses that shots prevent are severe.</td>
<td>Strongly agree – Strongly disagree</td>
</tr>
<tr>
<td>6</td>
<td>It is better for my child to develop immunity by getting sick than to get a shot.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>It is better for children to get fewer vaccines at the same time.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>How concerned are you that your child might have a serious side effect from a shot?</td>
<td>Not at all concerned – Very concerned</td>
</tr>
<tr>
<td>9</td>
<td>How concerned are you that any one of the childhood shots might not be safe?</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>How concerned are you that a shot might not prevent the disease?</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>If you had another infant today, would you want him/her to get all the recommended shots?</td>
<td>Yes/No/Don’t Know</td>
</tr>
<tr>
<td>12</td>
<td>Overall, how hesitant about childhood shots would you consider yourself to be?</td>
<td>Not at all hesitant – Very hesitant</td>
</tr>
<tr>
<td>13</td>
<td>I trust the information I receive about shots.</td>
<td>Strongly agree – Strongly disagree</td>
</tr>
<tr>
<td>14</td>
<td>I am able to openly discuss my concerns about shots with my child’s doctor.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>All things considered, how much do you trust your child’s doctor?</td>
<td>0-10 scale</td>
</tr>
</tbody>
</table>

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Test of the PACV’s **Construct Validity**

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Opel et al. *Vaccine* 2011
Test of the PACV’s Predictive Validity

10 Tier PACV Score

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Ongoing evaluations of the PACV

- Different geographic populations
- Different age populations
- Different clinical settings
Performance of PACV in parent population in Nashville, TN, USA

Table 3. Mean Proportion of Days Underimmunized and Number of Children Not Up-to-Date by 19 Months (580 Days) on All Vaccination Doses Recommended by 15 Months of Age by the Advisory Committee on Immunization Practices,11 According to PACV Score Group.

<table>
<thead>
<tr>
<th>PACV Score Group</th>
<th>n</th>
<th>Mean Proportion of Days Underimmunized, Percentage (95% CI)</th>
<th>Number Not Up-to-Date, n (Percentage of Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to &lt;10</td>
<td>73</td>
<td>1.5% (1.0%-2.0%)</td>
<td>3 (4.1%)</td>
</tr>
<tr>
<td>10 to &lt;20</td>
<td>26</td>
<td>2.6% (0.3%-5.0%)</td>
<td>2 (7.7%)</td>
</tr>
<tr>
<td>20 to &lt;30</td>
<td>22</td>
<td>2.8% (0.7%-4.9%)</td>
<td>4 (18.2%)</td>
</tr>
<tr>
<td>30 to &lt;40</td>
<td>16</td>
<td>2.7% (1.0%-4.5%)</td>
<td>3 (18.8%)</td>
</tr>
<tr>
<td>40 to &lt;50</td>
<td>7</td>
<td>16.9% (2.4%-31.3%)</td>
<td>3 (42.9%)</td>
</tr>
<tr>
<td>50 to &lt;60</td>
<td>7</td>
<td>3.1% (0.6%-5.6%)</td>
<td>3 (42.9%)</td>
</tr>
<tr>
<td>60 to &lt;70</td>
<td>3</td>
<td>8.4% (0.9%-17.7%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td>70 to &lt;80</td>
<td>3</td>
<td>34.0% (5.2%-73.1%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td>80 to &lt;90</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>90 to 100</td>
<td>1</td>
<td>100%</td>
<td>1 (100%)</td>
</tr>
</tbody>
</table>

*P ≤ .001, Pearson’s χ².
Performance of PACV in adolescent setting in Oklahoma and South Carolina, USA

- Modified the PACV for use in the adolescent setting
- Administered it to a convenience sample of parents of adolescents aged 11 to 17 (N=363) presenting for care at a diverse group of six pediatric practices in Oklahoma and South Carolina
- Associated parental PACV scores with vaccination status of the adolescents for 3 vaccines (Tdap, MCV4, and HPV)
- PACV score failed to predict adolescent vaccine uptake at an office visit
Performance of PACV in US ED setting for influenza vaccine

**Fig. 2.** Proportion of parents refusing influenza vaccine by dichotomized PACV total score.
Upshot

• PACV is a widely used and validated measure of vaccine hesitancy
• Need for international validation studies
  • PACV has been distributed to investigators, clinicians, and public health experts in 7 countries
    • Americas: Canada
    • Asia: Malaysia, Philippines, Singapore, India
    • Europe: England, Croatia
• Email me if you would like the survey and how to score it: djopel@uw.edu
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PACV as surveillance tool

- Currently no valid measure of vaccine hesitancy at the population level in the US
  - Non-medical exemption rates are typically used, though these data are often limited in completeness or quality
- Childhood National Immunization Coverage Survey, Public Health Agency of Canada
- Questionnaire Development Research Lab (QDRL), National Center for Health Statistics, CDC, USA
A Randomized Trial to Increase Acceptance of Childhood Vaccines by Vaccine-Hesitant Parents: A Pilot Study

S. Elizabeth Williams, MD; Russell L. Rothman, MD, MPP; Paul A. Offit, MD; William Schaffner, MD; Molly Sullivan; Kathryn M. Edwards, MD

From the Vanderbilt Vaccine Research Program (Dr. Williams, Ms. Sullivan, and Dr. Edwards), Departments of Medicine and Pediatrics (Dr. Rothman), Department of Preventive Medicine (Dr. Schaffner), Vanderbilt University School of Medicine, Nashville, Tenn.; and Vaccine Education Center, Children’s Hospital of Philadelphia, Philadelphia, Pa. (Dr. Offit)
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Received for publication February 6, 2013; accepted March 19, 2013.

**ABSTRACT**

**OBJECTIVE:** A cluster randomized trial was performed to evaluate an educational intervention to improve parental attitudes and vaccine uptake in vaccine-hesitant parents.

enrolled, 67 in the control group (mean PACV score 37) and 55 in the intervention group (mean PACV score 40). Two-month PACV surveys were completed by 108 (~90%) of en-
Randomized Trial in Washington State, USA

Control (Baseline) | Control (6 months) | Intervention (Baseline) | Intervention (6 months)

- Control (Baseline): 12.6%
- Control (6 months): 8.0%
- Intervention (Baseline): 9.8%
- Intervention (6 months): 7.5%

Adjusted OR: 1.22 (0.47, 2.68)

PACV ≥50
PACV <50

Henrikson N et al. Pediatrics 2015
PACV as a clinical screening tool: the PACV short scale

• I trust the information I receive about shots.
• It is better for my child to develop immunity by getting sick than to get a shot.
• It is better for children to get fewer shots at the same time.
• Children get more shots than are good for them.
• Overall, how hesitant about childhood shots would you consider yourself to be?
Validation of the PACV short scale

Comparative analysis of the Parent Attitudes about Childhood Vaccines (PACV) short scale and the five categories of vaccine acceptance identified by Gust et al.

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b Emory University, Department of Medicine, Division of Infectious Diseases, Emory University School of Medicine, Atlanta, GA, USA
c Emory Vaccine Center, Atlanta, GA, USA
Conclusion

• PACV is one of several tools to measure vaccine hesitancy
• Integration into clinical setting and as public health surveillance tool are newest applications
• Adaptation to and evaluation in your own setting is encouraged
Thank you!