Pharmacy-Based Immunizers' Comfort Vaccinating Pediatric Patients

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Introduction

The Third Amendment to the Declaration Under the Public Readiness and Emergency Preparedness (PREP) Act for Medical Countermeasures Against COVID-19 temporarily authorized licensed pharmacy personnel to administer Advisory Committee on Immunization Practices (ACIP) recommended childhood vaccinations to children ages 3 years and older without a prescription. This act preceded any state regulations restricting pharmacy vaccination authority[1]. While pharmacies administered 46.4% of pediatric (5-11 years) COVID-19 vaccines in 2020-2021, other routine pediatric vaccinations failed to mirror this shift in vaccination location[2] [Figure 1].

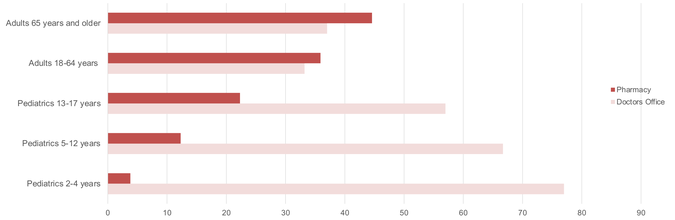

Figure 1. 2020-2021 Influenza Vaccination Locations

Percentages of individuals, separated by age range, receiving vaccinations at pharmacies in comparison to doctor's offices using data compiled from the CDC for the 2020-2021 Influenza season[2]. Suggesting that as age increases, a higher percentage of the population receives their vaccinations at pharmacies.

Literature has recognized several barriers to pharmacy success in administering pediatric vaccines. Inconsistent vaccine coverage by private or public insurance at pharmacies[3] compared to physician offices[4] dissuades parental pursuit. Parents perceive physician offices as the safest vaccination location,[5] but may consider pharmacies with physician referral[6]. However, providers are hesitant to refer due to inadequate patient follow-up and record keeping concerns[5]. Logistical barriers in community pharmacies, lack of private vaccination areas,[6] and understaffing[4] increase adolescent discomfort and injection fears[6].

Administering pediatric (≥ 3 years) and adult vaccines is similar in terms of technique and anatomical location,[7] yet literature suggests lower pharmacy personnel comfort when administering these vaccines[5].

Objectives

- Evaluate the comfort level of California pharmacy-based immunizers administering pediatric versus adult vaccinations.
- Compare the demographic traits of comfortable versus uncomfortable pharmacy-based immunizers vaccinating children of various age groups.
- Identify barriers influencing pharmacy-based immunizers' comfort in vaccinating individuals younger than 17 years.
- Determine which pediatric vaccines are most commonly administered by pharmacy-based immunizers.

Methods

Inclusion Criteria

- California licensed pharmacists, pharmacy technicians, or pharmacy interns
- Worked in the community pharmacy setting within the last five years and provided vaccinations
- Pharmacy interns were included if they provided vaccination during a community rotation

Online Qualtrics®

- IRB-approved (IRB-23-94) cross-sectional study
- Anonymous and confidential survey was designed, beta tested, and distributed from November 2022 to February 2023 via email to CSHP, CPHA, and CAPSLEAD rosters and social media to professional networks

Data Analysis

- Results were transposed into Excel to be used in RStudio for statistical analysis
- Fischer's exact test provided 95% confidence intervals (CIs) and *P* values
- Continuous data utilized Wilcoxon rank sum test

Results

Characteristics	*P* value
Profession	0.865
Pharmacist work experience	**0.0473**
Semesters/trimester completed by pharmacy student	0.287
Pharmacist vaccinating experience	**0.0145**
Post graduate training	**0.0241**
Self describe	**0.0417**
Current pharmacy type employed at	**0.0417**
Training specifcally for young children	**0.0149**

Table 1. *All baseline characteristics exhibited statistically significant differences (bolded) except profession and semesters/trimesters completed by pharmacy students.*

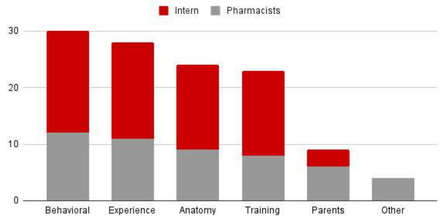

Figure 3. Barriers Affecting Comfortability

Behavioral barriers affect the comfortability of both pharmacists and pharmacy interns more than the other suggested barriers.

	Behavioral	Experience	Anatomy	Training	Parents	Other
>18	0.17%	0.35%	0.09%	0.17%	0.00%	0.09%
11-17	1.90%	1.64%	0.69%	1.04%	0.78%	0.26%
5-10	6.91%	4.32%	3.54%	3.03%	1.73%	0.35%
3-4	9.68%	7.52%	6.66%	5.53%	2.59%	0.86%
<3	10.54%	9.94%	7.78%	7.26%	3.54%	1.04%

Table 2. *Behavioral barriers had the greatest percentage of lack of comfortability from conducted surveys followed by experience, anatomy, training, parents, then other barriers.*

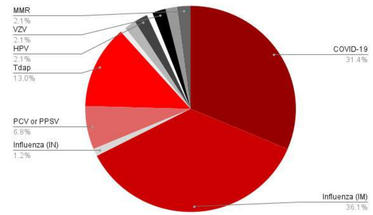

Figure 2. Frequency of Vaccines Administered

Influenza *(IM), COVID-19, and Tdap are among the top three vaccines most frequently administered by pharmacists and pharmacy interns.*

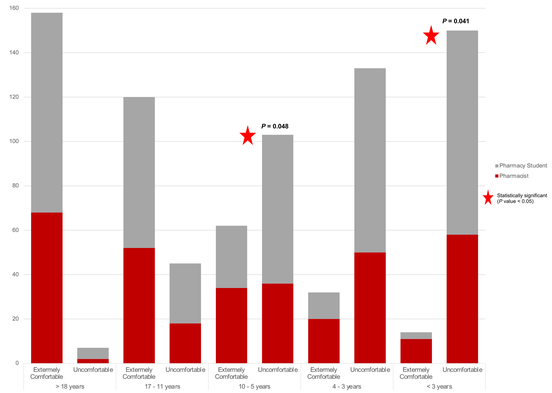

Figure 4. Comfortability of Administering Vaccines by Age

*There is a statistically significant difference in comfortability for vaccination of those under 3 years old (*P *= 0.041) and 5-10 years old (*P *= 0.048) of pharmacy interns compared to pharmacists as indicated by the stars.*

Discussion

- Pharmacy-based immunizer comfort in administering pediatric vaccines differed in a statistically significant (*P* value < 0.05) manner across all baseline characteristic categories except profession and number of semester/trimesters completed by pharmacy students [Table 1]. This suggests that experience heavily influences comfortability during pediatric vaccination more so than didactic learning.
- All pharmacy-based immunizers identified behavior as the largest impact on comfort levels [Figure 3]. This suggests that pediatric related behaviors poses the most prominent barrier during pharmacy-based vaccination and not other pediatric related factors. Training aimed at increasing competence of pediatric immunizer's should focus on common pediatric behaviors to overcome and not just limited differences in administration.
- Overall, pharmacy-based immunizers' comfort only statistically differ between age groups of pediatric patients under the age of 3 and between ages 5-10 [Figure 2]. This suggests that pediatric patient age below 10 years old poses as a barrier to vaccination comfortability, requiring training that recognizes the different developmental stages of children instead of grouping all pediatric patients into one category.
- **Study limitations**. First, prior vaccination experience of pharmacy interns was not accounted for, such as prior work experience as pharmacy technicians, possibly confounding comfortability with pediatric vaccinations. Second, only five pharmacy technicians participated in our survey preventing sufficient evidence to determine the comfortability of pharmacy technicians. Third, answering demographic questions were not required by survey participants resulting in limited participation.

Conclusion

- Pharmacy-based immunizers are less comfortable vaccinating pediatric patients in comparison to adult patients. Concurrent with existing literature an apparent difference in comfortability exists despite similarities in vaccination techniques for pediatric vaccination.
- Among barriers regarding behavior, experience, anatomy, training, parents, or other barriers, behavioral barriers affected the comfortability in administering pediatric patients the most.

References

1. Azar II, A. M. (2020). Third Amendment to Declaration Under the Public Readiness and Emergency Preparedness Act for Medical Countermeasures Against COVID–19. 85(164), 52136-52141.
2. Centers for Disease Control and Prevention. (2021). Influenza (Flu): General Population Vaccination Coverage. U.S. Department of Health & Human Services.
3. Cartmell KB, Young-Pierce J, McGue S, Alberg AJ, Luque JS, Zubizarreta M, Brandt HM. Barriers, facilitators, and potential strategies for increasing HPV vaccination: A statewide assessment to inform action. Papillomavirus Res. 2018 Jun;5:21-31.
4. Calo, W. A., Shah, P. D., Gilkey, M. B., Vanderpool, R. C., Barden, S., Doucette, W. R., & Brewer, N. T. (2019). Implementing pharmacy-located HPV vaccination: findings from pilot projects in five U.S. states. Human vaccines & immunotherapeutics, 15(7-8), 1831–1838. https://doi.org/10.1080/21645515.2019.1602433
5. Omecene, N. E., Patterson, J. A., Bucheit, J. D., Anderson, A. N., Rogers, D., Goode, J. V., & Caldas, L. M. (2019). Implementation of pharmacist-administered pediatric vaccines in the United States: major barriers and potential solutions for the outpatient setting. *Pharm Pract (Granada)*, *17*(2), 1581. https://doi.org/10.18549/PharmPract.2019.2.1581
6. Teeter BS, Jensen CR, Thomas JL, Martin BC, McElfish PA, Mosley CL, Curran GM. Perceptions of HPV vaccination and pharmacist-physician collaboration models to improve HPV vaccination rates. Explor Res Clin Soc Pharm. 2021
7. Advisory Committee on Immunization Practices (ACIP). (2022). General Best Practice Guidelines for Immunization: Vaccine Administration.
8. Daniel CL, Lawson F, Vickers M, Green C, Wright A, Coyne-Beasley T, Lee HY, Turberville S. Enrolling a rural community pharmacy as a Vaccines for Children provider to increase HPV vaccination: a feasibility study. BMC Public Health. 2021 Jun 29;21(1):1266. doi: 10.1186/s12889-021-11304-8. PubMed PMID: 34187438; PubMed Central PMCID: PMC8240772.