

The Perfect Storm: A Case Study in Effective Immunization Education for Nurse Practitioners and Physician Assistants in Collaboration With the Centers for Disease Control and Prevention

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As part of its mission to provide tailored education to nurse practitioners (NPs) and physician assistants (PAs), Practicing Clinicians Exchange (PCE), along with continuing education (CE) provider Boston University School of Medicine (BUSM), sought to determine the best means of optimizing immunization rates via educating this growing group of primary care clinicians. This poster highlights key steps in developing effective, multisupported immunization education for NPs and PAs: an initial gap analysis of clinical care, the creation of a partnership with the Centers for Disease Control and Prevention (CDC) to enhance program effectiveness, and outcomes measures for the program which began in January 2009 and continues through December 2010.

Introduction

Immunizations are an essential pillar of preventive primary care that have reduced morbidity and mortality, added years to the average lifespan, and saved billions of dollars.¹ Unfortunately, they are only effective when coverage is high enough to provide herd immunity. NPs and PAs are increasingly becoming front-line primary care clinicians in the United States.² They will be key stakeholders in keeping immunization rates high to protect the public health. It is imperative that these clinicians be properly educated in immunization practices to fulfill this commitment.

Identifying the Knowledge Gap Among NPs and PAs

Objectives

To better define the role of NPs and PAs in vaccine administration, PCE and BUSM sought to identify gaps in clinician competence and knowledge around which to base an effective educational initiative that could ultimately increase immunization rates nationally. PCE also aimed to determine how NPs and PAs were utilizing current immunization educational resources developed by the CDC.

Methods

A 21-question survey was developed for NPs and PAs to assess: (1) knowledge of existing CDC educational immunization initiatives; (2) current immunization practices; (3) current source of immunization education; and (4) immunization competence. The survey was distributed via e-mail to 400 NPs and 400 PAs from the PCE proprietary database and completed on an Internet-based survey site.

Results

A total of 86 (10.75%) participants responded to the survey—64.7% of responses were from NPs and 35.3% were from PAs. Nearly 60% of the participants administered >10 vaccines per month (Figure 1), and nearly 90% administered vaccines to adults. The most administered vaccines were influenza (91.8%); combined tetanus, diphtheria, and pertussis (Tdap) (75.5%); hepatitis B (67.3%); and pneumococcal (61.2%) (Figure 2).

	Very competent (%)	Somewhat competent (%)	Not competent (%)
The electronic Vaccine Adverse Event Reporting System (VAERS)	9.5	28.4	62.2
Catch-up strategies for missed or deferred vaccinations	13.9	51.4	34.7
Administration of the herpes zoster vaccine	12.7	56.3	31.0
Interventions to increase vaccination coverage levels	19.7	49.3	31.0
Strategies for enhancing access to immunization	20.3	51.4	28.4
Timing and spacing of childhood vaccines	23.3	49.3	27.4
Preventing injury from postvaccination syncope	26.3	52.6	21.1
Incorporating vaccinations into adolescent health visits	25.0	50.0	25.0
Timing of vaccinations	27.3	59.7	13.0
Proper storage and handling of vaccines	30.7	45.3	24.0
Proper vaccine administration and pain management techniques	32.9	46.1	21.1
Achieving high influenza vaccination coverage rates in your practice	48.0	38.7	13.3

FIGURE 3. IMMUNIZATION SURVEY: COMPETENCE.

	Very knowledgeable (%)	Somewhat knowledgeable (%)	Not knowledgeable (%)
Recent ACIP vaccine updates	6.6	34.2	59.2
Factors impacting immunization coverage rates	5.3	46.7	48.0
The Vaccine Adverse Event Reporting System (VAERS)	8.0	34.7	57.3
When to use TIV vs LAIV	6.6	48.7	44.7
Comparative features of influenza vaccines	9.2	63.2	27.6
Schedule of administration of rotavirus vaccine	7.9	30.3	61.8
New childhood combination vaccinations	7.9	31.6	60.5
ACIP recommendations for administration of herpes zoster vaccine	13.2	50.0	36.8
Type of influenza vaccine to use in pregnancy	17.3	32.0	50.7
Type of influenza vaccine to use in children	17.3	52.0	30.7
Contraindications to the herpes zoster vaccine	16.0	52.0	32.0
Age groups eligible for live attenuated influenza vaccination	18.4	60.5	21.1
Providing appropriate information to patients and parents about vaccines	22.4	52.6	25.0
Age groups able to receive the herpes zoster vaccine	23.0	55.4	21.6
HPV vaccine intervals	35.1	40.5	24.3
Vaccination recommendations for healthcare workers	39.2	47.3	13.5

FIGURE 4. IMMUNIZATION SURVEY: KNOWLEDGE.

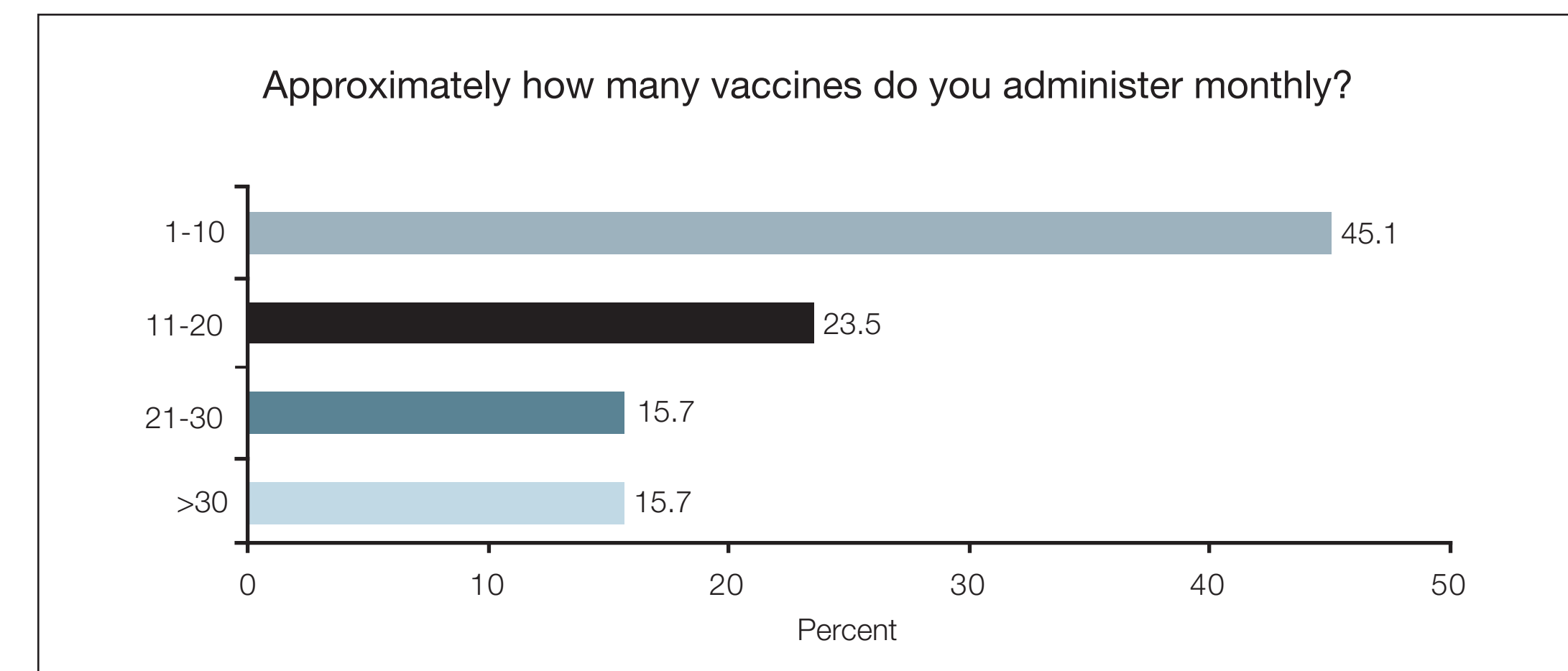


FIGURE 1. IMMUNIZATION SURVEY: VACCINE ADMINISTRATION.

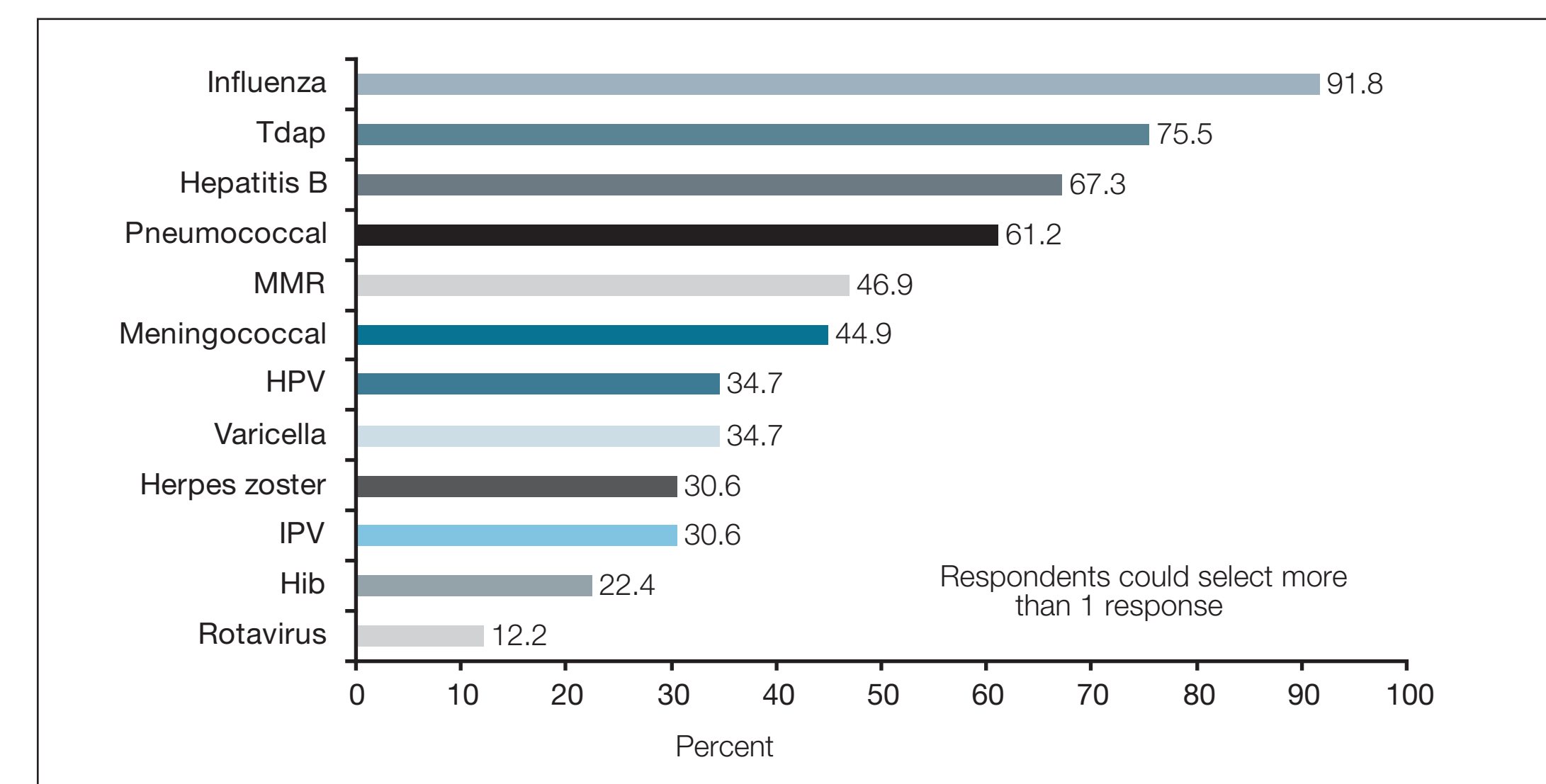


FIGURE 2. IMMUNIZATION SURVEY: VACCINES ROUTINELY OFFERED.

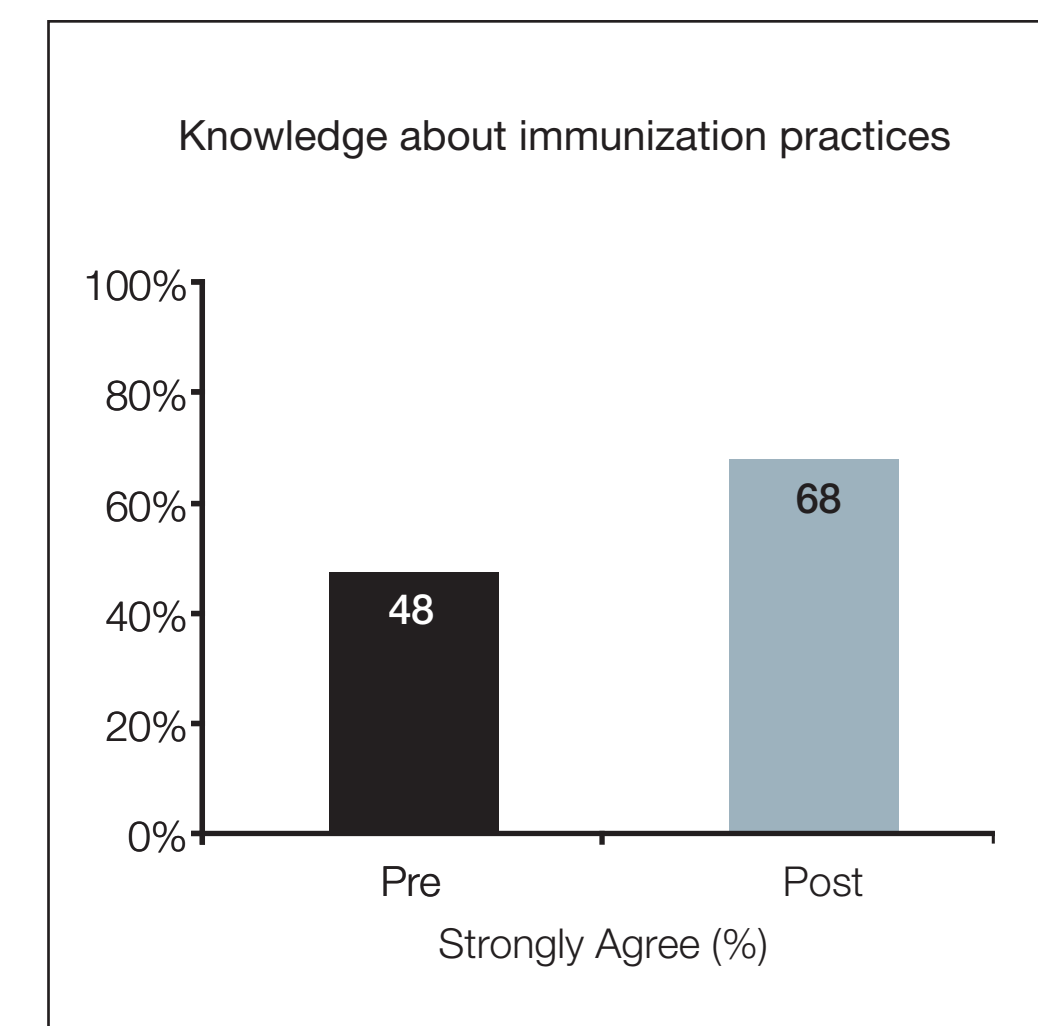


FIGURE 5. IMMUNIZATION KNOWLEDGE: OVERALL CHANGE.

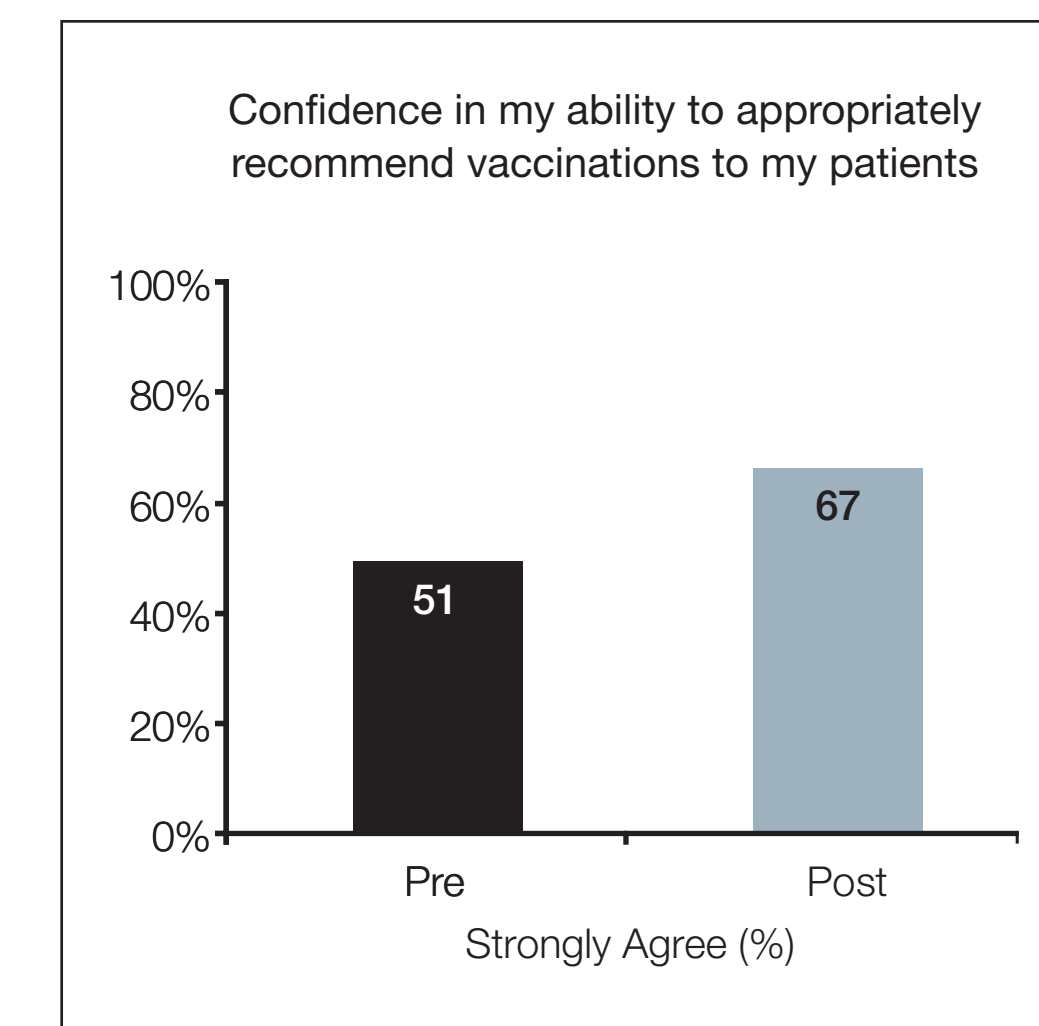


FIGURE 6. IMMUNIZATION CONFIDENCE: OVERALL CHANGE.

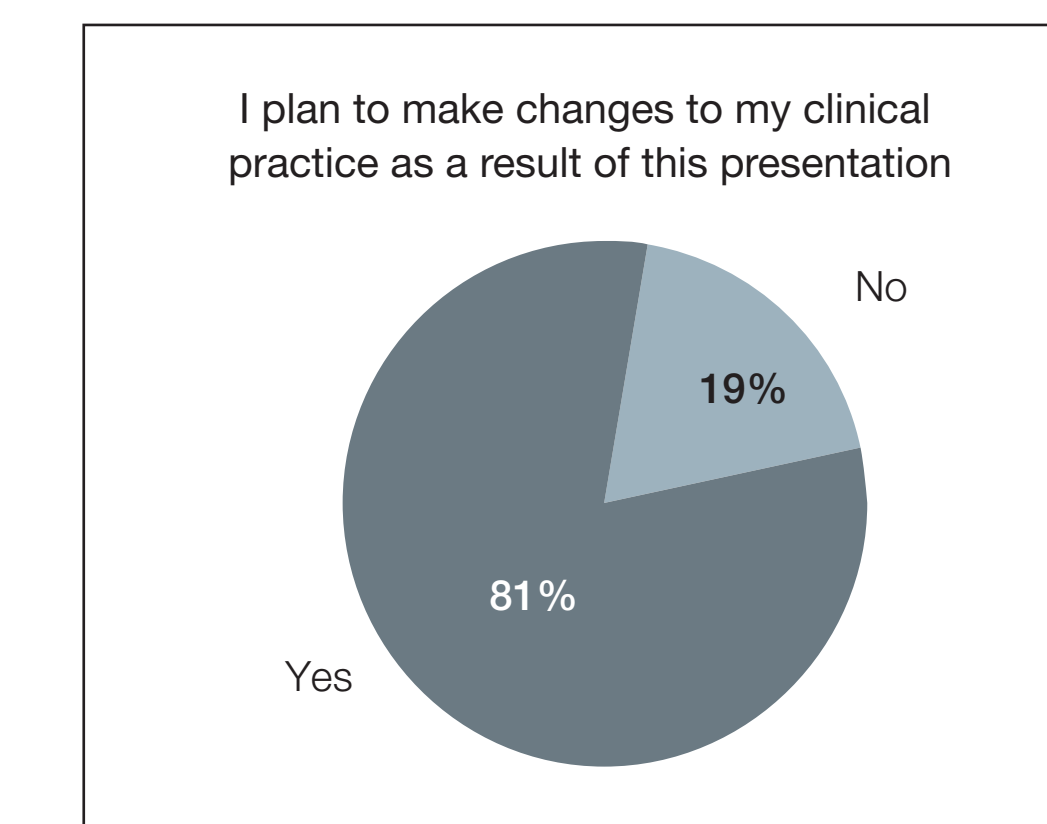


FIGURE 7. PLANNED PRACTICE CHANGE: POST-MEETING.

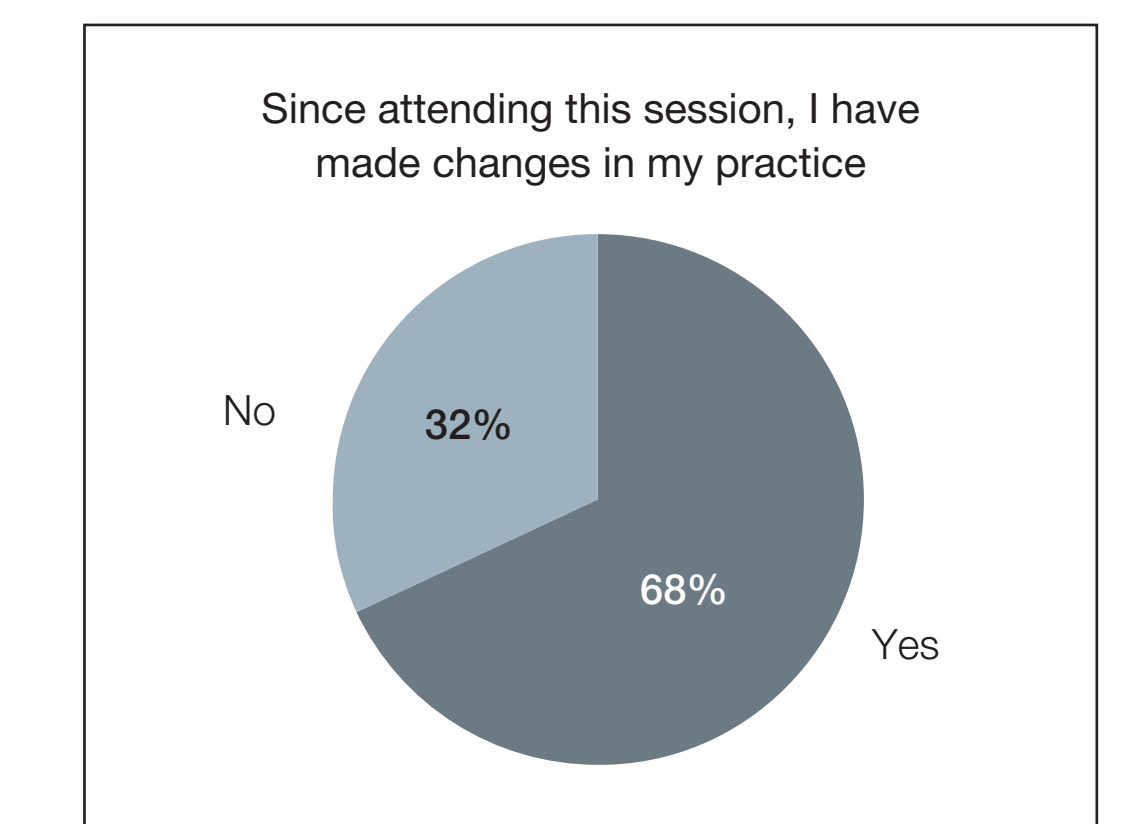


FIGURE 8. PRACTICE CHANGE AT 2-MONTH FOLLOW-UP.

Knowledge and confidence. Participants rated their knowledge of immunization practices prior to the presentation an average of 4.20 on a 1-5 scale. After the meeting, they rated their knowledge as 4.64. This difference was statistically significant ($P < .001$) and translated into a 20% positive change (Figure 5). Results for pre- and post-meeting self-reported confidence were similar, with an average rating of 4.28 before the meeting and 4.64 after the meeting, and a 16% positive change (Figure 6). This was also a statistically significant gain ($P < .001$). Finally, 81% of participants said they would make changes to their clinical practice as a result of the presentation (Figure 7).

Self-reported change in practice. A follow-up survey was sent to all participants 8-10 weeks after the presentation. A response rate of 15.3% was achieved; 83% of responses were from NPs and 17% were from PAs. More than 85% agreed or strongly agreed that their confidence in recommending and administering immunizations increased, and 68% of participants said they made a change to their clinical practice (Figure 8). Of note, 75.4% of participants believed they were better able to educate patients about the benefits of vaccinations as a result of the presentation (Figure 9).

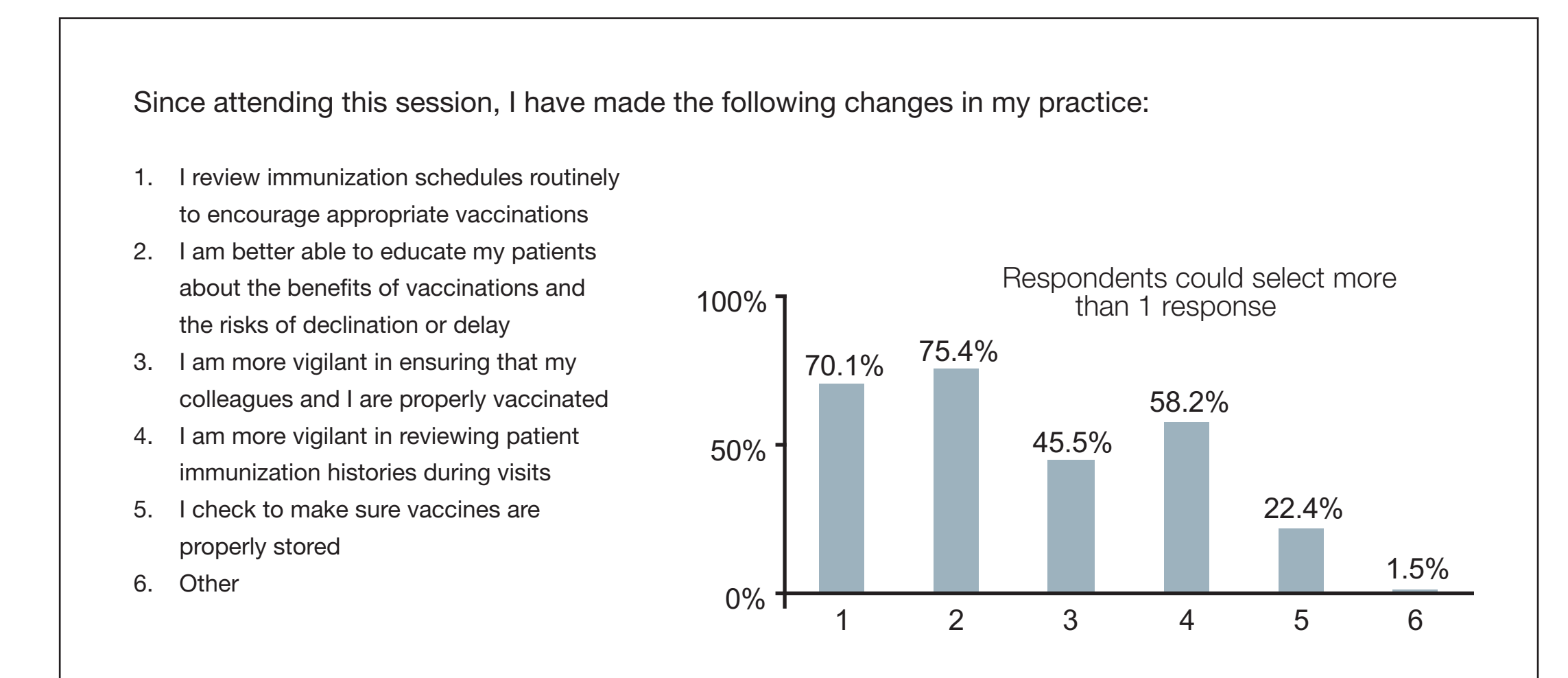


FIGURE 9. PRACTICE CHANGE AT 2-MONTH FOLLOW-UP: IMMUNIZATION PROTOCOLS, SAFETY, AND PATIENT EDUCATION.

Conclusions/Future Directions

Collaboration among the CDC and PCE, along with BUSM, is an effective means of delivering impactful immunization education to the growing ranks of primary care NPs and PAs. With this foundation in place, the CDC and PCE have extended their partnership for continued educational initiatives. To assess the impact of this education on achieving optimal immunization rates in the United States, the CDC, PCE, and BUSM are developing a performance improvement (PI) program that will begin with a regional pilot program and expand to a national scale over the next several years.

References

- Satcher D. Statement on risk vs benefit of vaccinations. Before the House Committee on Government Reform. <http://www.hhs.gov/asl/testify/t990803a.html>. Accessed October 5, 2009.
- Hooker RS, McCaig LF. Use of physician assistants and nurse practitioners in primary care, 1995-1999. *Health Affairs*. 2001;20:231-238.



Competence and knowledge. Participants reported being least competent in the areas of reporting adverse events, immunization catch-up strategies, and methods for increasing vaccine access and coverage levels. Less than 25% of all participants reported being very competent in these areas (Figure 3). Participants were least knowledgeable about Advisory Committee on Immunization Practices (ACIP) updates, factors influencing coverage rates, reporting adverse events, and the differences between the live and inactivated influenza vaccines; <10% were very knowledgeable in these areas (Figure 4).

Participants were also not aware of immunization education through the CDC. While 77.5% knew of the CDC Web site, and 67.6% had accessed it at least once, only 25% were aware of CDC Immunization Webcasts. Two thirds of respondents were interested in an educational collaboration between the CDC and PCE and desired education on immunization specifically targeted to NPs and PAs.

Conclusions

There is a need for NP/PA-targeted education as an effective way to fill current gaps in immunization practices. NPs and PAs lack knowledge and competence regarding increasing immunization coverage levels, reporting of adverse events, and recent recommendations. They are also not being effectively reached by current CDC immunization educational activities. To bridge these gaps, a collaboration for educational development was established among the CDC, PCE, a leader in educating NPs and PAs, and BUSM as CE provider, through the PCE national symposia series.

An Educational Partnership With the CDC

On February 6, 2009, PCE formed a partnership with the CDC to provide immunization CE programs for NPs and PAs throughout the United States. The CDC developed a 2-hour CDC 2009 Immunization Update that was presented at 18 symposia from coast to coast, reaching over 4500 NPs and PAs. In addition to the live presentations, handouts with summaries of vaccine recommendations and standing orders were distributed to all attendees. Three enduring materials were also developed under this collaboration and sent to 50,000 NPs and PAs nationwide. All content was jointly developed with BUSM, the CE provider. Additional accreditation was provided by the American Academy of Physician Assistants and the American Academy of Nurse Practitioners. The program was supported by grants from GlaxoSmithKline, Merck, and Sanofi-Pasteur.

Program Evaluation and Outcomes

Methods

PCE and BUSM follow a continuous improvement model in the development of educational activities. As part of that model, Moore's Level 1-4 outcomes data are measured to determine the extent of audience learning and how effectively the program curriculum meets the educational objectives. Learners participating in a single activity are measured through Moore's Level 3 (knowledge and competence) and Moore's Level 4 (confidence and self-reported practice change) outcomes measures. Evaluation methods used to gauge the effectiveness of an activity include:

- Pre- and post-activity competency measures
- Expressed intent to change behavior or incorporate newly acquired strategies

An outcomes survey is sent to attendees to determine whether the program learnings were retained by the participants and incorporated into patient care 8-10 weeks after each live series.

Results

To date, more than 2300 NPs and PAs have been educated as part of the ongoing live symposia series. Evaluations were completed by >90% of attendees.