BRIEF REPORTS

Shots by STFM: Value of Immunization Software to Family Medicine Residency Directors: A CERA Study

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BACKGROUND AND OBJECTIVES: The Group on Immunization Education (GIE) of the Society of Teachers of Family Medicine (STFM) has developed Shots by STFM immunization software, which is available free of charge for a variety of platforms. It is routinely updated with the Center for Disease Control and Prevention’s (CDC’s) most recent immunization schedules. Successful development and marketing of teaching resources requires periodic evaluation of their use and value to their target audience. This study was undertaken to evaluate the 2011 version of Shots by STFM.

METHODS: Family medicine residency directors were surveyed about their use of Shots by STFM for teaching residents and their ratings of its features.

RESULTS: The response rate for the survey was 38% (172/452). While awareness of Shots by STFM among responding residency directors was low (57%), ratings by those using the resource were excellent. Thirty percent of respondents recommend or require their residents to use Shots by STFM.

CONCLUSIONS: Better marketing of Shots by STFM to family medicine residency directors seems to be indicated.

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Vaccines are one of the great public health advances and save thousands of lives. Despite this success, disease burden remains substantial; for instance, pneumococcus causes about 500,000 cases of pneumonia, 50,000 cases of bacteremia, 3,000 cases of meningitis, and up to 7,000–12,500 deaths each year.\(^1\) One reason for the remaining burden of vaccine-preventable diseases is inadequate immunization rates. Among persons ages 65 years and older, the seasonal influenza vaccination rate among those who received an influenza vaccination during the past 12 months was 65.5%,\(^2\) while the rate for those who had ever received a pneumococcal polysaccharide vaccine (PPSV) was 59.4% in 2010.\(^3\) Among the reasons for sub-optimal immunization rates are the increasing complexity of the immunization schedule and concerns about vaccine safety. Electronic, point-of-care resources are a means to address the schedule complexity and vaccine safety concerns by providing accessible information on valid contraindications, vaccine adverse events, and vaccine safety messages.

Hence, the STFM Group on Immunization Education produced Shots by STFM, which is available online and as a downloadable application ("app") for iPhones, Android smartphones, and tablets. The purpose of this study was to assess the use of www.ImmunizationEd.org and Shots by STFM as a teaching tool in family medicine residencies by surveying residency directors.

METHODS
This project is part of a larger CERA (Council of Academic Family Medicine [CAFM] Educational Research Alliance) omnibus survey. The methods of that survey and demographics of the sample have previously been presented.\(^4\) Briefly, CERA administers an annual survey of family medicine residency directors with the goal of improving the quality of the design and results of survey research in family medicine. Data for this study came from the inaugural CERA survey.

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Most questions about immunizations had categorical or Likert-type response options. Thus, counts, proportions, and chi-square tests were calculated using SPSS (SPSS 20.0.0 for Windows, 2011, Chicago). Some variables were presented from a prior survey of STFM program directors\(^5\) to allow for comparisons over time. This project was approved by the Institutional Review Boards of the University of Pittsburgh and the American Academy of Family Physicians (AAFP).

**Results**

The response rate for the survey was 38% \((172/452)\). Use of the STFM’s Group on Immunization Education web site (www.ImmunizationEd.org) was modestly higher in 2011 (45%) than 2005 (37%) (Figure 1), and one third of respondents had downloaded the Shots by STFM app to their mobile device (3% Android platform, 18% iPhone/iPad, and 12% other). For teaching, reported use among respondents was 16% monthly, 6% weekly, 1% daily, and 77% never or almost never. For respondents’ own clinical practice, use was 15% monthly, 9% weekly, 1% daily, and 75% never or almost never. When nonusers were asked why they were not using Shots by STFM, respondents cited, “Never heard of it” (50%), “Prefer another resource” (32%), and “Other” (18%). The percentage of respondents aware that Shots by STFM was on social media (ie, Twitter, Facebook, YouTube) was small, ranging from <1% to <2%.

Nevertheless, compared with other types, electronic immunization resources (web sites, immunization schedules) were cited as the most important (86% important/extremely important, Table 1). When asked which software packages for smartphones or mobile devices were recommended or required for residents, Shots by STFM was recommended by 29% and required by 1%, while 17% recommended and 0% required another immunization software. Other software such as pharmacy databases, disease risk calculators, or clinical software were recommended by 55% and required by 7% of respondents.

The ratings by users of the various sections of Shots by STFM were high on a four-item scale of excellent, good, fair, and poor. The following ratings of good or excellent by section of Shots by STFM were reported: basics (98%), high-risk indications (100%), adverse reactions (96%), contraindications (98%), catch-up (94%), administration (96%), value of risk/safety communication section (92%), epidemiology (89%), additives (86%), and pictures (87%). When asked about preferences that might improve the program’s usefulness, respondents identified: travel vaccines (37%), combination vaccines (26%), military vaccines (2%), and no preference (35%).

**Discussion**

Shots by STFM was highly rated when used, but 43% of program directors responding to the survey were unaware of it, and only 33% of respondents had downloaded the app. We also found that only 43% of survey respondents had accessed the STFM GIE web site www.ImmunizationEd.org. This modest level of awareness is disappointing, given displays at annual meetings of STFM and AAFP, links from AAFP’s and the Center for Disease Control and Prevention’s (CDC) web sites, being listed among the top pediatric apps,\(^6\) and the finding that electronic immunization resources were rated as the most important by responding residency program directors.

In 2011, Shots by STFM was available for download on three mobile device platforms and viewable on the internet in both full screen and mobile formats. The 39,898 downloads were installed on mobile devices running iOS (61.8%), Android (17.5%), and WebOS (3.9%) (personal communication, Jonathan Raviotta, 2011).

Why the moderate awareness among responding residency directors and how to respond? Several possibilities must be considered: (1) A competing app was in the Apple App store ahead of Shots by STFM and is well marketed. (2) Key word optimization for Shots by STFM may be necessary, to reduce confusion about the content (vaccines, not alcohol or pictures) and to compete with programs that use labels that physicians recognize, such as “immunization.” (3) At the time of the survey, Shots by STFM was only available for BlackBerry devices as a mobile internet file and was not available through BlackBerry App World.\(^4\) Marketing budgets for Shots by STFM have been small, necessitating the use of online advertising, but that approach does not seem to

![Figure 1: Usage of STFM’s Group on Immunization Education Web Site (www. ImmunizationEd.org) by STFM Program Directors, Comparing 2011 With 2005](image)
be reaching this target audience. (5) The CERA survey was not directed to trainees and young physicians who are often more tech savvy and more likely to encourage their colleagues to use Shots by STFM. It is possible that this younger group may have reported greater awareness of the application. (6) The increasing use of electronic medical records (EMRs) reduces the need for the sections of Shots by STFM that contain immunization schedules; however, many other sections remain useful (eg, risk communication, additives, epidemiology, pictures, administration, contraindications), even when an EMR is used.

As a result of ongoing evaluation, the STFM Group on Immunization Education (GIE) has implemented or planned the following enhancements to Shots by STFM: (1) addition of combination vaccine schedules for children, (2) crisper screen resolution for some devices, (3) improved touch screen functionality because the denser immunization schedule has created an increasingly crowded screen. Additionally, the GIE has published a review of ways to stay up to date.7 Clearly, these improvements need to be communicated better to residency directors.

Limitations of this study include a low response rate and the limited number of questions available on the survey to address immunization education. We plan complementary evaluation components, including a CDC review of each update of Shots by STFM immunization science and review of user comments in Google Play for Android phones and the iTunes App Store for iPhones. Further research might address the relationship between use of Shots by STFM and vaccination rates in residency practices.

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Table 1: Importance of Printed, Electronic, and Bound Immunization Materials for Educating Residents

<table>
<thead>
<tr>
<th>Resource</th>
<th>Not Important</th>
<th>Slightly Important</th>
<th>Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preprinted handouts of immunization schedule*</td>
<td>6%</td>
<td>19%</td>
<td>51%</td>
<td>24%</td>
</tr>
<tr>
<td>Electronic resources (web or Smartphone)**</td>
<td>2%</td>
<td>12%</td>
<td>45%</td>
<td>41%</td>
</tr>
<tr>
<td>Printed, bound materials such as AAP Red Book and CDC's Pink Book</td>
<td>20%</td>
<td>38%</td>
<td>37%</td>
<td>5%</td>
</tr>
</tbody>
</table>

* P < .001 for preprinted handouts versus printed, bound materials by likelihood ratio
** P = .07 for electronic resources versus printed, bound materials by likelihood ratio

AAP—American Academy of Pediatrics
CDC—Center for Disease Control and Prevention

References