

Title: PROvision of a Vacclne EDucation IntErvention for Community Pharmacists: Recommendations for People Living with HIV

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Previous Presentations:

American Pharmacists Association Annual Meeting, Virtual, March 12-15, 2021, and presentation at the Illinois Pharmacy Resident Conference, Virtual, May 7, 2021.

Financial Support:

This work was supported in part by an American Pharmacists Association Foundation Incentive Grant for Pharmacy Resident Research. The funder had no role in the design, data collection, interpretation, or report writing.

Conflicts of Interest:

The authors declare no relevant conflicts of interests or financial relationships.

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Word Count:

Abstract: 262 words

Total: 1912 words

ABSTRACT:

Objectives: To assess the confidence level of pharmacists recommending vaccinations in persons living with HIV (PLWH) based on current Advisory Committee on Immunizations Practices (ACIP) guidelines in community settings before and after an educational intervention via a pre- and post- intervention survey.

Design: Prospective, pre- and post-intervention survey within the state of Illinois conducted in April-May 2021. The level of confidence in assessing immunization eligibility in PLWH were compared via educational training and potential variables, such as demographics were analyzed.

Setting and participants: Pharmacists employed at urban, suburban, metropolitan community pharmacy within the state of Illinois and grocery chain (Jewel-Osco, Albertsons Companies) in the Chicago area.

Outcome measures: This study will aim to measure the impact of an educational intervention on providing vaccinations to people living with HIV.

Results: A total of 29 respondents participated in pre- and post-intervention survey. the majority, 79% (23/29), were practicing in a chain drug store/grocery store/community independent pharmacy, 66% (n=19) were women, 34% (n=10) were men, 41% (n=12) were staff pharmacists, 93% (n=27) did not obtain board certification, and the mean years of practicing pharmacy was 21. A statistically significant increase in level of confidence in recommending the human papillomavirus virus (HPV) (P=0.003), hepatitis A (P=0.0163), hepatitis B (P=0.0120), measles, mumps, rubella (MMR) (P=0.0140), varicella (P=0.0141), and meningococcal conjugate (P=0.0032) vaccinations. There was no statistically differences seen in the PCV13, PPSV23, influenza, zoster, and tetanus, diphtheria, whooping cough vaccinations.

Conclusion: The results of this study identified the level of confidence and potential role pharmacists can embrace in providing care for PLWH beyond medication distribution and counseling.

BACKGROUND:

The pharmacists' role in providing care to PLWH HIV has expanded and evolved over the past several years in efforts to assist healthcare providers and patients to achieve successful outcomes and live a long, healthy, and safe life. Immunizing persons living with HIV (PLWH) is an important aspect of providing the necessary care and improving health outcomes in preventing pneumococcal disease, influenza, and complications of hepatitis viruses. PLWH are at an increased risk for a variety of infectious diseases due to an immunocompromised state. One of the challenges currently facing this patient population is achieving vaccine coverage to protect against serious complications such as pneumococcal disease or influenza.¹

Awareness of patient specific variables, combined with knowledge of clinical vaccination protocols may be important in identifying patients at risk for under-vaccination and provide for targeted education programs for both providers and patients. Pharmacists may not be confident with recommending vaccinations in patients who are immunocompromised. In addition, guidelines for PLWH are frequently updated and pharmacists may be unaware of the best resources in which to find the most up-to-date data regarding vaccination recommendations in this patient population. Most importantly, pharmacists should work collaboratively with healthcare providers to ensure these vaccines are received appropriately and in a timely manner.

However, vaccination rates remain low among persons living with HIV in the United States. A large cohort study found that only one-third of patients diagnosed with HIV had received one dose of the hepatitis B virus vaccination, with an even lower percentage receiving the hepatitis A virus vaccine.² Another United States-based study in PLWH found that only 42% were vaccinated for influenza.³ These low vaccination rates are attributed to a variety of factors, including a lack of knowledge regarding current guideline recommendations as well as the lack of infrastructure. HIV specialty care clinics may have logistical barriers to providing patients with the necessary vaccines or be prevented by insurers from billing for vaccines. Recent Infectious Diseases Society of America guidelines suggest the importance of specialists and primary care providers collaborating to ensure persons living with HIV receive timely administration of all recommended vaccinations.⁴

Despite recommended guidelines, there is still an apparent gap in the literature and data that show barriers to providing vaccinations in PLWH. PLWH do not have significantly more or different barriers to immunizations compared with persons without HIV which shows that both groups have the same barriers to receiving immunizations.⁵ Current educational programs and materials could be used to help pharmacists promote

immunization acceptance in the PLWH population. A notable concern this study found addressing these misconceptions were the safety, efficacy, and value of vaccinations.⁵ This study will aim to provide education surrounding vaccination recommendations for persons living with HIV to a broad range of pharmacists in various community-pharmacy practice settings and assess their level of confidence in providing vaccine recommendations for patients.

OBJECTIVE:

The primary objective of this study was to measure the level of confidence in pharmacists recommending vaccinations in PLWH based on current Advisory Committee on Immunizations Practices (ACIP) guidelines in community settings before and after an educational intervention via a pre- and post- intervention survey.

METHODS:

This study was a pre- and postintervention study distributed as an electronic survey via email to members of the Illinois Pharmacists Association and two Jewel-Osco, Albertsons Companies, districts in the Chicagoland area from April 2021 to May 2021. This study was approved by Midwestern University Institutional Review Board.

Inclusion criteria for the study included pharmacists practicing within a chain, supermarket-based, independent pharmacies; hospital outpatient (health-system); or long-term care setting. Once consent was obtained, pharmacists were provided a pre-survey to fill out to assess the level of confidence and clinical knowledge of providing immunizations to PLWH. Baseline data was assessed through the pre-survey which included: pharmacists' demographic data (age, gender identity, current pharmacy role, board certification), type of community-practice site, and years of experience in practice. Participants were also asked a series of questions (e.g., true/false, multiple-choice, and case-based) regarding their current knowledge in providing vaccine recommendations for PLWH. This data was collected through *REDCap* (Research Electronic Data Capture), a secure web application for building and managing online surveys.

Following the pre-survey, participants were invited to complete an educational training through an interactive learning management system, *MySimpleShow*, where various patient case scenarios were given to emphasize the key points covered in the ACIP guidelines. After completing the active-learning training session, pharmacists completed the same knowledge assessment as the pre-survey to assess changes in level of confidence in recommending vaccines and vaccine knowledge.

Descriptive statistics were used to summarize pharmacist demographics and overall responses. Differences in responses based on demographics were analyzed with the Chi-square test and Student's t-test as appropriate. Survey data from pre/post-survey included Likert scale questions using a validated survey to assess vaccination knowledge/competencies. This data was matched and analyzed with the non-parametric Wilcoxon signed-rank test for paired data. Statistical significance was assessed at the 0.05 level.

RESULTS:

There was a total of 30 respondents who completed both the pre/post surveys and were included for analysis. An additional response was excluded as they were a graduate student intern, to bring the total n = 29. Of those participating, the majority, 79% (23/29), were practicing in a chain drug store/grocery store/community independent pharmacy, 66% (n=19) were women, 34% (n=10) were men, 41% (n=12) were staff pharmacists, 93% (n=27) did not obtain board certification, and the mean years of practicing pharmacy was 21. Participant demographics are listed in Table 1.

A statistically significant increase in level of confidence in recommending the human papillomavirus virus (HPV) (P=0.003), hepatitis A (P=0.0163), hepatitis B (P=0.0120), measles, mumps, rubella (MMR) (P=0.0140), varicella (P=0.0141), and meningococcal conjugate (P=0.0032) vaccinations were identified pre- versus post-intervention. There was no statistically differences seen in the PCV13, PPSV23, influenza, zoster, and tetanus, diphtheria, whooping cough vaccinations (see Table 2). Using a student's t-test model (see Table 3) to see if the age or number of years of experience modifies the relationship between level of confidence and time point (before vs. after), none of the confidence levels were affected by age or years of experience (all p > 0.05). For survey question 7,

those individuals who received the correct answer after the intervention, had a statistically significant difference identified for the variables of age (50.7 [SD=14]) and more years of experience in the practice of pharmacy (25.3 [SD=13]), respectively; $P=0.0246$ and $P=0.0212$. Additionally, another statistical significance was noted in answering the correct response to question 8 in respondents that were older (68.0 [SD = 4], 67.5 [SD=3]) and with more years of experience (33.0 [SD = 4], 38.3 [SD=7]) before and after the educational intervention, respectively; $P=0.0088$, $P<0.001$ [Age], $P=0.0465$, $P=0.0017$ [Years of Experience]. Lastly, for survey question 9, the average years of experience who got the question correct was 28.0 [SD=13] and older 53.8 [SD=15] answered correctly pre-intervention compared to those who got the question incorrect, respectively; $P=0.0258$ and $P=0.0230$.

DISCUSSION:

This study demonstrated the impact of an increasing the level of confidence in pharmacists providing immunization recommendations to PLWH. Overall, the findings showed an increase in the level of confidence in recommending the HPV, hepatitis A, hepatitis B, MMR, and varicella vaccinations. Across the board for those that are significant, respondents that are older/with more experience tended to get the questions right (true for question 8, the “after” question 7, and the “before” question 9). This suggests that the increased level of confidence is also associated with more practice experience, given with age, when providing immunization recommendations for PLWH.

A significant barrier in the PLWH population was due to the reliable information being given from their health care provider. Providing more up-to-date information to health care practitioners via frequent vaccine education can potentially increase vaccine rates in the PLWH.⁶ Patient outcomes have improved through increased medication adherence, reduced pill burden along with dosing frequency, increased CD4 cell counts, higher rates of viral suppression, and decreases in medication errors by involving pharmacists in the direct care of PLWH.⁷ Additionally, providing adequate documentation and communication of vaccine administration should be completed to assist in overcoming any hurdles with the PLWH.⁸

One of the limitations the study had was the limited sample size. The study incorporated a limited geographical area, including pharmacists only practicing within the state of Illinois. Additionally, the study also demonstrated a relatively short period of time to complete the intervention. Further studies and analysis should be conducted to show the practice behaviors after the educational intervention to measure patient outcomes. One of the drawbacks of the interactive learning management system, is the lack of pharmacy-based studies on the design of this type of continuing education and the effect on pharmacist training and associated patient outcomes. While it may not be feasible to have all pharmacists complete a specialized training course in providing care to PLWH, it may be beneficial for pharmacists to complete a continuing education requirement regarding updates in immunization practice guidelines.

CONCLUSION:

The PROVIDE study, an education learning intervention, was associated with increased level of confidence for community-based pharmacists to further improve the continuum of care for PLWH. The results of this study will continue to promote the potential role pharmacists can embrace in providing care for PLWH beyond medication distribution and counseling. Pharmacists’ activities, such as, helping the team in selecting individualized HIV treatment regimens, providing patient counseling, monitoring for treatment responses, and most importantly preventing HIV related illnesses and death overcome barriers regarding immunization acceptance in PLWH. By implementing educational opportunities for providers, it will assist in identifying patients who are at risk for under-vaccination and understanding the vaccine needs for PLWH.

ACKNOWLEDGEMENTS:

I would like to thank the American Pharmacists Association (APhA) for receiving the the 2021 APhA Incentive Grant sponsored by the APhA Foundation. I also extend my gratitude to the Midwestern College of Pharmacy: Downer’s Grove Campus faculty and staff for their support on this research topic.

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