Disparities in the Use of Immunization Services Among Underserved Minority Patient Populations and the Role of Pharmacy Technicians: A Review

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Abstract

Objective: To provide a review of the issues surrounding the lack of use of immunizations and immunization services among underserved minority patients and outline the role of pharmacy technicians in facilitating the utilization of vaccination services. **Data Sources:** Articles were identified through searches in May 2017 using MEDLINE/PubMed (1946-2017) with the following search terms: pharmacy technicians, immunizations, and pharmacy-based immunization services. Articles were also identified utilizing search terms such as “immunization disparities.” Additionally, immunization data and vaccination resources from government websites such as the Centers for Disease Control and Prevention and the US Department of Health and Human Services were used. **Study Selection and Data Extraction:** Articles and reports that discuss the challenges and barriers associated with use of vaccinations in minority patient populations were considered for inclusion. Additionally, literature that report challenges in community pharmacy where pharmacy-based immunization services provide less vaccinations to minority patients compared to other patient populations were reviewed. **Data Synthesis:** Cross-sectional studies that provide insight into vaccine disparities were reviewed. Roles for pharmacy technicians are highlighted that include nurturing relationships with their patients and engaging patients about vaccines during service provision. **Conclusions:** Pharmacy personnel, including pharmacy technicians, are in a position to reduce barriers associated with disparities in the uptake of immunization services in the community pharmacy setting.

Keywords

technician education training, vaccines, immunizations, infectious disease, standards of practice

Introduction

Despite our efforts to improve vaccination coverage among adults in the United States, immunization rates remain sub-optimal. During each decade, national immunization goals are reported in the Healthy People report, which is a science-based initiative to improve the health of US citizens.¹ Currently, goals in Healthy People 2020 include increasing the percentage of adults aged 18 and older vaccinated against seasonal influenza to 70%; however, our current rates are at 41.0% according to the 2015 National Center for Health Statistics Report (Table 1).¹ This low level of vaccine coverage also exists for adults aged 18 to 64 that should receive pneumococcal vaccine and herpes zoster vaccine. On further examination, it is evident that some populations receive vaccinations at a level below other populations. For instance, 31% of Hispanic individuals received influenza vaccine in 2014 compared to 34.4% of African American and 46% of White Americans.¹ This difference is also apparent in populations that receive pneumococcal and herpes zoster vaccines.² These differences represent disparities in the use of nationally recommended vaccines.

Updated standards implemented by the National Vaccine Advisory Committee in 2013 emphasized the need for more collaboration among health care providers and expanded access to improve vaccination rates.³ Nationally, community pharmacists and pharmacy technicians increased the capacity to deliver vaccinations in pharmacies due to broadened legal authority in state pharmacy practice acts and the implementation of training programs for practicing pharmacists and pharmacy students.^{4,5} As of 2009, all states allow pharmacists to vaccinate in varying capacities, and several published reports claimed that pharmacy-based immunization services delivered considerable amount of vaccines in certain communities.⁶ For example, Murphy and colleagues reported that pharmacists in medically underserved areas delivered one third of influenza vaccines during the 2009-2010 influenza

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Table 1. Vaccination Goals and Vaccination Rates¹.

Vaccination Goals	Influenza	Herpes Zoster	Pneumococcal Disease
Healthy People 2020 goal (adults age 18-64)	70%		60%
Healthy People 2020 goal (older adults age >65)	70%	30%	90%
Vaccination coverage rates (2013)			
US adult population (18-64)	37.70%		21.00%
US older adult population (>65)	73.50%	24.20%	59.70%
African American adults (18-64)	37.40%		20.80%
African American adults (>65)	N/A	10.60%	48.40%
Hispanic adults (18-64)	33.30%		17.70%
Hispanic adults (>65)	N/A	9.50%	39.20%
White adults (18-64)	45.60%		21.60%
White adults (>65)	N/A	25.80%	61.70%

season.⁵ Additionally, patients were satisfied with pharmacy-based immunization services due to expanded access after-hours and reduced wait times. Promotion of pharmacy-based immunization services are in line with efforts by the Centers for Disease Control and Prevention (CDC) and National Vaccine Advisory Committee, which ultimately aim to improve vaccination rates in adults patients.

Expansion of pharmacy-based immunization programs should be attributed in part to pharmacy technicians and the expansion of their roles in pharmacy.⁷ Roles outlined for pharmacy technicians in immunization services include areas of documentation, billing, reporting adverse reactions, facilitating communication, and obtaining additional certifications.⁸ Pharmacy technicians often greet patients first in the pharmacy and provide education about vaccines. Recently in 2016, the pharmacy technician scope of practice was expanded to allow registered and certified pharmacy technicians in Idaho to administer vaccines under the direct supervision of a pharmacist. This dramatically changes the role of the pharmacy technician from simply vaccine advocates to actual providers of vaccines.

Even though the availability of vaccines in the pharmacy have grown, not all pharmacy patrons receive vaccinations at the same level. Wang et al analyzed data in the Medicare Expenditure Panel Survey and reported that a larger proportion of White community pharmacy patrons 50 years of age and older received influenza vaccinations compared to African American (60.9% vs 49.1%; $P < .0001$) and Hispanics (60.9% vs 51.0%; $P < .0001$).⁹ These differences represent disparities in the use of pharmacy-based immunization services, which are similar to trends seen in vaccine use nationally. The objectives of this study are to inform pharmacy technicians about the disparities to the use of vaccines nationally, reasons for disparities, and discuss interventions aimed to reduce immunization disparities. Additionally, we will outline roles for pharmacy technicians in the reduction of immunization disparities.

Data Sources

PubMed (1946-2017) and Web of Science (1950-2017) were reviewed with the following search teams: “immunization disparities,” “pharmacy technicians,” “immunizations,” and “pharmacy-based immunization programs.” All searches were conducted in May 2017. Additionally, authoritative resources on vaccines from the CDC and US Department of Health and Human Services, which hosts websites such as vaccines.org were reviewed. Articles that specifically discussed vaccination services and pharmacy technicians were reviewed and were considered for inclusion as appropriate. Review of literature that describe disparities to the use of vaccines are extensive and our goal was not to provide a scoping review. Our goal was to find literature representative of the problem and to highlight roles specific for pharmacy technicians in addressing this problem, which is a priority in preventative healthcare.

Disparities and Immunizations

The term “health disparity” has been used in the United States to describe a difference in the environment, access to utilization of, and quality of care, health status, or a particular health outcome among populations.¹⁰ Although many efforts have focused on the elimination of racial and ethnic health disparities, disparities exist in multiple contexts including age, gender, social class, and sexual orientation.¹¹ Racial and ethnic disparities present a major problem nationally, especially with the shifts of demographics occurring in the United States. It is estimated that by 2050, racial “minority” groups such as Hispanics and African Americans will make up the majority of the population. In 1999, The US Congress commissioned a key report by the Institute of Medicine titled “Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care,” which discussed variations in the rate of medical procedures by race when results were controlled for insurance status, income, age, and severity of conditions.¹² Results

indicated that minority patients are less likely to receive appropriate cardiac medications, undergo bypass surgery, and are less likely to receive kidney dialysis or transplants. Furthermore, it was reported that minority patients were more likely to receive less desirable interventions such as limb amputations due to uncontrolled diabetes.¹²

In 2002, the National Foundation for Infectious Diseases released "A Report on Reaching Underserved Ethnic and Minority Populations to Improve Adolescent and Adult Immunization Rates," which describes barriers to the use of immunization among minority patients.¹³ One barrier highlighted included the lack of knowledge among health care providers and consumers on the need and benefit of adult immunizations. Due to various functions and responsibilities of pharmacists and pharmacy technicians in the medication distribution process, it can be challenging to stay current on immunization use and best practices. Lack of awareness among health care providers about immunization disparities is another barrier that plagues practice settings. Cultural and language differences between patients from racial and ethnic groups and their White health care providers can create distrust and lack of understanding on the advantages of vaccinations.^{12,14} The notion that adults bear the ultimately responsibility for their health, even in underserved communities, led to less outreach efforts for vaccines for adults compared to children. Within the report, it was concluded that despite barriers that facilitate disparities, strategies moving forward include becoming more aware of disparities that exist in our communities and taking relevant action to reduce them.¹²

Lack of insurance coverage for vaccines prior to the implementation of the Affordable Care Act led to less use of vaccines. It was common for studies to cite the lack of insurance as a primary reason for low vaccination rates in minority patient populations.^{15,16} Recently, insurance coverage for vaccinations have expanded, although coverage levels vary and not all plans include pharmacists as vaccine providers. Islam and colleagues surveyed pharmacists from 8 states about opportunities and challenges of adolescent and adult vaccination administration within pharmacies and half of the pharmacists reported difficulty in determining if patients are eligible for vaccine coverage through insurance.¹⁷ Additionally, 13% of pharmacists reported being unable to administer the vaccine due to not being a provider in the plan and had to refer the patient to a physician.¹⁷ It is now recommended that employers demand changes in insurance benefit design to cover pharmacy-based immunization services for all beneficiaries.¹⁸ This may help decrease disparities in underserved communities that have shortages of primary healthcare professionals.

Reasons for Disparities

Redelings et al conducted a cross-sectional survey examining knowledge, beliefs, and attitudes about the H1N1 vaccination

among low-income adults.¹⁹ This was conducted when a pandemic strain of influenza prompted the Advisory Committee on Immunization Practices to recommend use of an H1N1 monovalent vaccine to the general population in 2009. Local health departments were tasked with disseminating the vaccine to individuals quickly and known factors that contribute to racial and ethnic disparities in annual influenza vaccine coverage were likely to be reflected in uptake of the H1N1 vaccine. In response to this concern, the Los Angeles County Department of Health conducted surveys at 5, large low-income public health centers to better identify and understand barriers to use of vaccinations. The public health centers included in the study were located in impoverished areas of Los Angeles with more overcrowded housing (32% vs 23%) and a higher poverty rate (26% vs 15%) than other parts of the county. A total of 1541 patient completed the survey and most were Latino (44%) or Black (33%). About 21% of participants reported that they received the H1N1 vaccine in the previous 12 months. Fifty-two percent of the survey respondents were unemployed and only 15% had at least a bachelor's degree. Patients who did not trust their doctors' or clinicians' recommendations were less likely to report receiving an H1N1 vaccine compared to individuals that did trust their providers' recommendations (odds ratio [OR] = 0.2, 95% confidence interval [CI] = 0.1-0.5). Participants that believed the vaccine did not cause them to be sick (OR = 1.7, 95% CI = 1.2-2.4) or contained dangerous chemicals (OR = 1.5, 95% CI = 1.0-2.1) were more likely to receive the vaccine than those that believed it did cause harm. Among men and women, increasing age was associated with receipt of the vaccine ($P < .001$). Black participants were less likely to receive the vaccine overall compared to non-Black participants (OR = 0.7, 95% CI = 0.6-1.0) or agree that they trust doctors/clinicians that recommend vaccines (OR = 0.5, 95% CI = 0.4-0.7). Predictors of individuals that received an H1N1 vaccination include those that trusted their health care provider's advice about vaccines and those that received yearly doses of annual influenza vaccine. The results of this study also highlight disparities in use of vaccines among Black participants. Concerns of safety and efficacy contributed to these findings as well as misbeliefs. The study authors recommended effective educational interventions to address disparities and dispel myths about vaccines.

Frew et al conducted a survey among ethnically diverse populations in the south to determine factors associated with acceptance of both the seasonal and influenza A (H1N1) vaccines.²⁰ Disparities related to H1N1 exposure, health access, illness complications, and H1N1 vaccine uptake were noted which sparked the necessity of creating a study to assess factors with vaccine acceptance. Venue-based sampling was used to recruit up to 480 English- and Spanish-speaking racial and ethnic minority persons 18 years of age and older. The survey was designed to assess vaccine acceptability, demographic and behavioral correlates, and psychosocial

correlates such as immunization attitudes, vaccine attributes, community perceptions, and health status. Of 503 study participants, the mean age was 37.4 and all were non-White minorities including African Americans (79.3%), Hispanics/Latinos/Chicano (6.2%), multiracial (5.6%), Asian (2.4%), and Native American Indians (1.2%). Study participants reported a larger likelihood of receiving H1N1 vaccine than seasonal influenza vaccine ($P = .005$). Fifteen percent of participants had been vaccinated against the seasonal influenza vaccine in the previous 3 months. The overall acceptance of the seasonal influenza vaccine was 39% with those that disagreed with conspiracy theories more likely to display positive acceptance of the vaccine (OR = 1.53, 95% CI = 1.16-2.01). Receipt of a seasonal influenza vaccine within the previous 5 years was associated with higher acceptance of a future influenza vaccine (OR = 3.53, 95% CI = 2.16-5.78) and the belief that churches ($P = .004$) and grocery stores ($P = .02$) would be good places to receive vaccinations in the future. Acceptance of the H1N1 vaccine was associated with a greater belief that a physician could influence the decision to receive influenza vaccine (OR = 1.94, 95% CI = 1.31-2.86). Health insurance status and educational attainment were not associated with high acceptance of seasonal influenza vaccine. Discussion points from this study highlight how there are negative vaccine attitudes combined with poor experiences with health care providers contributes to reduced uptake of influenza vaccinations. There are those that are skeptics that may be difficult to recruit for vaccinations; however, those on the fence may be influenced by providers and "opinion leaders" in the community that champion immunization efforts. Individuals that receive a vaccination at least once are more likely to receive them in the future.

Boggavarapu and colleagues performed a cross-sectional study to analyze the institutional and cultural influences of church on the use of annual influenza vaccination among older African Americans.²¹ Study participants included self-identified African American individuals between 50 and 89 years of age that resided in the Atlanta, GA, community. Participants enrolled in the study were surveyed at baseline, 3 months, and 6 months between January 2013 and May 2014. The primary outcome included receiving an influenza vaccine during the 2012-2013 influenza season. A logistic regression model was created and various independent variables were assessed including sociodemographic characteristics, discrimination measures, perceived provider relationship quality, attitudes toward spirituality, and access to transportation. Two-hundred and eight participants performed the follow-up surveys and had usable data for analysis. The multivariable logistic regression found a strong association between trust with health care providers and discrimination in a faith-based setting (OR = 14.8, 95% CI = 3.7-59.8). In the absence of discrimination in the faith-based setting, trust in the health care provider was strongly associated with receipt of vaccination. For participants that perceived discrimination in a

faith-based organization, trust in a health care provider was not associated with receipt of a vaccination (OR = 1.5, 95% CI = 0.3-7.0). The results of this study reveal how individual experiences in cultural institutions such as church can contribute to the relationship between patients and providers. It can also influence the decision to receive a vaccination among members of a particular group. It may be advantageous for providers such as pharmacists and pharmacy technicians to connect with community members from religious institutions to develop an understanding of beliefs with regard to use of preventive health services.

Roles for Pharmacy Technicians

It has been reported that although pharmacy improves accessibility and flexibility to obtaining vaccines, immunization rates have not improved due to adding pharmacy in the vaccine arena.²² Goals of pharmacy-based immunization services include improving access to vaccines and at the same time improving the overall vaccination rate for all vaccine-preventable diseases. Meeting these goals require the appreciation of disparities, which have a multitude of causes related to structural barriers in the health care system, differences in cultural beliefs about vaccines, and practices of vaccine providers. Pharmacy technicians are often the first individuals that greet patients when they come to retrieve prescriptions and learn about services offered at the pharmacy. In this section, we will highlight roles for pharmacy technicians to help reduce disparities to the use of vaccines in the pharmacy.

Become Competent in Culturally and Linguistically Appropriate Care

It is important for health care providers, including pharmacy technicians, to develop an understanding of the people and communities they serve. When working to promote pharmacy services, including pharmacy-based vaccination programs, it is recommended pharmacy staff consider the views and cultural beliefs of individuals that reside in that particular community. Beliefs may vary among ethnic and racial groups but they also may vary among people in a geographic location. The practice of cultural competency can help bridge the gap when discussing personal matters of health and wellness when differences of opinions arise. Cultural competency is defined as a set of behaviors, attitudes, and policies that come together among professionals that foster effective interactions in a cross-cultural framework.²³ Learning to provide culturally competent care is a priority for health professions because the demographics of patients served are changing rapidly. It may not be natural to use these skills intuitively so it is recommended pharmacy technicians use evidence-based resources developed by entities such as the CDC, the Infectious Disease Society of American, and the National

Foundation for Infectious Diseases to learn about cultural competency related to the promotion of vaccines.

Although there are many outside factors that affect patients' decisions to receive vaccinations, interactions with providers, including pharmacy technicians, can have an impact on these decisions. Various reports and studies highlight how trust is a major factor for individuals when deciding whether or not to get a vaccine. Pharmacy technicians are in a key position to develop trustworthy relationships with patients by providing services under the direction of a pharmacist. Some services already provided by pharmacy technicians include blood pressure and blood glucose screenings. In Idaho, pharmacy technicians are providing direct administration of vaccines under the supervision of a pharmacist. A pharmacy technician often represents a familiar face at the pharmacy that provides assistance with products and services offered in the pharmacy. As pharmacy technicians continue to provide these services within the pharmacy, the public will recognize pharmacy technicians as trustworthy in recommending and administering vaccines. When patients develop a trustful relationship with their provider, they are more likely to listen to recommendations on vaccinations.²⁴ Overtime, this relationship can be leveraged to provide education and facts about vaccinations. This can lead to more encounters with the individual to provide vaccinations.

Document Attempts to Recommend Vaccinations

It has been reported that pharmacy technicians are essential in the general documentation and billing of immunization services.⁸ Pharmacy technicians may also be on the front lines of recommending vaccines to individuals when they come to retrieve prescriptions. As mentioned in the study published by Frew and colleagues, there are individuals who may always refuse vaccinations; however, there are some individuals that are ambivalent and need more information that is convincing before they decide to take their first vaccine.²⁰

Keeping track of patients that refuse vaccination services can lead to other efforts to engage these individuals. This can involve mailing literature about vaccinations or even inviting individuals to informational sessions in the community where health matters are discussed. Efforts to improve vaccine use in the community can be enhanced by leaders in the community that support use of immunizations and can provide an influential nudge to people who are unsure about receiving a vaccine. Triaging patients to all available resources in the community can provide the necessary knowledge needed among individuals who are more "undecided" about the use of vaccines rather than those who are "resistors" of vaccines. As discussed in Frew et al, patients that receive at least one vaccination may become more susceptible to receiving a future vaccination.

Bridge Discussion of Vaccinations in Other Pharmacy Services

Commonly, pharmacy staff will briefly ask patients if they are interested in vaccination services when they are picking up prescriptions. This can be an effective way to engage patients initially; however, other times may provide opportunities to engage with patients about vaccines. Examples include during the performance of blood pressure and blood glucose screenings. These are times when patients are engaged in preventative health behaviors and discussion about vaccine use is appropriate. Additionally, pharmacists and pharmacy technicians can use medication therapy management appointments to perform vaccines assessments and recommend vaccines appropriate for patients.

Summary

Although overall use of vaccines among adults are low, there are opportunities in pharmacy to help improve vaccines use. Knowledge about the disparities in use of vaccines among ethnic minority patients is essential to eliminating disparities and creating pharmacy-based immunization practices that are effective in addressing barriers in these specific patient populations. Pharmacy technicians are key in helping improve vaccines use in pharmacies because patients have familiar bonds with them, which engenders trust in the pharmacy. It is recommended pharmacy staff, including pharmacy technicians, adopt cultural competency training to address disparities in use of vaccinations in the pharmacy among ethnic minority patrons.

Declaration of Conflicting Interests

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