



Major article

Barriers and facilitators to influenza vaccination and vaccine coverage in a cohort of health care personnel

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Background: Annual influenza vaccination is recommended for health care personnel (HCP). We describe influenza vaccination coverage among HCP during the 2010-2011 season and present reported facilitators of and barriers to vaccination.

Methods: We enrolled HCP 18 to 65 years of age, working full time, with direct patient contact. Participants completed an Internet-based survey at enrollment and the end of influenza season. In addition to self-reported data, we collected information about the 2010-2011 influenza vaccine from electronic employee health and medical records.

Results: Vaccination coverage was 77% (1,307/1,701). Factors associated with higher vaccination coverage include older age, being married or partnered, working as a physician or dentist, prior history of influenza vaccination, more years in patient care, and higher job satisfaction. Personal protection was reported as the most important reason for vaccination followed closely by convenience, protection of patients, and protection of family and friends. Concerns about perceived vaccine safety and effectiveness and low perceived susceptibility to influenza were the most commonly reported barriers to vaccination. About half of the unvaccinated HCP said they would have been vaccinated if required by their employer.

Conclusion: Influenza vaccination in this cohort was relatively high but still fell short of the recommended target of 90% coverage for HCP. Addressing concerns about vaccine safety and effectiveness are possible areas for future education or intervention to improve coverage among HCP.

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Influenza vaccination can protect both health care personnel (HCP) and their patients from influenza-related morbidity and mortality.¹ Since the early 1980s, the Advisory Committee on Immunization Practices has recommended annual influenza vaccination for HCP.² Despite this long-standing recommendation,

influenza vaccination coverage rates among HCP in the United States have traditionally been low, between 30% and 50%.^{1,3-5} Frequently reported barriers to vaccination among HCP include concerns about adverse reactions, low perceived vaccine efficacy, low perceived susceptibility to influenza infection, and inconvenience.^{1,6} Recent literature suggests that vaccine coverage rates among HCP can be increased beyond the Healthy People 2020 goal of 90% by requiring vaccination as a condition of employment, and many institutions have recently moved forward with mandatory employee influenza vaccination programs.⁷⁻¹² However, employer-required vaccination can be viewed as coercive by HCP,^{13,14} and these types of policies have been the subject of much debate among health care administrators and professional organizations.¹⁵⁻¹⁷

This paper describes influenza vaccination coverage in a cohort of HCP using data from 2 health care delivery systems during the

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2010-2011 influenza season and a combination of electronic health record and self-reported vaccination data. We also describe reported adverse events following vaccination and present reported facilitators of and barriers to vaccination. In both delivery systems, employee vaccination was encouraged but not required during the study period. We also describe reported attitudes toward required vaccination and use of vaccination declination forms among unvaccinated participants.

METHODS

A detailed explanation of our methods for cohort recruitment is presented in a previous publication.¹⁸ Briefly, we enrolled a prospective cohort of HCP from September through December 2010 at Scott and White Healthcare (SWH) in Temple, Texas, and at Kaiser Permanente Northwest (KPNW) in Portland, Oregon. Eligible enrollees were 18 through 65 years of age; working full time (>32 hours per week); employed by and receiving medical care from SWH or KPNW for at least 12 months; and providing direct patient care, defined as "regular, close, face-to-face, or hands-on contact with patients as part of a typical work shift, including regular contact within 3 feet of patients for 5 minutes or more."¹⁹ We selected this definition of direct patient care to focus on HCP at greatest risk of influenza exposure and transmission to patients. We sent announcements and e-mail invitations regarding a study of "respiratory illness and health care workers" to all employees. Participants were offered small incentives in the form of cash (\$50 at SWH) or gift cards (\$25 at KPNW). Study procedures were approved by institutional review boards at both sites and the Centers for Disease Control and Prevention.

Data collection

Consented participants completed an Internet-based questionnaire at home or on facility computers at enrollment (fall 2010) and postinfluenza season (May/June 2011). At enrollment, participants reported their race/ethnicity, marital status, education, occupation, years of employment in patient care, and work setting (outpatient, intensive care unit, hospital, emergency department, long-term care). We collected information about participant's history of chronic illness, household composition, and job satisfaction in the postseason survey. Participants were classified as high-risk if they reported a history of diagnosed asthma, cancer, chronic lung disease, diabetes, heart problem, immunosuppression, kidney disease, or neurologic or neuromuscular disease. We identified high-risk households as those including pregnant women, infants less than 1 year of age, adults older than 65 years of age, or persons with asthma or other chronic health conditions. Participants were asked to report their job satisfaction on a 7-point scale ranging from extremely dissatisfied (1) to extremely satisfied (7).²⁰

We collected self-reported vaccination status during the enrollment survey (for the 2009-2010 pandemic H1N1 and seasonal vaccines) and at the postseason survey (for the 2010-2011 seasonal vaccine). We also collected information about receipt of the 2010-2011 influenza vaccine and up to 5 years of influenza vaccination history from electronic medical records and employee health records at the 2 sites.

Participants who reported during the postseason survey that they had received an influenza vaccine were asked a series of questions about possible vaccine adverse events (eg, fever, hives, allergic reactions, injection site pain). They were also asked to rate the relevance of 12 factors in their decision to be vaccinated. These items were presented in random order and rated on a Likert-type scale from strongly disagree (1) to strongly agree (5). Results are presented using the following categories: vaccine benefits (protect

self, protect family and friends, protect patients, avoid missing work), convenience and access (easy to get vaccine, vaccine offered free of charge, employer pays for vaccination time), and peer/employer recommendations (employer recommendation, most work colleagues get vaccinated, doctor or nurse recommendation, work colleague recommendation, employer requirement).

Participants who reported not having received an influenza vaccine at the postseason survey were asked to rate the relevance of 12 potential barriers to vaccination, again using a 5-point scale (strongly disagree [1] to strongly agree [5]). We grouped these potential barriers into 3 broad categories: vaccine safety concerns (concerned about adverse effects, concerned about getting the flu from the flu shot, did not want H1N1 component of the vaccine, had a severe reaction to a prior vaccination, allergic to the vaccine), low perceived susceptibility or vaccine effectiveness (flu is not a very serious illness, flu vaccination is not needed, flu vaccines do not work, do not have contact with people who get the flu, already had the flu earlier in the season), and access to vaccine (did not know how to get a flu shot, meant to get the vaccine but did not). We asked unvaccinated participants whether they made a conscious decision to be unvaccinated or were ambivalent or "on the fence" about vaccination. We also asked 2 questions about vaccine requirements ("Would you have received an influenza vaccination during this flu season if it was mandatory for all health care workers, unless there was a medical reason for them not to be vaccinated?") and the use of employee declination forms ("Would you have received an influenza vaccination during this flu season if you were required to either receive the flu vaccine or decline in writing by signing a declination form?"). Neither of these questions specified the consequence of vaccine refusal.

Analysis

We limited our analyses to participants who completed both the enrollment and postseason surveys. We calculated 2010-2011 influenza vaccination coverage rates by dividing the number vaccinated (based on either self-report or health record) by the total number of eligible participants. We described differences in vaccination coverage by study site, demographics (age, gender, race/ethnicity, marital status), education, occupation, years in patient care, work setting, job satisfaction, high-risk conditions, household composition, and influenza-vaccination history using χ^2 and *t* tests. We compared the concordance between self-reported and health record vaccination status for the 2010-2011 season using κ statistics. We described rates of reported adverse events and reasons for vaccine acceptance among participants who reported being vaccinated and reported barriers to vaccination among unvaccinated participants. We also described reported barriers to decline vaccination and participants who were ambivalent about vaccination. All descriptive analyses were conducted using SAS version 9.2 (SAS Institute, Cary, NC).

RESULTS

During the 2010-2011 season, the estimated influenza vaccination rate among all employees was 71% at SWH and 64% at KPNW based on employee health records. Approximately 40% of SWH and 20% of KPNW eligible HCP volunteered for the study. Of 1,834 HCP enrolled at both sites, 1,782 (97%) completed the enrollment survey. During the follow-up period, 81 participants refused subsequent participation, became ineligible because of changes in employment or insurance status, or were lost to follow-up. Ninety-three percent (*n* = 1,701) of the initial consented cohort completed both the enrollment and postseason surveys and were included in analyses.

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