Immunization education for internal medicine residents: A cluster-randomized controlled trial

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Abstract

Purpose: The aims of this study are to evaluate the impact of a novel immunization curriculum based on the Preferred Cognitive Styles and Decision Making Model (PCSDM) on internal medicine (IM) resident continuity clinic patient panel immunization rates, as well as resident immunization knowledge, attitudes, and practices (KAP).

Methods: A cluster-randomized controlled trial was performed among 143 IM residents at Mayo Clinic to evaluate the PCSDM curriculum plus fact-based immunization curriculum (intervention) compared to fact-based immunization curriculum alone (control) on the outcomes of resident continuity clinic patient panel immunization rates for influenza, pneumococcal, tetanus, pertussis, and zoster vaccines. Pre-study and post-study immunization KAP surveys were administered to IM residents.

Results: Ninety-nine residents participated in the study. Eighty-two residents completed pre-study and post-study surveys. Influenza and pertussis immunization rates improved for both intervention and control groups. There was no significant difference in immunization rate improvement between the groups. Influenza immunization rates improved significantly by 33.4% and 32.3% in the intervention and control groups, respectively. The odds of receiving influenza immunization at the end of the study relative to pre-study for the entire study cohort was 4.6 (p < 0.0001). The odds of having received pertussis immunization at the end of the study relative to pre-study for the entire study cohort was 1.2 (p = 0.0002). Both groups had significant improvements in immunization knowledge. The intervention group had significant improvements in multiple domains that assessed confidence in counseling patients on immunizations.

Conclusions: Fact-based immunization education was useful in improving IM resident immunization rates for influenza and pertussis. The PCSDM immunization curriculum did not lead to increases in immunization rates compared with the fact-based curriculum, but it did significantly increase resident confidence in communicating with patients about vaccines.

1. Introduction

Vaccines, praised as the greatest public health achievement of the 21st century, have declined in public confidence [1,2]. US immunization rates are well below the Healthy People 2020 targets [3,4]. In 2014, influenza vaccination coverage for adults aged ≥ 19 years was estimated at 43% [4]. Pneumococcal vaccination coverage among those aged ≥ 65 years was 61% [4]. Herpes zoster vaccine coverage among adults aged ≥ 60 years was 27.9%. Tetanus...
immunization education techniques taught in the intervention arm versus a control of fact-based immunization curriculum alone. The intervention group received the same fact-based immunization curriculum, their patient panel immunization rates, plus an additional PCSDM immunization education session. This session was administered over two hours and consisted of two additional PowerPoint presentations. The first presentation covered the cognitive styles and how these relate to vaccine decision making, as well as key communication strategies for each style within the framework of immunization education. The second session consisted of 10 case studies of patients presenting with vaccine hesitancy. The type of cognitive style was identified for each scenario, and strategies for communication and immunization education for each style were discussed.

2.4. Data collection

Pre-study immunization rates were measured during August of 2014. Pre-study KAP surveys were performed just prior to the intervention sessions that occurred in October–November 2014. Post-study KAP surveys and immunization rates were measured during June 2015, 7–8 months after the intervention.

Immunization rates (percentage immunized out of those eligible for immunization, as defined below per vaccine type) were determined using electronic data capture from the electronic medical record (EMR). Immunizations are captured in the EMR if they are given within the Mayo Health System. They are entered historically if they are given at another site. If an immunization was declined or deferred, it was counted as not up to date. Influenza immunization status was determined for adults ≥ 18 years and was considered up to date if the patient had received any influenza immunization during the prior influenza season. Pneumococcal immunization status was determined for adults aged ≥ 65 years, and receipt of any pneumococcal vaccine after age 65 was considered as being up to date. Tetanus (receipt of tetanus-containing vaccine within the last ten years) and pertussis (receipt of a pertussis-containing vaccine in adolescence or adulthood) rates were determined for adults aged ≥ 20 years. Zoster immunization status was determined for adults aged ≥ 60 years. Persons with contraindications to zoster immunization were not excluded from this analysis. The identical criteria were used for pre- and post-study immunization rates.

The KAP survey was conducted utilizing a unique identifier (only disclosed to the statistician) to link to each survey participant to demographic data. The KAP survey consisted of: 10-item IM board-style multiple choice questions (MCQ) of ACIP recommendations.
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