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# Ohio pharmacists' provision of non-dispensing services to underserved populations : involvement, willingness, capabilities, and barriers to care

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A Thesis

entitled

Ohio Pharmacists' Provision of Non-Dispensing Services to Underserved Populations:

Involvement, Willingness, Capabilities, and Barriers to Care

by

Lucas M. Blazejewski

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the

Masters of Science Degree in Administrative Pharmacy

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August 2012

An Abstract of

Ohio Pharmacists' Provision of Non-Dispensing Services to Underserved Populations:
Involvement, Willingness, Capabilities, and Barriers to Care

by

Lucas M. Blazejewski

As partial fulfillment of the requirements for the Masters of Science Degree in
Administrative Pharmacy

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Background: The number of US citizens that are struggling to access care is steadily increasing. Medically underserved populations tend to suffer from increased health complications as a result. Pharmacist may increase health care access by providing non-dispensing services, which have shown to be effective improving patient health. Little information exists that describes pharmacists' involvement in providing care to underserved populations and their potential to grow in this role. Objectives: 1.) To measure the proportion of pharmacists that frequently provide non-dispensing services to underserved populations in the State of Ohio 2.) To identify which factors either environment or personal that pharmacists' feel most prevent the provision of non-dispensing services underserved populations 3.) To identify environmental or personal factors that predict pharmacists' provision of non-dispensing services to underserved populations 4.) To assess if pharmacists are willing to work with underserved patient populations with different characteristics, provide specific non-dispensing services, and provide disease state management for different diseases 5.) To assess if pharmacists perceive themselves capable to work with underserved

patient populations with different characteristics, provide specific non-dispensing services, and provide disease state management for different diseases. Methods: A cross-sectional survey was designed based on the Social Cognitive Theory to assess pharmacists' provision of non-dispensing services to underserved populations and mailed to 2,000 pharmacists between December 2011 and March 2012. Descriptive and logistic regression analyses were run to determine pharmacists' involvement with underserved populations, their willingness and capabilities to provide services to underserved populations, and barriers to providing care. Results: 363 pharmacists responded for a response rate of 19.7%. Currently, 43% of pharmacists provide some form of non-dispensing service to underserved populations. In general, 50%-75% of respondents were willing and 18.7%-60.9% were capable providing a variety of non-dispensing services to a variety of underserved populations. Analysis of barriers to providing care indicated work place and volunteering barriers more responsible for pharmacists not providing care to underserved populations. Conclusion: Personal factors did not cause many barriers to providing non-dispensing services to underserved populations and most pharmacists appeared to be willing and/or capable. Communication between organizations that provide services to underserved populations and pharmacists or their employers may need to be improved to increase pharmacist participation.

For my biggest fans, most avid supporters, and foundation- my parents. Without you,

none of this would have been possible.

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# Chapter 1

# Introduction

This chapter introduces the issues of medically underserved individuals in the United States (US) health care system. It discusses the health problems experienced by this segment of the US population and the primary causes of their health problems. This section will also introduce the current status of the health professional workforce in regards to providing care to underserved populations. A specific focus will be on the shortages in primary care services experienced by the underserved populations and the utilization of pharmacists to address their needs.

## 1.1  Medically Underserved Populations

In the United States, a large number of citizens struggle to receive adequate health care. Two predominate barriers to care are lack of health insurance and shortages of health care professionals. Patients lacking health care insurance are a large underserved segment of the US population. The number of uninsured Americans has been steadily increasing over the last decade.[1] Mostly due to the current recession, large decreases in private based health insurance coverage has led to 50.7 million or 16.7% of the American population uninsured compared to 46.3 million people or 15.4% of the US population in

2008.[2] Annual insurance rates do not always convey the extent of the problem. Over a multiple year period of time more people experience no coverage periods of varying length due to changing economic, demographic, and labor dynamics. A study that evaluated insurance coverage from 2004 to 2005 found that 31% of non-elderly people experienced at least one month without health insurance coverage.[3]

Low income, uninsured, and minority populations are disproportionately affected with problems accessing care.[4] Minorities represent 78% of the uninsured population, Hispanics (32.4%) being the largest minority group suffering from lack of coverage.[2] Household incomes below $49,999 account for 48% of the uninsured and those with household incomes below $25,000 baring the largest burden of 26.6%.[2] Individuals' ages also have an impact on insurance coverage. Younger adults disproportionately experience lack of coverage. Adults ages 18-24 and 25-34 have the lowest percentage of health care coverage at 30.4% and 29.1% respectfully.[2]

Having insurance does not ensure sufficient access to health care. A number of US citizens with private insurance struggle to access care as well. These individuals have insurance coverage but cannot afford the expenses associated with their coverage plan or may have reached the maximum or lifetime caps on their current plans. Employer-sponsored coverage has a lot of variation in the amount of out-of-pocket expenses employees have to pay, such as deductibles, cost-sharing, prescription coverage, and dental and vision services.[5] Many low to moderate income families struggle paying these out-of-pocket expenses, which prevents them from seeking care.[5]

Many geographic areas, special populations, and public facilities are experiencing a shortage of health professionals. HRSA designed a system to identify health professional

shortage areas (HPSA); areas lacking health resources, especially in the area of manpower. Using this system, federal and state governments address shortage areas by increasing the allocation of resources to meet the needs of populations.[6,7] As of November 2010, HRSA identified 6,355 primary care HPSAs.[8] There are 66.4 million medically underserved people residing in the identified shortage areas for primary care. For example, rural areas contain 21% of the US population, but 9% of the physician workforce.[9] A population-to-practitioner ratio of 3,500:1 is required to remove the designation of HPSA. Currently, 7,267 physicians are required to satisfy the basic manpower needs of all HPSAs in the US. HRSA strives to reach a target ratio of 2,000:1, however, which would require 17,278 practitioners.

The demographics of regions can strain the health care resources that are available. Inner city and rural areas are more likely to have higher populations of uninsured and Medicaid patients that suffer from a lack of available primary care services.[10] The populations in these areas tend to have higher prevalence of poverty, uninsured individuals, and an increased proportion of public insurance coverage.[9,11] Having high concentrations of underserved populations creates a large burden on the practitioners and medical institutions that are available to provide care.[12] Serving Medicaid and uninsured patients usually results in partial payment for services or uncompensated care causing loss of revenue and financial stress on the health care institutions and providers. Medicaid and Medicare patients in areas where reimbursement is below private insurance market rates struggle to access physicians because the physicians restrict the number of publicly insured individuals they serve.[13]

### 1.1.1  Health Problems Experienced by Underserved

Access to care, specifically primary care, has been identified as one of the largest predictors of health status. Patients can be limited to access either by financial reasons or through distribution of health professionals and services. A report by the Institutes of Medicine in 2002, found that individuals without health insurance suffer from increased health complications.[14] These patients receive too little medical care to late in the progression of their illness, they tend to be more sick and die sooner compared to the insured segment of the population, and receive poorer care when hospitalized.[14]

A large issue faced by the uninsured population is access to necessary screening and preventative services. For example, uninsured women have a 30% to 50% higher risk of dying from breast cancer than women with coverage due to lack of timely screenings.[14] Uninsured individuals with chronic diseases also struggle to access the care they need. In 2003, almost half of all uninsured adults had a chronic disease.[15] Approximately, 54% of uninsured adults have no usual source of care compared to 10% of patients with different types of coverage.[1] Patients with chronic diseases are less likely to have routine checkups and the medication needed to manage their disease.[14] Typically, uninsured patients with chronic diseases experience lower clinical outcomes than insured patients.

Due to the cost of care, 26% of uninsured adults in 2006 reported postponing the use of medical services compared to 6% of insured patients.[1] As a result, most uninsured patients have a greater risk of poor health outcomes when they do seek care.[14] They often seek care in emergency departments which are less effective and more expensive than seeing a primary care physician.[16] When patients' conditions require inpatient care, they

receive fewer needed services, worse quality care, and have a greater risk of dying in the hospital or shortly after discharge.[14]

The health issues faced by other underserved populations are similar to the problems faced by the uninsured; delays in care, inconsistent care for chronic diseases, lower utilization of preventative services, and lower chances of successful health outcomes due to seeking treatment with a poor health status.[17-19] Residing in a HPSA is predictive of worse health status and decreased access to health services except for inpatient care.[17] Rural patients may experience delays in care or have to travel longer distances than urban populations to access care. This can serve as a barrier to care for these populations which may cause postponing medical services.

## 1.2 Health Professionals Influence on Access to Care for Underserved Populations

### 1.2.1 Physicians

Primary care physicians are the providers that are heavily relied upon to deliver care to the general population. While physicians in this discipline are in highest demand, medical students are choosing to enter specialty areas instead of internal or family medicine. From 1997 to 2006, the number of medical graduates choosing family medicine declined from 2340 to 1132 and the percentage of internists entering primary care decreased from 54% to 20% over the same period.[20]

The shortage has created barriers to access for all patients. In 2006, a national survey indicated that only 27% of Americans (ages 18 to 64) said they could easily reach their provider over the phone, received medical advice after hours, and their office visits

were often well organized and running on time.[21] For uninsured and patients receiving public health insurance, the shortage of primary care physicians becomes more than an inconvenience. In 2008, 30% of Medicare patients reported trouble finding a primary care physician, which is a 17% increase since 2006.[22] The percentage of uninsured patients that reported accessing routine medical care decreased from 68.6% in 1996 to 63.1% in 2003. [23]

Research on medical students and practicing primary physicians reveal many factors determine the location physicians practice, their chosen medical discipline, and the type of practice they join. In most cases, their selection criteria do not favor underserved areas or populations. First, medical students are more attracted to specialty disciplines because of reimbursement and remuneration, medical technology, and specialty-oriented medical education.[10] Secondly, more physicians tend to concentrate in metropolitan and suburban areas than in inner city urban and rural areas due to greater prospects for high income, professional interaction, access to modern facilities and technology, availability of continuing education and professional growth, higher standards of living, and more social amenities.[10] Lastly, more physicians are seeking employment in large physician groups, hospitals, and medical schools.[23] Approximately, 80% of physicians with solo practices or smaller groups provide discounted or free care to uninsured populations compared to 60% of large practices, hospitals, and medical schools.[23]

## 1.2.2  Nonphysician Clinicians

While the supply and availability of primary care physicians is decreasing, other health care professionals are showing to be effective care providers to underserved individuals. Nonphysician clinicians (NPCs) are clinical professionals who practice in many areas similar to those in which physicians practice, but do not have a Medical Doctorate (MD) or Doctor of Osteopathic Medicine (DO) degree. NPCs that provide primary care services are often physician assistants (PA), nurse practitioners (NP), and pharmacists.

Each type of healthcare professional has shown to increase access to primary care for uninsured and underserved populations and provide effective care.[24-26] Physician assistants have shown to increase care to individuals in rural areas and serve more patient's paying out of pocket than individuals with insurance.[26] Nurse practitioners' role has expanded as far as nurse-managed health centers (NMHC), which are staffed by advanced practice nurses. Currently, there are 250 NMHCs which field 2.5 million patient visits each year with the capacity for more.[27] These health centers serve patients who struggle to access care; usually the uninsured, underinsured, or impoverished members of the community. NMHCs are recognized by community members as high-quality, cost-effective places to receive care with high patient satisfaction.[28]

### 1.2.2.1    Pharmacists

Over the last 20 years, pharmacists' role in the community has expanded from primarily dispensing to include the provision of clinical services as well. Due to pharmacists' education and training, they can provide clinical expertise, unique insights,

and beneficial recommendations regarding medication use/ monitoring and patient

management that result in improved patient outcomes.[29] The concept was first defined as

pharmaceutical care by Hepler and Strand in 1990.[30] Pharmaceutical care was defined as

the responsible provision of drug therapy for the purpose of achieving definite outcomes

that improve a patient's quality of life.[30] When the Medication Modernization Act of

2003 was implemented the term for the non-dispensing services pharmacists provided

was changed from pharmaceutical care to medication therapy management (MTM). In

2004, 11 national pharmacy organizations defined MTM as:

> "… a broad range of professional activities and responsibilities
> within the licensed pharmacist's, or other qualified health care
> provider's, scope of practice. These services include but are not
> limited to the following, according to the individual needs of
> the patient:
> a. Performing or obtaining necessary assessments of the
>     patient's health status
> b. Formulating a medication treatment plan
> c. Selecting, initiating, modifying, or administering medication
>     therapy
> d. Monitoring and evaluating the patient's response to therapy,
>     including safety and effectiveness
> e. Performing a comprehensive medication review to identify,
>     resolve, and prevent medication-related problems,
>     including adverse drug events
> f. Documenting the care delivered and communicating essential
>     information to the patient's other primary care providers
> g. Providing verbal education and training designed to enhance
>     patient understanding and appropriate use of his/her
>     medications
> h. Providing information, support services, and resources
>     designed to enhance patient adherence with his/her
>     therapeutic regimens
> i. Coordinating and integrating medication therapy
>     management services within the broader health care
>     management services being provided to the patient."[31]

Through these services pharmacists have demonstrated the ability to improve therapeutic

and humanistic outcomes as well as patient safety.[29]

8

A benefit of relying on pharmacists as a NPC is the size of the workforce. The supply of pharmacists in the US is 77.02 per 100,000 US citizens, establishing them as the largest group of primary care oriented NPCs. In comparison, there are 76.60 primary care physicians per 100,000, 42.04 NPs per 100,000 and 16.82 PAs per 100,000. [32] In rural areas, pharmacists are the most available non-physician clinician, however, they tend to be absent in HPSA areas with small populations.[33] Pharmacists have demonstrated their abilities through programs and interventions that have improved the health of underserved populations.[34-40] Due to their large number they can be valuable assets in reducing disparities in care.

## 1.3 Current Health Care Environment

Attempts are being made to increase access to care for underserved populations. For example, the federal government is attempting to expand their coverage to a total of 30 million people by the year 2015 and 51 million by 2022.[41] Regardless of the number of facilities built, health professionals trained in the delivery of primary care will ultimately determine patients' access to care. The current trends in the US health system indicate that physicians may not be able to meet the additional primary care positions. Additionally, in 2006, community health centers (CHC) were reporting 6.8 %- 9.4% of their full time equivalent (FTE) CNPs and PAs positions vacant.[41] A large number of practitioners who desire to work with the underserved population will be needed in order to meet the demand over the next couple of decades. Currently, pharmacists are the largest group of NPCs available.

In the state of Ohio, there are 1,317,669 people living in HPSAs which is approximately 10% of the population.[8] Pharmacists may not be the solution for replacing physicians, however, they can supplement the care physicians and CNPs provide. Many patients require primary care in the areas of basic health screenings, routine care for chronic conditions, and education regarding their disease, lifestyle, medication, or adherence.[14] By using pharmacists to provide these services, physicians and CNPs can focus on patients that require services provided exclusively by them.

Recommendations to utilize pharmacist provided MTM services to care for underserved populations have been made in the past.[42] There is limited information available regarding the use of pharmacists in this role. Two studies of community health centers provide some insight on the common role of the pharmacist in these settings.  A nationwide survey of free clinics indicated that 36.4% did not provide pharmacy services.[43] Furthermore, clinics that did have pharmacy services primarily focused on dispensing services. Only 30% of all the clinics surveyed provided "advanced" pharmaceutical services which indicated medication history collection, MTM, immunization administration, health screenings, tobacco cessation counseling, patient assistance program enrollment, and needle exchange. Of the clinics that did not have pharmacist employees or volunteers, 81% reported dispensing medications.[43]

From 2001 to 2010 the number of CHCs and prescriptions filled per day doubled.[43] However, in that same time frame the percentage of licensed pharmacies at the CHCs and proportion of pharmacist volunteers and employees remained the same.[43] It is apparent that pharmaceutical interventions are not present in the majority of community

health clinics. From these examples, the role of the pharmacist does not seem as large as it could be to meet demand in both a dispensing or clinical capacity.

## 1.4  Need for Research

Many factors indicated that pharmacists can successfully fill the role of a NPC for underserved populations. In summary, pharmacists that provide MTM services in collaboration with health care teams have been shown to significantly improve patients' health outcomes.[29] They have shown the ability to successfully establish community health programs and generate improved outcomes for patients.[44,45] Assessment of pharmacists' desired work activities and actual work activities indicated that pharmacists would rather spend their time at work counseling and conducting drug use management with patients and less time dispensing.[46] Logistically, pharmacists are as numerous as primary physicians and have a geographic distribution that allows them to be accessible to most populations.

While the aforementioned facts indicate pharmacists' potential to greatly assist in the provision of care to underserved populations many gaps in the literature exist, which prevent a true understanding of pharmacists' current or potential role. The level of pharmacist involvement in the provision of non-dispensing services to underserved populations is unknown. Furthermore, results of successful pharmacists led health and MTM programs have mostly been published from groups of highly trained and motivated pharmacists. It is unknown if all pharmacists share the same willingness and confidence in their capabilities to provide non-dispensing services to underserved populations. Lastly, barriers that prevent the involvement of pharmacists in the provision of services to

underserved populations have not been identified. In order to grow and develop the clinical role of pharmacists in the care of underserved populations, the abilities, desires, and barriers pharmacists experience need to be defined.

## 1.5   Study Significance

This study will survey pharmacists in the State of Ohio regarding the non-dispensing services they provide to underserved populations. It will provide an overview of the role pharmacists currently fill in the provision of services to underserved populations as well as identify areas for potential growth.  Researchers will strive to evaluate pharmacists and the health care environment to identify areas that are prone to preventing their involvement in this cause.

## 1.6   Research Goal

The goal of this study is to describe the current pharmacist workforce in the State of Ohio regarding their current involvement with underserved populations and potential areas for growth so that health care decision makers can best utilize pharmacists in the delivery of care to underserved populations.

## 1.7   Research Objectives

1. To measure the proportion of pharmacists that frequently provide non-dispensing services to underserved populations in the State of Ohio

2. To identify which factors either environment or personal that pharmacists' feel most prevent the provision of non-dispensing services underserved populations

3. To identify environmental or personal factors that predict pharmacists' provision of non-dispensing services to underserved populations

4. To assess if pharmacists are willing to work with underserved patient populations with different characteristics, provide specific non-dispensing services, and provide disease state management for different diseases

5. To assess if pharmacists perceive themselves capable to work with underserved patient populations with different characteristics, provide specific non-dispensing services, and provide disease state management for different diseases

## 1.8   Research Questions

1. What is the proportion of pharmacists in the State of Ohio that are currently providing non-dispensing services to underserved populations?

2. Which patient populations, non-dispensing services, and disease states are pharmacists most frequently assisting or providing?

3. What populations, patient characteristics, non-dispensing services, and disease states are pharmacists most willing and capable to work with?

4. Are environmental barriers, personal factors, or a combination of both most responsible for preventing pharmacists from working with underserved populations?

# Chapter 2

# Literature Review

The intent of this chapter is to provide a thorough review of the literature pertaining to the important components of this study. The areas of interest include the results of pharmacists as primary care providers and the Social Cognitive Theory as it pertains to pharmacists' provision of non-dispensing services to underserved populations.

## 2.1 Pharmacists as Primary Care Providers

### 2.1.1 Medication Therapy Management as defined by Core Elements

The role of the pharmacist has expanded to providing a number of services beyond the role of dispensing and counseling patients on the use of an individual medication. Medication therapy management is an umbrella term for a variety of services that a pharmacist can offer. The American Pharmacists Association and the National Association of Chain Drug Stores Foundation along with the support of numerous pharmacy organizations described what they perceived as the core elements of MTM services that can be provided by pharmacists in a variety of community pharmacy settings.[47]

There are five core elements that have been identified: medication therapy review (MTR), personal medication record (PMR), medication-related action plan (MAP), intervention and/or referral, and documentation and follow-up.[47] MTR is the collection of patient-specific information regarding the patients' personal and medical information. The reviews can either be comprehensive, including all prescription and nonprescription medication and herbal and dietary supplements, or targeted at a specific area of the patient's current therapy. The ultimate goal is to identify actual or potential medical problems and develop a plan to resolve them. PMR is a comprehensive list of all the medications a patient is currently taking (prescription, nonprescription, herbal, and dietary supplements). The goal of PMR is to supply the patient with sufficient information to assist in his or her self-management of medications. It is also a useful tool to provide medication information to other health professionals at medical visits and institution admission and discharges.

The MAP is another service that is provided to assist patients with their medication self-management. The MAP outlines the pharmacist's recommended course of action for the patient to reach specific health goals. The plan only includes items within the pharmacist's scope of practice and should not include items that require the involvement of other health professionals. For items that do require the involvement of outside health practitioners to rectify medication-related issues that were identified during the patient encounter, pharmacists can act as a consultant to necessary health care providers to address the issue or refer the patient to the necessary health professional. The last element requires the documentation of the services and interventions rendered by the pharmacist to a patient at the end of an encounter. This will allow the pharmacist to

document patient progress and report the necessary information for billing. Additional benefits of documentation are tracking outcomes, enhancing the continuity of care for the patients, and facilitating communication between the pharmacist and the patient's other health care providers.

Another similar type of service to the MTM core elements is disease state management (DSM). The purpose of DSM programs is for pharmacists to focus on assisting patients with a specific disease state to prevent complications and increase in severity of the disease. This is achieved by using evidenced-based practice guidelines and patient education.[48] DSM was the name that originally preceded services that are now referred to as MTM per the core elements definition. It is not unusual to still see these terms used interchangeably in the literature.

Studies of pharmacist provided MTM programs and DSMs indicate that pharmacists have produced favorable results in variety of health care settings, disease areas, and different patient outcomes. A systematic review and meta-analysis conducted by Chrisholm-Burns 2010, analyzed the effects of US pharmacist-provided direct patient care in regards to therapeutic, safety, and humanistic outcomes.[29] There were 298 studies that were included in the study: 224 reporting therapeutic outcomes, 120 reporting humanistic outcomes, and 73, which reported safety outcomes. The most frequently provided service or intervention was educating patients on medication (n=160), educating patients on disease (n=106), educating patients in regards to medication or intervention adherence (n=101), prospective or retrospective utilization review (n=99), and chronic disease management (n=86). The disease states that were most frequently reported

(starting with the most occurring) were hypertension, dyslipidaemia, diabetes, anticoagulation, asthma/COPD, infection, and psychiatric conditions.

Studies were incorporated in the meta-analysis if they were randomized control trials at the patient level and reported the necessary statistical information.[29] Results regarding therapeutic outcomes found pharmacists' impact on hemoglobin A1c, low density lipoprotein (LDL) cholesterol, and blood pressure was significantly greater compared to standard health care practices. Additionally, favorable effects were demonstrated in International Normalized Ratio-/prothrombin time/activated partial thromboplastin time, body mass index, appropriate medication dose and monitoring, mortality hospitalization/readmission, inpatient length of stay and emergency department visits.[29]

In the area of safety outcomes, favorable results were reported in all areas which ranged from 60% (9 of 15 studies for adverse drug reactions) to 81.8% (9 of 11 studies for reported medication errors).[29] Only adverse drug events had sufficient data to run a meta-analysis. Pharmacist involvement in the reduction of adverse drug events had significantly better results compared to conventional health care practices.

Humanistic outcomes had favorable results that ranged from 12.9% (4 of 31 studies in quality of life) to 57.1% (20 of 35 in studies evaluating patient knowledge). The areas of humanistic outcomes that were studied using a meta-analysis were medication adherence, patient satisfaction, patient knowledge, QoL-general health, Qol-physical functioning, and QoL- mental health. Three areas proved to be significantly better than conventional services: medication adherence, patient knowledge, and quality of life (general health). The outcomes not found significant in this category could be

explained by the nature of the outcome, which is based on patients' perspectives and perceptions. These things can be subject to change regardless of an intervention or require more time to show improvement.[29] The overall results of the study indicated that in the general population, pharmacist-led programs have ability to improve therapeutic, safety, and humanistic outcomes.

The systematic review provided some indication of the amount of MTM research that focused on underserved populations. Of the 298 studies incorporated in the review, 19 studies (6.4%) focused on Medicaid patients, 17 studies (5.7%) were with uninsured patients and 8 studies (2.7%) with patients that paid out-of-pocket. Underserved patient groups did have smaller proportions of studies compared to patients with health care coverage; VA/DoD (13.8%), managed care/HMO (9.4%), and private (6.4%). The largest group of studies did not identify the source of reimbursement or categorize the patients by type of health care coverage, 164 (55%). Due to a large number of studies not reporting patients' type of health care coverage it is hard to discern the amount of programs or research interest there is in providing serves to underserved populations.

## 2.1.2 Additional Medication Therapy Management Services

Additional broad-spectrum health services that pharmacists can provide are immunizations, health screenings, and health and wellness programs. Recently, pharmacists have become an important component in the delivery of immunizations. Immunization has been growing in pharmacies over the last ten years. Pharmacies either have pharmacists administer the vaccinations to the patients or outsource the service to other health care professionals to provide on location. Outsourced immunizations have

grown from 22.6% to 44.8% and in-house from 3.1% to13.7% between 1998 and 2004.[49]

Due to variations in laws that regulate pharmacists' immunization programs, the extent to

which immunization services are offered in pharmacies depend on the state. Across 17

states, 44.8% of pharmacies that outsource services currently have immunization services

and planned to continue their program. Additionally, 5.8% of pharmacies plan to

implement a program within the next year and 7.9% are considering starting a program.

In-house programs were not as popular; 13.7% currently provided services and 29.4%

indicated an interest in starting an in-house program.[49]

Pharmacist administered programs have shown to increase immunizations for

many different groups of patients.[50] An example from the literature is a study that

evaluated influenza vaccination rates of cardiovascular patients seeking treatment at a

secondary prevention lipid clinic. The flu season before implementation of the influenza

vaccination program, 39% of patients received a vaccination and patients over the age of

65 received significantly more vaccinations compared to younger age groups.[51] After the

pharmacist vaccination clinic was implemented, the percentage of clinic patients who

received a vaccination significantly improved to 79% and the disparity in age of patients

receiving vaccinations was eliminated.

Pharmacists provide a variety of screening and health and wellness programs.

Examples of diseases that pharmacists conducted screenings are osteoporosis,

cardiovascular, diabetes, depression, and infectious diseases to name a few.[37,52-54] Health

and wellness programs also have a large variety. Pharmacists in the past have provided

counseling and patient education in the MTM programs for chronic diseases and methods

for improving adherence to the medication patients are prescribed.[29] Lifestyle counseling

is also offered in the areas of nutrition and smoking cessation for example to improve the patients' health status or to assist with meeting the therapeutic goals when treating their chronic illness.[55,56]

### 2.1.3 Outcomes Resulting from Pharmacist Provided Services to Underserved Populations

Specifically in underserved populations pharmacists have shown the ability to provide a spectrum of needed health services with favorable results. Pharmacists have demonstrated the capability of independently starting health programs and pharmacies to assist underserved populations. A collaborative relationship between a federally funded CHC in Missoula, Montana, the University of Montana School of Pharmacy, and Allied Health Sciences (SPAHS) lead to the establishment of an on-site pharmacy at the Missoula CHC. From November 1, 1999 to April 30, 2000 this relationship was able to decrease expenditure per prescription from $16.55/month to $0.51/month.[44] Pharmacists in this clinic also established programs in diabetes, hypertension, dyslipidaemia, asthma, anticoagulation, and peptic ulcer disease as well as a refill clinic to provide a systematic approach to target long-term monitoring of patients with chronic diseases.

Another example found in the literature was at Su Clinical Familiar (SCF), a CHC in Lower Rio Grande Valley in southern Texas.[40] Pharmacists identified a need for psychiatric services and a pharmacist who had completed a one-year residency in psychiatry approached the CHC director to start the program. Over the 15-month program 96 of 125 patients referred to the clinic by their primary care provider visited the clinic. Of the 74 patients asked by the pharmacist to schedule a follow-up appointment 53 returned. Over 90% of the pharmacist's clinical recommendations to the primary care

provider were accepted. As a result of the clinic, patients were able to receive counseling regarding their medication and be assessed for possible complications. Clinical and humanistic outcomes were not assessed for the program, however, it was estimated the pharmacist clinic generated a total direct cost savings of $22,380 over the 15-month period.

Pharmacists have shown to be effective at assisting in the management of chronic diseases in underserved populations. The literature provides two examples in the area of diabetes. The first study evaluated pharmacist services provided to indigent diabetic patients attending a free medical clinic.[57] Data was analyzed retrospectively through medical chart review. Patients that were referred to the diabetes specialty clinic (n=47) were compared to patients that only received health care services from the physician (n=45). Patients in the experimental group showed more improvement than those in the control group over the course of the study. Both groups of patients had access to the same medication assistance programs, diabetes educators, medication formulary, pharmacy, referral to specialty care, and laboratory facilities.

Patients that were enrolled in the pharmacist-led specialty diabetes clinic had better outcomes after 1.8 years than the control groups which only received services from the physician.[57] The experimental group achieved significantly larger decreases in blood pressure and LDL levels. Experimental group patients also experienced a significant increase in statin utilization. Hemoglobin A1c did decrease more in the experimental group (2.0%) compared to control group (1.2%), however, the difference was not statistically different.

The second diabetes program occurred at the Venice Family Clinic.[34] Patient groups were determined retrospectively using data collected in 1997-1998. Patients who had been referred to a pharmacist led diabetes program (n=89) were compared to a group of randomly selected clinic patients (n=91) that only received care using the standard clinical services. Hemoglobin A1c was the primary measure for the study. Experimental group patients had a significantly greater decrease in A1c values (-0.8 ± 0.2) compared to the control group (-0.05 ± 0.3).

The effects of pharmacist-led programs extends beyond diabetes and cardiovascular diseases. A statewide HIV MTM program for Medi-Cal (California Medicaid) beneficiaries at designated pharmacies had beneficial outcomes.[35] Patients who attended the community pharmacy HIV MTM programs experienced a statistically higher adherence rate and a statistically greater number of patients that were able to maintain the same ART regimen. Additionally, these patients had a statistically lower number of contraindicated regimens and number of excess medication fills indicating that overall the MTM patients received a higher quality of treatment.[35]

When serving populations with different cultures and potential language barriers, pharmacists have shown to be effective at generating positive outcomes for the patients. A pharmacist-led DSM program at El Rio, a FQHC in Tucson, AZ, was started to provide services to an underserved predominantly Hispanic/ Latino populations who spoke predominately Spanish as their first language. Pharmacists focused on diabetes and common comorbidities to reduce chronic kidney disease risk.[58] From baseline to follow up, patients on average experience a 2% decrease in A1c values, significant improvement

in other clinical values such as blood pressure, lipid panels, and blood glucose, and had better guideline compliance in regards to taking aspirin and ACE-inhibitors.

In addition to MTM programs pharmacists have been able to successfully provide broader health services. For example, in rural settings, pharmacists have shown to be important in the provision of needed health services. In Nebraska, pharmacists greatly contributed to the advocacy and enrollment of the program "Every Woman Matters". Pharmacists generated 114 patient referrals from 28 pharmacies for a health program that provides mammography and pap smears at little to no cost for eligible women. Community pharmacies in this study were an effective method of recruiting women into public health programs.[52]

## 2.1.4 Pharmacy Workforce Provision of MTM

The 2009 National Pharmacist Workforce Survey was conducted with the specific objectives to describe the demographic and work characteristics of the pharmacist workforce in the US and describe the work contributions of the pharmacist workforce during the year 2009. The survey was distributed to a random sample of 3,000 pharmacists across the US, of which 1,395 responded.[59] When asked to report their time conducting various work activities, on average pharmacists indicated they spent 55% of their time dispensing medication, 16% providing patient care services, 14% involved with business/organization management activities, 5% to education, 4% conducting research, and 5% to other activities. The percentage of time doing different work activities differed by work setting. Community pharmacy settings (defined as independent, chain, mass merchandiser, or supermarket pharmacies) spent a larger

amount of time dispensing (70%) and less time providing patient care (10%). Those pharmacists who worked in hospitals or other patient care settings devote more time to patient care services (27%) and less time dispensing (43%).

Studies were found in the literature that provided an estimate of the proportion of pharmacists that might be involved in providing MTM services. A survey of community pharmacists that were members of the Texas pharmacy association was conducted to assess awareness of MTM legislation, confidence providing MTM, intentions to provide MTM, and barriers to MTM provision.[60] The survey was e-mailed to 1,833 pharmacists of whom 157 responded for a response rate of 11.8% (157 of 1338). Approximately, 50% were providing MTM services (core elements) at the time of the survey. Pharmacists reported most confidence providing MTR, creating PMRs, and performing interventions/ referrals. Additionally, the majority of the participants indicated an interest in providing MTM (74%) and receiving additional training in MTM (78%).

Members of the National Community Pharmacists Association (NCPA) were also surveyed regarding this topic in January 2007.[61] The survey was available electronically for participants to complete. The link to the survey was distributed to NCPA members through a weekly newsletter that contained a brief description of the study as well as information concerning the location of the survey. The survey had 143 respondents from the estimated 10,000 active and inactive members that received the newsletter.

Of those who responded, 65% indicated that they were aware of and currently practicing MTM; 64% of those participants were practicing (41.6% of total survey respondents) prior to Medicare Part D. Respondents felt that they were adequately prepared to provide MTM services in reference to their clinical knowledge and

experience. Additionally, most participants believed that their pharmacy was adequately prepared to provide MTM services (77.1%) and that pharmacists had the necessary information available them to design MTM services (84.8%).

A large group of outpatient pharmacists were assessed regarding the pharmacists' involvement with MTM. Pharmacists' contact information was obtained through members of the American Association of Colleges of Pharmacy's Pharmacy Practice roster, the American College of Clinical Pharmacy Ambulatory Care Practice and Research Network, the American Pharmacists Association Community and Ambulatory Practice and Clinical/Pharmacotherapeutic Practice Academy Sections, the American Society of Consultant Pharmacists Senior Care Pharmacist Forum Internet mailing list, and the American Society of Health-System Pharmacists.[62] The survey was sent electronically during the March 2007 to 14,419 pharmacists to whom 1,019 responded for a response rate of 6.7%.

The objective of the survey was to assess perceived and actual barriers to implementing MTM services encountered by pharmacists in the outpatient setting and to assess demographic and other factors associated with the identified barriers. The study found that 80.0% of the respondents were providing MTM or some form of direct patient care services; 35% compensated and 45% uncompensated.[62] The study categorized pharmacists into three groups based on their status in regards to providing MTM. The three groups were interested in providing MTM, provide MTM without compensation, and provide MTM with compensation. The most common barriers faced by pharmacists in the groups that were already providing MTM were related to compensation. The

largest barriers faced by those pharmacists that were interested in starting an MTM program were lack of additional staff and poor access to medical information.

A study conducted in West Virginia of pharmacists-in-charge of licensed pharmacies reported a lower number of pharmacists involved with the provision of MTM services than compared to the studies mentioned previously.[63] There were 203 responses to 503 deliverable surveys for a response rate of 40.4%. This study also analyzed respondents for response bias, which showed no difference between individuals that responded in the first 8 days and those that responded after 30 days. Of the respondents, 27.1% reported that they provided MTM services.

One last piece of literature was published in March of 2010 by the American Pharmacist Association titled "Medication Therapy Management Digest". This document was the result of a national environmental survey of providers and payers for MTM service.[64] The survey was distributed to pharmacists that were most likely to have direct involvement with MTM services and payers who were presumed to be involved in their organization's reimbursement for MTM services.

There were 10,751 providers and 4,194 individuals with payers that were surveyed electronically to yield responses from 742 providers (26% of those who viewed email) and 70 payers (17% of those who viewed the emails). The results of this assessment were similar to the findings of the third study concerning barriers to pharmacists involved with MTM service provision. Of those individuals that responded, 72% provided MTM services and 24% of those individuals who didn't provide MTM services provided some other form of patient care (immunizations, health screenings, etc.).

The studies ranged from 27.1% of respondents to 80% that reported providing some form of MTM service. The first 3 studies mentioned are suspect for non-response bias due to low response rates and no attempts on the authors' part to assess their data for it. The "MTM Digest" also found a large number of pharmacists that were involved in providing MTM services which might legitimize the response of these other studies. It appears reasonable to assume that currently a large proportion of pharmacies are involved with the provision of MTM. These studies, however, did not provide much indication of the demographics of patients they were serving. One study indicated that the percentage of pharmacists reporting no compensation for MTM programs was 45%, which could indicate programs for the underserved.[62] Additionally, the MTM digest indicated that 28% of third party payer organizations offered MTM to patients on State Medicaid programs. Based on present information, it is hard to discern the extent pharmacists are providing non-dispensing services to underserved populations.

## 2.1.5 Pharmacists' Provision of Services to Underserved Populations

When trying to assess the pharmacy workforce as a whole for their provision of services to underserved populations only two studies offered vague indications of pharmacists' involvement with underserved populations. A survey was conducted by Wiesner 2010 of free medical clinics in the United States in early 2008. A 26- item questionnaire was sent electronically to all clinics registered at www.freeclinicfoundation.org.[43] The intent of the study was to assess clinic and pharmacy demographics, pharmacy services, medication storage and distribution processes, and systems management.

Of the 518 clinics that received the survey, 216 responded (42%). Of those clinics, 36.4% offered no pharmacy services and 61.1% offered traditional services.[43] Within the clinics that offered traditional services, 30.3% had advanced pharmacy services (MTM or other pharmacist provided patient care). A third of the sites that offered pharmacy services were most likely teaching sites and a correlation was noted between licensed pharmacy status and teaching sites for pharmacy students. Only 29.9% reported having a licensed pharmacy. Of those clinics without a licensed pharmacy, 31.3% still utilized pharmacy personnel to dispense medications. Data also showed that the lack of pharmacy staff at facilities did not prevent the dispensing of medication. More than 81% of clinics without pharmacy personnel frequently dispensed medication.

It might be assumed that with the advancements in non-dispensing services provided by pharmacists and the increase in clinically trained pharmacists in the workforce[59] would lead to an increase in the presence of pharmacists in free medical clinics. The survey of clinics indicates small growth over the last eight years. The number of free medical clinics has increased as well as the number of prescriptions filled per day since 2001. Meanwhile, the number of clinics with a licensed pharmacy and the mean number of pharmacist volunteers/ employees has remained constant. Additionally, the fact that 81% of clinics that do not have pharmacists on staff dispense medications indicates a possible need for pharmacists that is not being filled. This information may indicate a shortage in pharmacists working with underserved populations. The barriers to pharmacists practicing in the CHC setting are unknown. The barriers could be at the individual level of the pharmacist not wanting to practice in this setting for a number of

reasons or barriers might arise from something health system related such as decision makers not understanding the additional services pharmacists can provide.

The second study attempted to assess the frequency pharmacy services were provided in CHCs and migrant health centers (MHCs), the importance of these services in these settings, pharmacists' preparedness to provide these services, and determine whether pharmacist- and site-specific characteristics are related to the provision of pharmacy services.[65] The survey was distributed to 1,260 pharmacists identified as the contact person at the health centers the summer of 2000. There were 558 respondents from 1,191 delivered surveys (46.9% response rate).

The first portion of the survey was designed to report the frequency of, pharmacists' perceived importance of, and pharmacists' level of preparedness to provide specific MTM services.[65] Services were separated into 2 areas: traditional services and pharmaceutical care (comprised of collecting, organization, and evaluating information, formulating a course of action, providing medications and counseling patients, and monitoring and managing patient outcomes). Traditional services were provided more frequently than pharmaceutical care services and pharmacists indicated they felt these services were very important and they were very prepared to provide them.

Pharmaceutical care services responses varied greatly. The services were not provided as frequently as traditional services.[65] Collecting, organizing, and evaluating information was the category that showed the highest frequency of services provided. Pharmacists predominantly focused on the medications patients were taking and did not assess the patients' medical condition. Formulating a course of action and monitoring and managing patient outcomes received the lowest frequency of provision, importance, and

preparedness. The scores predominantly ranged from 1.7 to 3.1 for frequency of provision indicating that pharmacists only provided these services sometimes to half of the time.

There was a large difference noticed in the frequency of services provided and preparedness of pharmacists between those who had received additional education and those that did not. Pharmacists with additional training provided a statistically higher frequency of pharmaceutical care services and rated themselves statistically higher in regards to their perceptions of preparedness. Both groups of pharmacists agreed that the services pharmacists could provide were important.

This study was conducted at a point in time where MTM was still gaining momentum in the health care arena. This study does indicate that pharmacists at the time agreed on the importance of pharmaceutical services in that CHC environment. It is possible that the role of pharmacists in the CHC environment has grown since. It would be another three years until the Medication Modernization Act was passed identifying pharmacists as eligible providers of MTM, five years before large numbers of pharmacy students starting graduating with a doctorate of pharmacy degree, and six years before the implementation of Medicare Part D and reimbursement for MTM services delivered to that population. These changes in the environment may have prompted greater pharmacist involvement.

The current role of the pharmacist workforce in the provision of care to underserved populations is relatively undefined. From the literature, the percentage of the pharmacy workforce that provides care to underserved populations cannot be determined. Comfort and confidence have been identified as important predictors of willingness to

provide MTM services, however, pharmacists have not been assessed recently for their

comfort and confidence providing care to underserved populations. Additionally,

pharmacists have identified many barriers to the provision of MTM services. Most of

those barriers have been evaluated in the context of interaction with payers. It is unknown

the types of barriers pharmacists experience when trying to provide care to underserved

populations.


## 2.2   Social Cognitive Theory and Pharmacist Behavior Providing Non-dispensing Services

The Social Cognitive Theory proposes that an individual's behavior is a product

of both sociostructural (environmental) factors and psychological mechanisms of an

individual's functioning (personal factors).[66] Behavior, environmental factors, and

personal factors interact through a process called triadic reciprocal determinism. This

concept states that each of the three factors influences the other two factors either

negatively or positively. Therefore, personal factors and/or environmental factors can

interact separately or together to increase or decrease the pharmacists' behavior in

regards to providing non-dispensing services.
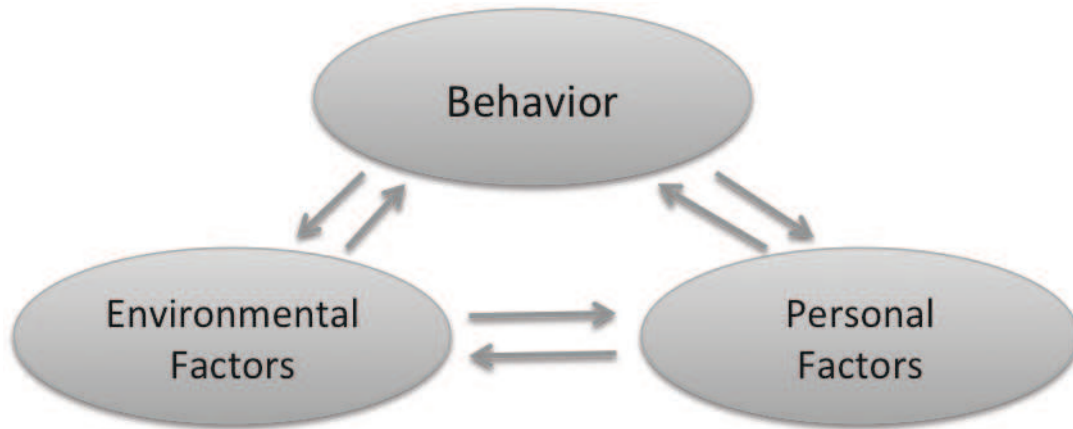
**Figure 2.1: Social Cognitive Theory**

## 2.2.1 Personal Factors

Bandura identifies human agency as the underlying determinant of personal factors in his model. Human agency refers to the capability for human beings to make choices and to impose those choices on the world.[66] Human agency is comprised of four core features: intentionality, forethought, self-reactiveness, and self-reflectiveness.[66] In order for an individual to be prompted to change their behavior or environmental factors they must first have an intention. An intention is a representation of a future course of action to be performed.[66] It is not simply an expectation or prediction of future actions but a proactive commitment to bringing them about. Additionally, through the exercise of forethought people motivate themselves and guide their actions in anticipation of future events.[66] Behavior is motivated and directed by projected goals and anticipated outcomes.

Self-reactiveness generates motivation and action through personal appraisal of performance in regards to personal goals and standards.[66] Goals, which align with an individual's value system and personal identity, give those activities meaning and purpose. People give direction to their pursuits when making the self-evaluation

conditional on matching personal standards and create self-incentives to sustain their efforts for goal attainment. As a result, people engage in activities that give them self-satisfaction, pride, and self-worth, while avoiding things that create self-dissatisfaction and devaluation.[66]

People do not only generate action and change but also examine their decisions and efforts. Through reflection of self, people evaluate their motivation, values, and meaning of their pursuits.[66] Individuals use this reflection to navigate conflicts and decisions in regards to motivating interests and choose one over another. Self-reflectiveness is therefore an essential activity that determines behavior.[66] It is strongly linked to the concept of self-efficacy[1]. Individuals' self-beliefs concerning their ability to complete the necessary goal or task play a central role in the self-regulation of motivation through goals and outcome expectations. The likelihood that people will act on the outcomes they expect from future actions depends on their beliefs about whether or not they can produce the necessary actions.[66]

### 2.2.1.1 Willingness

The term "willingness" has been used to encapsulate health care practitioners' desires to assist underserved populations in previous surveys. Links have been shown in studies that connect willingness to the core features of intentionality, forethought, and self-reactiveness. A study by Chirayath 2006 examined the influence of sociodemographic characteristics, family lives, educational experiences and work

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[1] Self-efficacy- the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations. **67.** Bandura A. Self-Efficacy in Changing Societies: Cambridge University Press.; 1995.

environments over the course of a physician's life to shape their attitudes and behaviors toward serving the medically indigent.[68] Results indicated that professional characteristics had the most direct effect on indigent caseload of physicians. Physicians' attitudes were identified as having the largest indirect effect on indigent caseload. Attitudes were identified as the underlying determining factor of how physicians with certain professional characteristics would serve indigent populations in their practice.[68] When multivariate analysis controlled for professional characteristics and other model components the sole component outside of professional characteristics was physician attitude that predicted higher indigent caseload. Physicians that were more religious, more liberal, encouraged to service indigent populations by a service-oriented mentor, and entered the profession with the desire to help others were shown to have more positive attitudes towards working with indigent populations.[68]

Additionally, a study used the Schwartz values questionnaire to assess the values types of physicians in regards to aspects of their practice.[69] The questionnaire assesses 56 personal values to define the participant's values in the area of 10 value types. The value types are organized into 4 dimensions of self-transcendent, self-enhancement, conservative, and openness to change. Each questionnaire item is designed to have self-transcendence and self-enhancement or conservative and openness to change dimensions opposing at each end of the rating scale. Physicians from the American Academy of Family Physicians were surveyed regarding practice satisfaction and service to the underserved. An association was found between traditional value type, which means humble, accepting my portion in life, devout, respect for tradition, and moderate, and physicians with more than 40% Medicare, Medicaid, and/or indigent patients.[69] For

physicians with a practice that consists of 30% or more indigent patients there was a significant association with the value of universalism, which is the motivation to enhance and protect all people.

There is currently a gap in the literature regarding pharmacists' willingness to assist underserved populations. Literature pertaining to physicians' willingness to serve underserved populations was used to determine if willingness was an accurate measurement for human agency. The two studies of physicians do indicate that willingness relates to intention, forethought, and self-reactiveness. Self-reactiveness seems to have the largest influence with physicians who have moral standards related to giving back to the community being predictive of higher involvement in the provision of care to the underserved.[68,69] Intention and forethought also showed to have a role with some physicians choosing their profession with the intent to assist those in need.[68] It is unknown if pharmacists chose their profession for the same reasons.

Literature does indicate that pharmacists are interested in the provision of MTM services. The MTM digest lists responsibility as a health care provider, patient health needs, recognized a need to improve health care quality, and contribution to the health care team as very important factors affecting the decision to offer services among providers.[64] The survey of Texas pharmacists indicated a high level of pharmacists' intent to provide MTM services and purse additional training.[60] The survey of NCPA pharmacists reported that 78.4% of pharmacists believed pharmacists are willing and should be involved with the provision of MTM services.[61] Additionally, the National Pharmacy Workforce Survey indicated that pharmacists in all work settings desired to spend more time providing patient care activities than they currently do.[59] The literature

seems to indicate that pharmacists as a profession are interested and motivated to provided MTM services, however, pharmacists' desires as a profession to assist the underserved population has yet to be studied.

Studies of health practitioners' attitudes towards working with underserved populations do seem to be similar. While there were not any studies that assessed predictors of pharmacists' willingness to serve underserved populations, general assessments of their attitudes were found. Two studies were found that indicated pharmacy students' willingness to assist underserved populations. The first used a survey titled the Medical Students' Attitudes Toward the Underserved (MSATU).[70] The MSATU is designed to assess the attitudes of medical students in regards to providing medical care to underserved patients. The survey assesses respondents with 2 subscales, attitudes and services. Attitude subscale has 2 factors, which are societal expectations and professional responsibility. The services subscale has 2 factors, which are basic services and expensive procedures. At the time of the survey it was the only assessment in this area that has been shown to be reliable.

The MSATU was used to compare pharmacy and medical students in years 1, 2, and 4. The survey was adjusted slightly to compensate for the pharmacy students by switching the terms medical and physicians to pharmacy and pharmacists. The MSATU score is a combined score of the attitudes and services subscales, which is presented as a standardized T-score. Pharmacy student's attitude remained constant over the course of the 4 years (year 1= 45.2, year 2= 48.3, year 4= 45.7) while medical students' attitudes decreased steadily (year 1= 55.5, year 2= 53.4, year 4= 46.4).[70]

A result that was not highlighted in the study was that pharmacy students had lower attitudes as a whole and specifically in the area of professional responsibility when compared to the medical students. The medical students, while their scores did decrease, still had higher scores at the end of four years. The pharmacy students indicated they had lower attitudes at initiation and maintained that lower attitude over the course of the study. The scores were reported as T-scores, which indicated that the pharmacy students were below the mean the entire time through college. It is unknown if this trend continues into the pharmacy students careers.

Pharmacy students in their third and fourth years at University of Minnesota, North Dakota State University, and South Dakota State University were surveyed regarding their interest in rural pharmacy practice, rural pharmacy ownership, and a proposed rural pharmacy practice model.[71] There were 177 respondents for a responses rate of 39.8%. Of those who responded, 62.7% of respondents indicated seriously considering practicing in communities of 5,000 people or less. Additionally, 61% of all respondents indicated interest in working in a pharmacy that utilized a nontraditional pharmacy service delivery model. Only 35.6% of the students were originally from a community of 5,000 or less indicating at least half of those interested in practicing in the rural areas were from areas of higher population densities. Pharmacy students might be more flexible in practicing in areas that lack primary care services.

Studies of other health care professionals were analyzed for factors that influence their willingness to service underserved populations. The first study was an assessment of California physicians' willingness to care for the poor. Focus groups of 24 physicians from 4 California communities were assembled in order to develop a survey.[72] The

resulting survey was then distributed to a random sample of 177 California general internists, family physicians, and general practitioners.

The survey had a response rate of 70%. When physicians reported if they were taking new patients, 77% were accepting patients with insurance, 31% were accepting Medicaid, and 43% were accepting new uninsured patients.[72] Financial factors seemed to be the biggest issues to providing care to underserved patients with 88% stating that as a reason for not accepting Medicaid patients and 77% for uninsured. Nonfinancial reasons were also identified as reason for not accepting underserved patients. Psychosocial problems, perceptions that the patients were ungrateful, and noncompliance were nonfinancial issues that were important factors. Physicians also identified a fear of being sued as a major reason for not accepting new patients: 57% for Medicaid and 49% uninsured. They felt they were more vulnerable to malpractice with these populations because there was more uncertainty in the diagnosis of the patients' health conditions due to lack of test and poor medical history.

It was interesting that physicians had different perceptions and willingness to serve depending on the underserved population. Physicians reported financial reasons were a primary factor in determining whether or not they accepted underserved populations. Physicians were more likely to accept uninsured than Medicaid patients, however. Medicaid patients have an insurance provider and uninsured patients would most likely be uncompensated care, which seems contradictory to their original selection criteria. This phenomenon may indicate different levels of comfort or established bias within the physician community directed toward different types of underserved populations.

When surveying dental students of their levels of comfort providing care to underserved populations, the surveyors also decided to ask the level of comfort for each segment of the underserved population. Dental students were asked to indicate their willingness to serve each population using a 5-point itemized rating scale.[73] Scores were slightly skewed favorably, however, median scores ranged from 3 to 5. This survey was conducted before the students had started their rotations providing serves to vulnerable patients. These results may indicate practitioners have inherent bias toward different underserved populations. The best practice for assessing health care practitioners' level of comfort for underserved population might be to ask the respondent to rate each population independently of the other due to the different aspects of each population.

### 2.2.1.2 Capabilities

"Among the mechanisms of personal agency, none is more central or pervasive than people's beliefs about their capabilities to exercise control over events that affect their lives."[74] Pharmacists' perceptions of their abilities have been a large factor in determining their involvement in the provision of MTM services. A study by Blake 2010 was conducted to identify barriers to the provision of MTM services perceived by pharmacists and factors associated with employment in a pharmacy that provides MTM services. The survey was distributed to 906 community pharmacists with licenses in West Virginia. Analysis indicated that comfort level and ability are important factors in determining if a pharmacist seeks employment in a pharmacy that provides MTM services.[75] In the survey of NCPA pharmacists, the authors also reported that lack of

knowledge and willingness was mentioned as a challenge to providing MTM services by 20% of the respondents.

## 2.2.2 Environmental Factors

Social structures represent authorized systems of rules, social practices, and sanctions designed to regulate human affairs.[66] Based on Bandura's model, pharmacists' involvement or lack of involvement may not be a personal choice but regulated by environmental factors. The environmental factor that seems to have the largest impact on the provision of MTM is billing. The MTM digest listed billing as difficult for both providers who are currently providing MTM and those who are not. This was also supported in the Lounsbery 2009 study that focused on evaluating barriers to MTM service implementation. This author reported that the most common barrier between compensated and uncompensated MTM services was documentation and billing related issues.[62] The MTM digest reported other factors that were identified as significant to providers not currently offering MTM services, which were inadequate time, staffing levels insufficient, dispensing activities are too heavy, documentation for services is difficult, and payment for MTM services is too low. Other studies reported struggling with staffing issues and pharmacist availability to provide services. Lounsbery 2009 reported issues with staffing as well as the NCPA survey.[61,62] The survey of pharmacist-in-charge as well as the NCPA survey indicated pharmacists lacking sufficient time to provide services.[61,63]

A few other issues that appeared in the literature but showed to be neither significant nor insignificant when compared to all of the issues in the MTM digest was

expressed physician resistance and inadequate training/experience. A study by Law in 2009, indicated that patient and physician attitudes were an issue that they perceived as a challenge in developing and instituting MTM service programs.[61] Approximately 45% of respondents indicated lack of physician support as a problem. Additionally, the Lounsbery study indicated pharmacists regardless of compensation felt access to primary care physicians was a barrier in either operating their MTM services or interested in starting MTM services.[62] Studies in the literature have indicated that physicians appreciate pharmacists' contributions to the health care team in the form patient education regarding the medication and identifying potential medication complication and generic substitutions.[76-78] They do not appreciate pharmacists making independent drug recommendations and physicians feel they are better suited for disease education.[76-78] Reports of this nature indicate that more barriers could be present in the general health care system stemming from preconceived roles of different health professionals.

These studies predominantly focused on MTM services in the pharmacists' place of work. When examining a situation where MTM services are delivered in a volunteer setting, the interests and barriers experienced by pharmacists are relatively unknown. Little information is available that documents pharmacists' interests in providing uncompensated care. When services are not provided in the work place, pharmacists have more control over the use of leisure time. Barriers might be encountered that extend beyond comfort and confidence to included travel, desires to spend leisure time doing different activities outside of pharmacy, and motivation to practice pharmacy outside of work.

Information of volunteerism for physicians is similarly lacking. A few studies were found that offer rudimentary information on physicians' involvement in the community and their perceptions of volunteering. The physician profession seems to highly value community service. One survey reported that 94% of respondents indicated community involvement in regards to providing health related expertise to local community organizations as important.[79] The fact that only 54% of the physicians were able to volunteer in that capacity over the three years before the survey may indicate that barriers exist that prevent physicians. A recent study showed that when compared to the general public, physicians were 50% less likely to volunteer.[80] Common barriers were related to their schedules and amount of free time.[80]

Studies of the types of activities physicians volunteered showed that physicians tended to be most involved in health related community services. Those positions included being a part of a local, state, or national health organization in a variety of roles from general membership to being on the board of directors.[81] Physicians also identified being involved in community health related groups that presented health talks to groups, addressed a local health problem, or participated in health fairs.[81] Pharmacists may be exposed to similar barriers. Additionally, pharmacists may experience additional barriers for the fact that their role in non-dispensing services is relatively new and community organizations are not aware of how to utilize them for their cause.

## 2.3 Summary

Pharmacists have shown the ability to establish and provide quality non-dispensing services that lead to an improvement in health status for underserved populations. Currently, it is unknown how involved the Ohio pharmacist workforce is in providing non-dispensing services to underserved populations. While limited, information available indicates that there is a greater demand for pharmacist non-dispensing services for the underserved than what pharmacists are supplying. It is unknown if 1.) pharmacists are as involved as they could be with underserved populations and 2.) reasons which are most responsible for determining pharmacists' involvement with underserved populations.

The Social Cognitive Theory states that personal behavior, personal factors, and environmental factors interact with each other through a process of reciprocal determinism. Personal behavior, personal factors, and environmental factors influence and are influenced by the each other to produce a final way in which the individual decides to interact with the world. Health practitioners' willingness and perceived capabilities to interact with the underserved populations from the literature has been shown to adequately measure personal factors \(human agency) as described by the Social Cognitive Theory. Many factors in the environment such as staffing, billing, and interaction with other members of the health care team have shown to be important environmental factors in determining the provision of MTM. Based on the literature the following model can be constructed to represent the application of the concepts for this study (Fig. 2). Gaps still remain regarding pharmacist's willingness and capabilities to

provide non-dispensing services to underserved populations and environmental factors

that may prevent or increase that behavior.
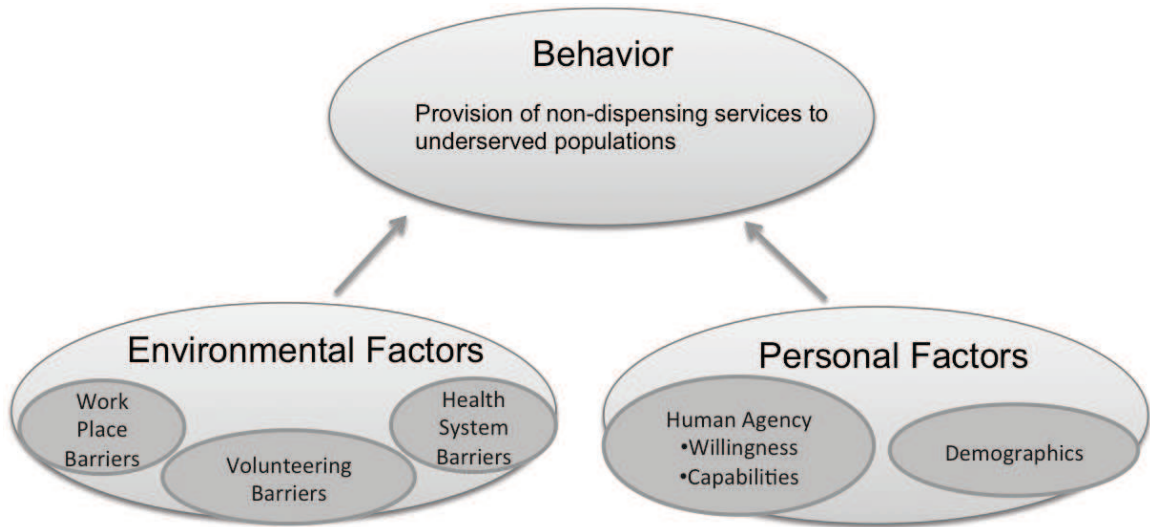


**Figure 2.2: Social Cognitive Theory Adaption**

# Chapter 3

# Methodology

This chapter explains the methodology used to achieve the research goals of the study. The study will conduct a survey to assess pharmacists' willingness and capabilities to address the health needs of the underserved as well as identify potential barriers that prevent the provision of non-dispensing services. A survey was chosen due to the large geographic area of the sample size being measured. While a focus group would be useful in identifying possible answers to the research questions generated by this study, it would be difficult to construct focus groups that would be generalizable to the State of Ohio. Additionally, established datasets do not exist that would suffice to address the study objectives. An electronic survey was identified as the most efficient and effective method by which to collect the information from the desired population of pharmacists in the State of Ohio. The methodology chapter will discuss the theory frame work of the study, study design, instrumentation, data collection, and data analysis.

## 3.1 Theoretical Frame Work

The survey was designed based on constructs of the Social Cognitive Theory. It is the intent of this research to better understand pharmacists' current behavior of providing non-dispensing services to underserved populations and identify factors that may increase or decrease this behavior. Items in the survey have been written to describe each of the three components of the SCT: Behavior, Personal Factors, and Environmental Factors.

Bandura's model focuses on the concept of triadic reciprocal determinism. This concept states that behavior is modified by the interaction of personal and environmental factors. In turn, the resulting behavior will modify an individual's personal and environmental factors in support of the new behavior. The concept of triadic reciprocal determinism was not included in the adaption of this model to meet the research goals of this study. Instead a linear approach will be used to examine the effects of personal and environmental factors either individually or together on pharmacists' behavior.
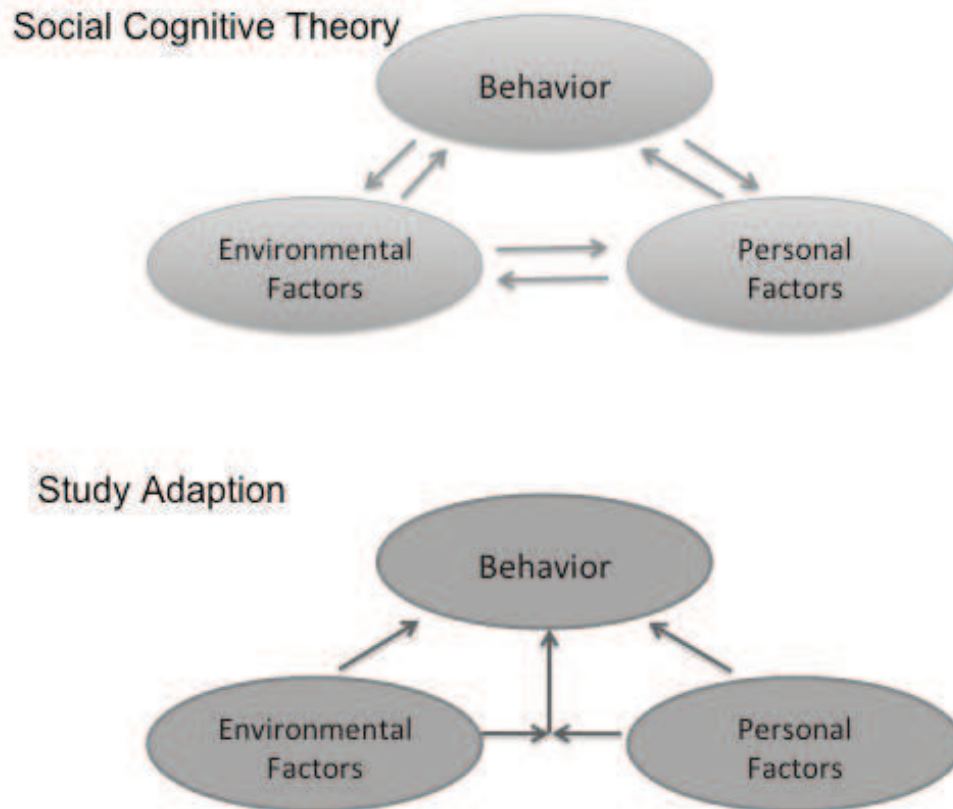
**Figure 3.1: Study Adaption of Social Cognitive Theory**

The model components of behavior, personal factors, and environmental factors and the relationships between them were measured in different ways to achieve the objects of the study. The first objective of the study focuses on the behavior aspect of the model. Pharmacists are asked whether or not they are currently providing non-dispensing services. For those pharmacists who are providing non-dispensing services, more specific information was gathered regarding location they provide the services, characteristics of the population they assist, the services they provide, and the diseases states they treat. The culmination of these survey items assisted in addressing objective 1 "To measure the proportion of pharmacists that frequently provide non-dispensing services to underserved

populations in the State of Ohio", and defining pharmacists' behavior in regards to assisting underserved populations.

The objectives "to identify which factors either environment or personal that pharmacists' feel most prevent the provision of non-dispensing services underserved populations" (objective 2) and "to identify environmental or personal factors that predict pharmacists' provision of non-dispensing services to underserved populations" (objective 3) focused on environmental and personal factors and their influence on behavior. Social structures as defined earlier were identified as the most likely environmental factors to influence pharmacists' provision of non-dispensing services. Pharmacists' assessments of barriers were the method utilized to measure the relationship between environmental factors and behavior. In order to maintain consistency in the measurement, personal factors that may form barriers to providing non-dispensing services to underserved populations were also found in the literature. Pharmacists were asked to identify which barriers most likely influenced their behavior. Applying barriers as the measurement, the unidirectional relationship of environmental factors and personal factors on behavior was assessed.
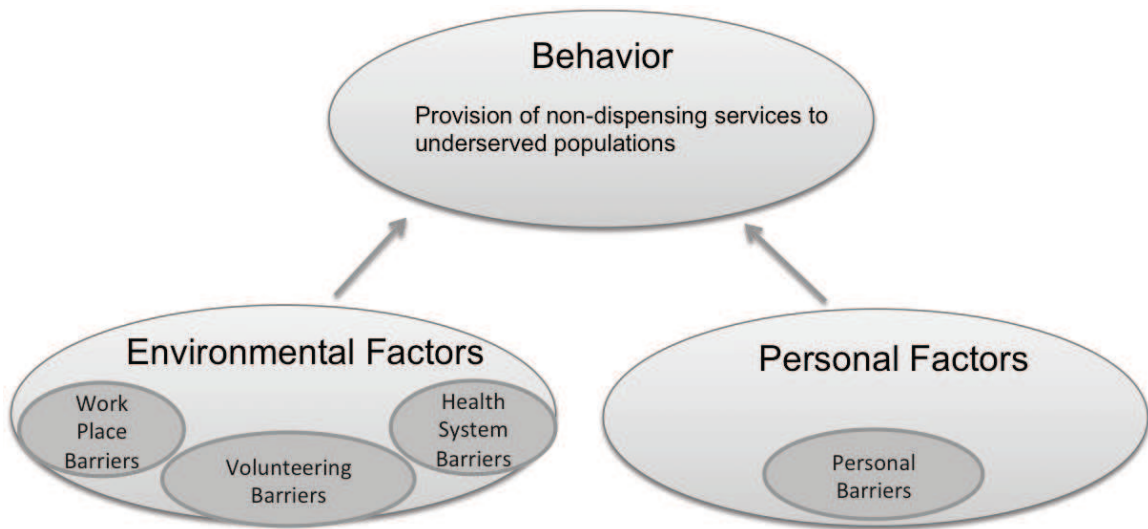
**Figure 3.2: Influence of Environmental and Personal Factors on Behavior**

The Social Cognitive Theory states that each component in the model influences the other two. The goal of objective three, "To identify environmental or personal factors that predict pharmacists' provision of non-dispensing services to underserved populations"is to determine if a distinct group of factors, either environmental or personal, has more influence on behavior. Barriers will still be used as the measure of influence and demographic factors will be added to personal factors being evaluated. Based on the SCT, results of this assessment will indicate whether or not pharmacists are most responsible for their provision of non-dispensing services or if their behavior is being regulated by social structures around them.
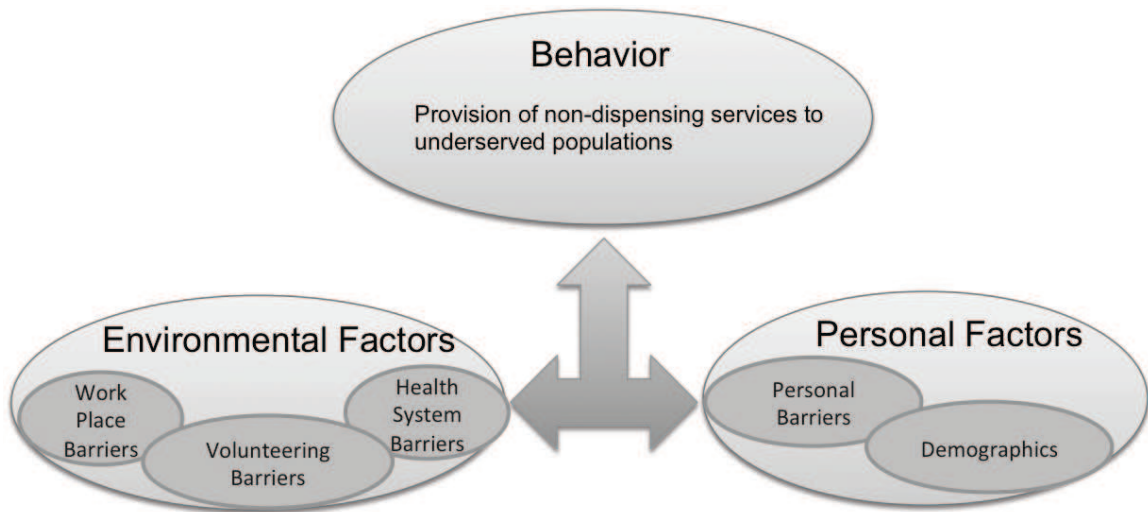
**Figure 3.3: Assessing Factor with Most Influence on Behavior**

Lastly, objectives "to assess if pharmacists are willing to work with underserved patient populations with different characteristics, provide specific non-dispensing services, and provide disease state management for different diseases" (objective 4) and "To assess if pharmacists perceive themselves capable to work with underserved patient populations with different characteristics, provide specific non-dispensing services, and provide disease state management for different diseases" (objective 5) were addressed by isolating the relationship between personal factors and behavior. Due to the large variety in disease states, patient characteristics, and non-dispensing services, pharmacists may have different preferences and levels of training and experience amongst the many potential scenarios they may be asked to participate in. As a result, pharmacists may have preference or comfort zones within they prefer to practice. The success of engaging more pharmacists in providing non-dispensing services may hinge upon identifying patient populations, non-dispensing services, or disease states they prefer. The literature has shown that human agency is the root of an individual's personal factors, which determine

their behavior. It was also found in the literature that in regards to measuring human

agency in surveys, willingness and capabilities are the measures often used. The

relationship between personal factors and behavior was isolated to determine which

services, underserved patient populations, and diseases states pharmacists were most

willing and capable to provide and assist.

Behavior
• Assisting patient populations with
  specific characteristics
• Providing non-dispensing services
• Counseling and managing disease
  states

Personal Factors

Human Agency:
• Willingness
• Capabilities
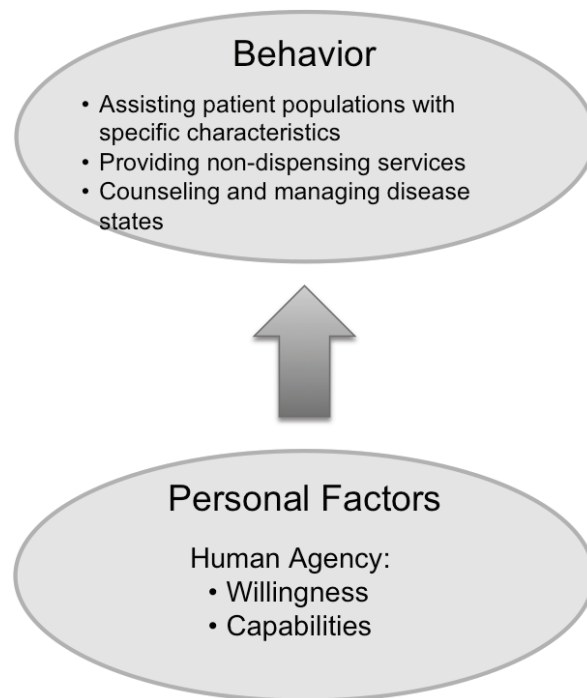
**Figure 3.4: Using Human Agency to Identify Behaviors Pharmacists are Most Likely to Perform**

## 3.2 Study Design

This study was a cross-sectional survey of pharmacists in the State of

Ohio. A survey was designed by the researchers to address the research objectives of this

study using information gathered from the literature and a panel of pharmacists for input.

Participants were selected from a database of all licensed pharmacists in the State of Ohio to receive the survey. Based on a population of 12,529, Raosoft® Sample size calculator determined that 373 participants needed to respond for a 5% margin of error. In order to ensure an adequate sample size, two thousand pharmacists were randomly selected to receive the survey.

Only licensed pharmacist in State of Ohio who were either currently practicing pharmacy, retired, a student, an intern, seeking employment in pharmacy, teaching/research, administrator, consultant, or in the military were included in the sample population. Pharmacists were excluded if they could not provide services to an Ohio population. Selected pharmacists were electronically surveyed from December of 2011 to March of 2012.

## 3.3 Instrumentation

### 3.3.1 Survey Development

The literature review was unsuccessful in identifying a pre-existing survey that could be used or modified for the purpose of this study. To meet the needs of the study a survey was created by applying concepts and conclusions reported in published literature. The initial draft of the survey was distributed to a panel of pharmacists representing many facets of the pharmacy workforce (e.g. academia, retail, clinical, and working with underserved). This panel was asked to review the survey and provide recommendations for improvement.

The purpose of the panel was not to take the survey, but instead to provide recommendations and insight in a variety of areas. First and foremost, they were asked to

assess the survey for face validity. Panel pharmacists were asked to evaluate the content of each section to provide recommendations for items that should be added or removed if deemed unnecessary for the goals of the study. Secondly, they read through the survey to assess directions and items for clarity to ensure that the survey was easy to follow and directions prompted respondents to respond in the desired way. Lastly, they pharmacists evaluated the survey regarding length to provide feedback on response burden of future participants.

The pharmacists had 2 weeks in order to provide their comments.  Participants responded via email with comments and recommendations upon completion of evaluation. Pharmacists did receive follow-up emails, phone calls, or meetings to discuss their comments and provide further insight.

### 3.3.2 Pilot Testing

Upon incorporation of the panel's recommendations, the survey was distributed as a pilot test. The respondents were randomly selected from the list of contact information provided by the State of Ohio Board of Pharmacy. The purpose of the pilot test was to identify survey items or directions that were confusing for respondents or generated a response different from the author's original intent. Participants in the pilot survey were also given the opportunity to provide comments at the end of the survey regarding survey content or clarity. The goal of this section was to further build on the face validity established by the panel of pharmacists.

Pharmacists licensed in Ohio were surveyed using SurveyMonkey™ for the pilot test. A survey link was emailed to the address registered with the State of Ohio Board of

Pharmacy. The pilot survey was mailed to 1,500 randomly selected pharmacists in order to received 100 responses. The surveys were mailed to 500 respondents every two weeks from early October 2011 to mid-November 2011. Three separate groups of 500 were contacting during the six week period until 100 complete responses were gathered.

The results from the pilot test indicated a few changes needed to be made to improve the responses collected. First, directions were reworded for multiple response questions that had answers of either "yes" or "no". Directions were reworded to encourage respondents to click the "no" box if the item did not apply to them versus leaving the item blank.

The most notable change was adding another survey item to distinguish pharmacists who had access to patients at their place of work from pharmacists who did not. The issue that was identified in the pilot test was that pharmacists who were not employed in a setting that had access to patients were leaving survey items about non-dispensing services in the work place blank. When the data analysis plan was conducted on the pilot test data the results were negatively affected for one research objective. After the pilot, respondents were categorized by their opportunity to provide non-dispensing services to patients in their place of work. The data analysis plan was revised to add an analysis specifically for individuals who can provide non-dispensing services at their place of work. The details of this change are explained in the upcoming data analysis section.

### 3.2.2 Final Survey Design

The first two items of the survey were designed to ensure that the inclusion and exclusion criteria of the study were complied with. Respondents are asked "Yes/No" questions regarding their licensure in the State of Ohio and if they are able to provide pharmacy services to a population residing in Ohio. A response of "No" to either of these items will terminate the survey.

The survey was designed with the expectation of using SurveyMonkey™ software to create a flexible survey that could be tailored to individual respondents. The length of the survey and the items that a respondent answers are dependent on their responses to items within the survey. The third survey question on page 4 is the first item that determines the path a participant will follow through the survey. Pharmacists who respond "Yes" to the item that asked if they currently provided non-dispensing services to underserved populations were directed to survey page 5. On this page, participants complete questions four and five regarding the setting where they provide services and the geographic location of that setting. The settings available to choose from are community health center, free medical clinic, pharmacy of employment, and other (asked to specify). The geographic areas respondents were asked to identify were rural, rural-close proximity to suburbia/metropolis, suburban, metropolis, and within primary metropolis.

After completing page 5, participants who responded "yes" to question 3 continued on to page 6 titled, "Willingness, Capabilities, and Involvement with Underserved". On this page pharmacists were asked to indicate which patient characteristics, non-dispensing services, and disease states they were willing and capable

to assist or provide. The items on this page were based upon information provided in the literature review. Each section was designed around a patient or service characteristic that was shown to influence health professionals' practice behavior. The first question, question 6, was based upon income/insurance status. Pharmacists were asked to indicate if they were willing and/or capable providing non-dispensing services to low income, Medicaid/safety net, uninsured, and homeless patients. The second question focused on patient characteristics that were indicated in the literature to affect health professionals' desires to assist underserved populations. Those characteristics were medically complex cases, HIV/AIDS, psychiatric illness/ psychosocial problems, race or ethnicity different than the provider, non-English speaking, criminal record, and illicit drug users.

Pharmacists have shown to have varying levels of confidence providing non-dispensing services. The third question was designed to measure what services they were willing and capable to provide. The services were comprised of components listed in the MTM Core elements 2.0 as well as other frequently provided non-dispensing services. To prevent confusion, the definition of the service was listed rather than the name of the service. The services listed were education on newly prescribed medication, adherence counseling, disease counseling, lifestyle modification counseling, health screening, vaccination, comprehensive medication review, compiling a personal medication record, creation of a medication action plan, participating in a medication therapy management program, providing recommendations to other health professionals for patients, and assisting patients with prescription assistance programs. The fourth question was a list of common diseases from the literature that underserved patients frequently present with or pharmacists have shown to frequently provide non-dispensing services. Those diseases

are Alzheimers, anticoagulation therapy, asthma, cardiovascular diseases, chronic kidney disease (CKD), chronic obstructive pulmonary disorder (COPD), depression, diabetes, dyslipidemia, Hepatitis C, HIV/AIDS, osteoporosis, Parkinson's disease, pain management, and thyroidism.

The four questions were all arranged in a multiple response format where the directions are stated at the beginning of the item. Below the directions are listed each individual component of the category. For example, question 6 listed patient income characteristics. Listed below the directions are the four individual characteristics of low income, Medicaid/ safety net, uninsured, and homeless. The items were designed to identify what areas pharmacists were willing and capable to assist. Each individual category with the question had a box for "willing" and "capable". Pharmacists were requested to check the "willing" box if they felt willing to assist in the specific area of the survey item and "capable" if they perceived themselves as able to execute the requirements of that service.  In order to identify what areas they are currently assisting, pharmacists had an "assisting/providing" box in addition to the check boxes for "willing", "capable", and "decline to answer. If a pharmacist was assisting patients in a specific area they were requested to check the "assisting" box. This allowed researchers to identify what services pharmacists are most frequently providing to underserved populations currently.

For those participants that responded "no" to question 3 on survey page 4 they were directed to page 7 titled, "Willingness and Capabilities in Regards to Underserved Populations". The survey questions are exactly the same in this section as on page 6. However, this group does not provide non-dispensing services to underserved

populations, thus the "assisting" box was not available. Participants on this page were still asked to indicate "willingness" and "capable" for exactly the same items as page 6.

Both groups were routed to page 8 title "Barriers to Working with Underserved Populations" upon completion of the four questions regarding willingness and capabilities. A list of barriers was created and separated into personal barriers and environmental barriers. Environment barriers were further divided into workplace barriers, volunteer barriers, and general health system barriers. Pharmacists were asked to respond to statements regarding reasons they may not provide services using 5-point Likert scales (1= Strongly Disagree to 5= Strongly Agree). Barriers were generated from review of the literature and interviews of pharmacists on the panel that both confirmed barriers from literature as well as proposed additional barriers they experienced.

Personal barriers are examined first in the survey. The statements "I do not feel that I have enough training or experience providing MTM services" was inserted due to studies reporting pharmacists lack of confidence providing MTM services.[65,75] Statements "I feel my assistance will not improve the health condition of underserved populations", "I have had bad experiences working with underserved populations in the past", and "I do not feel that the patients would appreciate my services" were generated from conclusions of a study that conduct a focus group of physicians regarding their willingness to serve the poor.[72] "I am uncomfortable working with underserved populations" was added to measure feelings of uneasiness on behalf of the pharmacists.

Volunteer barriers of, "The closest location that provides services to the underserved is too far away or inconvenient to volunteer at", "I volunteer my time with other initiatives (pharmacy or non-pharmacy related)", "I am hesitant to volunteer before

knowing the time commitment and obligations", and "I do not have the available time currently to volunteer outside work" are statements to identify the availability of pharmacists time and working in underserved population areas. "I do not know where I can volunteer to assist underserved populations" and "I have never been approached by programs or providers that work with underserved populations to assist" were added to represent possible issues caused by pharmacists still transitioning into their role as providers of non-dispensing services rather than solely dispensing.

Literature indicates that physicians and health centers may not fully understand or appreciate the number of services a pharmacist can provide.[43,76-78] Therefore, the statements "I do not feel that health providers would appreciate the services I can provide" were added to address health system barriers pharmacist may encounter when trying to volunteer in support of underserved populations. Additionally, states laws and regulations vary concerning pharmacist provision of non-dispensing services. Pharmacists interviewed for the survey indicated that legal concerns might discourage pharmacists from roles that provide non-dispensing services. Physicians in California, while not a large issue, mentioned increased liability as a reason to not provide primary care to underserved populations.

Per the findings from the pilot study, another question that determined respondents' path through the survey was added. Pharmacists that responded "yes" to the question "Do you have the ability or the opportunity to assist and counsel patients at your place of employment in your current role?" continued to page 9 to identify work place barriers. For the workplace, lacking compensation has been cited as a barrier to implementing MTM services, thus an item was added to assess pharmacist work place

barriers that may be encountered using the statement "I get the impression that the management at my place of work is unwilling or uninterested in providing MTM services to underserved populations". Additionally, workplace constraints of staff, time, and resources have been mentioned in the literature. The barriers of "The staff does not have the time during our shifts to provide non-dispensing services to underserved populations" and "The pharmacy does not have the appropriate resources (materials, space, equipment, etc.) to provide non-dispensing services" were added to address these issues. Additional factors such as not being engaged by the community or being in an area that is hard to access by underserved populations such as suburbs were added to address those barriers.

After completing work place barriers on page 9 or responding "no" to having the ability to assist or counsel patients in the respondents place of work, participants were directed to survey page 10, "Demographic Information". The purpose of the items on the remaining pages was to obtain information regarding the pharmacists' career, demographics, and personal background information. Items were added to assess pharmacists' level of education, areas of specialization, years of practice, and practice setting. Pharmacists are asked to report their age, gender, race, and ethnicity.

## 3.4 Survey Administration

The study survey was mailed on December 1, 2011 to 2,000 pharmacists randomly selected from the State of Ohio Board of Pharmacy mailing list. A weekly reminder was sent every week except for the two weeks around Christmas and New Year's until a sufficient sample size was reached. The survey was closed March 29th, 2012.

Respondents would access the survey via a link supplied on the email mailed to them. Upon completing the survey, the data would be sent to SurveyMonkey. SurveyMonkey collected all of the data and generated spreadsheets available for download.

## 3.5 Data Analysis

Analysis for this study was conducted using SPSS v17.0. Prior to analyzing the objectives of the study the responses were analyzed for response bias. A wave format was used, comparing the first 20% of responders to the last 20%. Normally the time at which responses are gathered is taken into consideration when making groups to compare for non-response bias. Data collection for the study experienced large responses initially which decreased to small numbers of surveys collected weekly for the remaining two months of the study. If a time period was used to make the groups for the analysis than the sample sizes would have been extremely disproportionate.

Non-response bias was analyzed using the variable whether or not the participant was currently providing non-dispensing services to underserved populations and demographic variables (highest level of education, years of practice, practice setting, gender, age, and race/ethnicity). Chi-squared analyses were used to compare current status providing non-dispensing services to underserved populations, highest level of education, practice setting, gender, and race/ethnicity. Independent t-tests were used to compare years of practice experience and age.

Objective 1 was analyzed using descriptive statistical analysis of question 3 on page 4, page 5, and specifically the "assisting" component of each survey item on page 6.

The percentage of pharmacists that answered, "yes" to question 3 indicated the proportion of pharmacists who frequently provide non-dispensing services to underserved populations. The remaining items for this analysis indicated the geographic locations, practice settings, services, and disease states most commonly practiced in or provided to underserved populations.

Objective 2 was answered by finding the mean responses to each barrier listed on pages 8 and 9. The means were compared and ranked from most agreed to least agreed with. The means indicated which barriers were most and least likely to have an impact on behavior for pharmacists in general.

Two logistic regression models were used to address Objective 3. The dependent variable was the response to question 3, which asks if the pharmacist frequently provides non-dispensing services to underserved populations. Independent variables in the model were the barriers as well as demographic and practice information. The first model analyzed all pharmacists surveyed with personal, volunteering, and general health system barriers as well as demographic information as independent variables. The second model was limited to pharmacists that have access to patients in their place of employment. Personal, volunteering, work place, and general health system barriers will be included in this model in addition to demographic variables.

A correlation matrix was used to identify the barriers that have the largest association with pharmacists who are currently providing non-dispensing services. Barriers that were significantly related to current status providing non-dispensing services to underserved patients and stronger correlation coefficients compared to other barriers

were included. Odds ratios indicated which factors were most predictive of barriers to pharmacists when providing non-dispensing services to underserved populations.

Responses for the "willing" and "capable" components addressed Objective 4 and Objective 5. Descriptive analysis of the items in these sections identified the patients and services pharmacists were most willing to assist or provide as well as which patients and services to pharmacists felt they were most capable of assisting or providing. Furthermore, if personal factors were implicated as the primary barrier between pharmacists providing non-dispensing services to underserved populations then the assessment of the survey items in this section could have provided a more specific explanation why these barriers exist.

Pharmacists' education and work place experiences may have an influence on their willing and capabilities. In order to better understand the relationships between these factors contingency tables were made and chi-square analyses were run. Every survey item which requested pharmacists to indicate whether they were willing and/or capable was entered. Those were the items concerning patient income/insurance status, patient characteristics, non-dispensing services, and disease states. Tables were made to compare those items to the pharmacists' work place demographics of highest degree achieved, years of work experience, and work setting. Each individual work setting was analyzed separately from the others. Pharmacists were requested to indicate all work settings that applied. Therefore, making one nominal variable that accounts for all work settings was not possible due to duplicate data. The contingency tables for work setting contained two rows for pharmacists either working in that setting or pharmacists not

working in that setting. The top 5 settings by number of pharmacists employed in that setting were selected to be involved in the analysis.

# Chapter 4

# Results

This chapter is responsible for describing the information collected from the study survey. This section will supply the response rate and the demographics of those responding. The responses to the survey items will be reported. The analysis results will be presented in response to the study objectives stated in Chapter 1.

## 4.1 Survey Response Rate

There were 478 responses to the survey. Out of those responses, 57 pharmacists did not meet the inclusions/exclusion criteria and 59 failed to complete the survey (Fig. 5). After adjusting for the 104 email addresses that were no longer active, the response rate was 19.7%.

There were 363 surveys that were acceptable for analysis. The calculated sample size was 373 for a confidence interval of 95% and margin of error of 5%. The observed sample size of 363 was under the recommended size, which increased the margin of error to 5.05%. This was deemed sufficient based on the fact that responses were fewer with

each reminder and a growing number of pharmacists were expressing annoyance with the amount of reminders they were receiving.
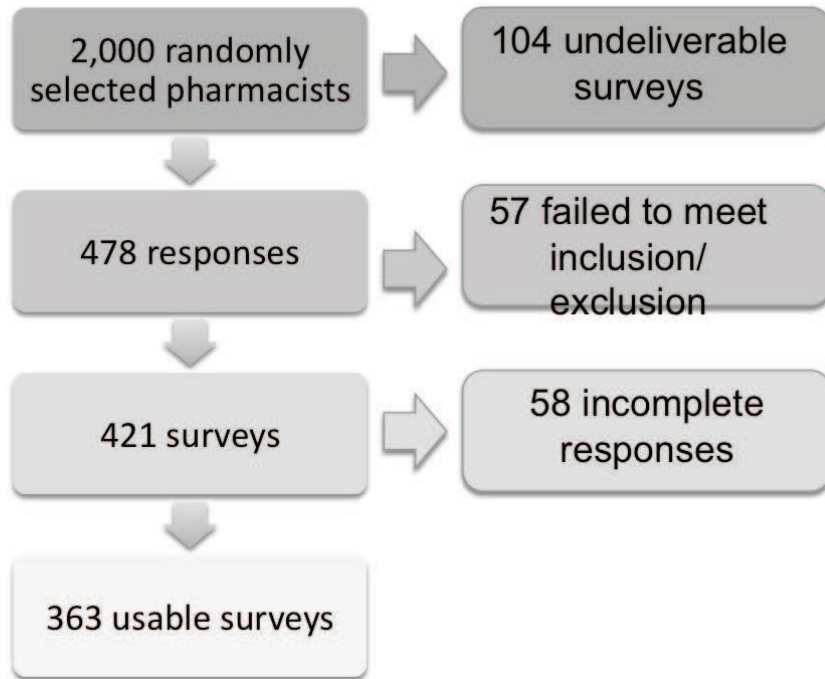


**Figure 4.1: Participant Flow Chart**

## 4.2 Respondent Demographics

Respondents primarily had Bachelor of Science in Pharmacy degrees, average work experience of approximately 20 years (Table 4.1 and 4.2), and worked in either chain retail or hospital settings (Table 4.1). The race of the sample was predominantly Caucasian at 87.6% of respondents. The average age reported was approximately 46 years and gender was fairly evenly distributed between male and female (Table 4.1). Many indicated having earned a board certification in a pharmacy specialty area. The specific area was not included in analysis because only a small fraction of respondents who indicated they possessed a BCPS identified the area of their specialty. Due to the

low response rate to the follow-up question that requested the pharmacists to identify

their specialty, the BCPS demographic variable was removed from further analysis for

fear of incorrect response to the item.

**Table 4.1: Frequencies of Reported Demographic Factors**

| Highest Degree Achieved | N=354 | Frequency |
|---|---|---|
| B.S. Pharm | | 60.17% |
| Pharm. D. | | 29.10% |
| Postdoctoral Residency | | 6.50% |
| Postdoctoral Fellowship | | 1.13% |
| Other | | 3.11% |
| BCPS | | 32.56% |
| **Employment Location** | **N=363** | |
| Academia | | 6.06% |
| Chain Retail | | 33.33% |
| Community Health Center | | 4.13% |
| Hospital | | 30.58% |
| Independent Retail | | 15.43% |
| Infusion | | 2.48% |
| Mail Order | | 6.61% |
| Managed Care | | 2.20% |
| Long Term Care | | 5.79% |
| Outpatient | | 8.26% |
| Retired | | 2.75% |
| **Race** | **N=346** | |
| Caucasian | | 87.60% |
| Black or African American | | 2.48% |
| Asian | | 1.93% |
| Hispanic | | 0.28% |
| Two or More Races | | 0.55% |
| Declined to Respond | | 2.48% |
| **Gender** | **N=340** | |
| Male | | 44.90% |
| Female | | 48.76% |

**Table 4.2: Average Years of Age and Years of Practice**

| | N | Mean | Std Dev |
|---|---|---|---|
| Age | 340 | 46.0 | 13.0 |
| Years Practice Exp. | 325 | 19.7 | 12.5 |

Approximately 72 pharmacists represented 20% of the sample. The first and last

72 participants were compared. The results indicated no difference in responder

demographics or status providing non-dispensing services to underserved populations.

Based on wave analysis, the results indicated that non-responder bias is not present in the

data (Table 4.3).

**Table 4.3: Non-Response Bias Results (Categorical and Continuous Variables)**

| Variable (categorical) | N | Chi-Square | Significance |
|---|---|---|---|
| Providing Services to Underserved | 144 | 0.112 | 0.738 |
| Highest Education | 139 | 3.205 | 0.524 |
| Academia | 137 | 0.057 | 0.811 |
| Hospital | 137 | 0.825 | 0.364 |
| Outpatient | 137 | 1.476 | 0.224 |
| Chain Retail | 137 | .000 | 0.998 |
| Independent Retail | 137 | 1.506 | 0.220 |
| Community Health Center | 137 | 2.315 | 0.128 |
| Mail Order | 137 | .935 | 0.334 |
| Retired | 137 | .256 | 0.613 |
| Managed Care | 137 | .387 | 0.534 |
| Long-term Care | 137 | .442 | 0.506 |
| Infusion | 137 | .165 | 0.685 |
| Gender | 133 | 1.259 | 0.262 |
| Race | 136 | 5.887 | 0.208 |
| Variable (continuous) | N | Mean Difference | Significance |
| Years Experience | 131 | -2.1347 | .994 |
| Age | 130 | -0.4153 | .992 |

## 4.3 Current Pharmacist Involvement

Of the respondents that completed the survey, 156 or 43% of the respondents

indicated that they were currently providing non-dispensing services to an underserved

population. The majority of these pharmacists were providing these services at their

pharmacy of employment in suburban and metropolitan areas (Table 4.4). The insurance/

income status most frequently assisted by pharmacists was low income patients (Fig.

4.2). In regards to patient characteristics, pharmacists reported working most frequently

with medically complex cases (multiple diseases), patients of a different race than

themselves, and patients with psychosocial problems (Fig. 4.3). The service most

pharmacists reported providing was education of a new medication (Fig. 4.4). A number

of pharmacists reported providing comprehensive medication reviews, medication

adherence counseling, and lifestyle modification counseling as well. The largest

percentage of pharmacists were assisting patients with diseases related to metabolic

syndrome x, specifically diabetes, cardiovascular issues, and dyslipidemia (Fig. 4.5).


**Table 4.4: Location and Setting where Pharmacists Provided Non-dispensing services**

| Pharmacists Currently Providing Non-Dispensing Services | 43% |
|---|---|
| **Setting*** | |
| Community Health Center | 13% |
| Free Medical Clinic | 12% |
| Place of Employment | 83% |
| **Location*** | |
| Rural | 31% |
| Rural: Close to suburbia | 35% |
| Suburban | 37% |
| Metropolis | 42% |
| Inner City | 30% |

*Percent based on number of pharmacists who replied "yes" to currently assisting underserved populations (n=156); multiple response were allowed per questions (percentages will exceed 100%)


Homeless patients were reported the fewest by pharmacists for provision of non-

dispensing services (Fig. 4.2). This segment of the population was only assisted by 13.2%

of the total number of pharmacists surveyed. Very few pharmacists also reported working

with illicit drug users and HIV patients. Similarly, HIV and Hepatitis C were disease

69

states that pharmacists reported working with the least (Fig. 4.3 and 4.5). The relationship

might be explained due to the fact that Hepatitis C and HIV are more prevalent in

intravenous drug users. In regards to non-dispensing services, it appears while most

pharmacists provide an aspect of an MTM program, very few pharmacists reported being

a part of a complete MTM program to underserved patients. MTM programs had the least

amount of pharmacists that reported providing that services at 4.7% (Fig. 4.4).
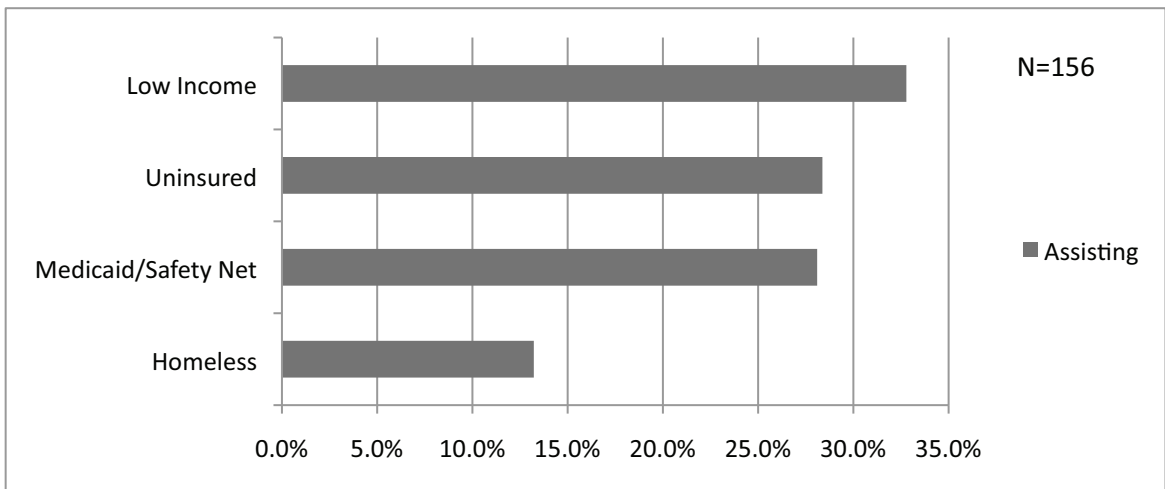


*Percentages are reported based on the total respondent population; not limited to pharmacists who
reported assisting underserved patients

**Figure 4.2: Percentage of Pharmacists Assisting Underserved Patients by
Insurance/Income Status**
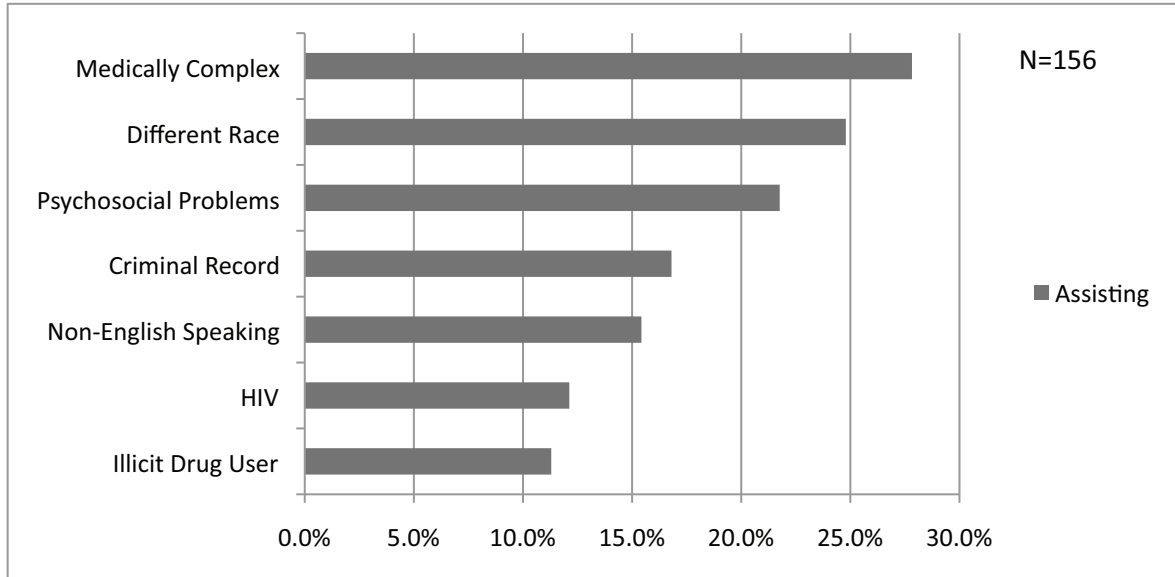
N=156

*Percentages are reported based on the total respondent population; not limited to pharmacists who reported assisting underserved patients

**Figure 4.3: Percentage of Pharmacists Assisting Underserved Patients by Patient Characteristic**
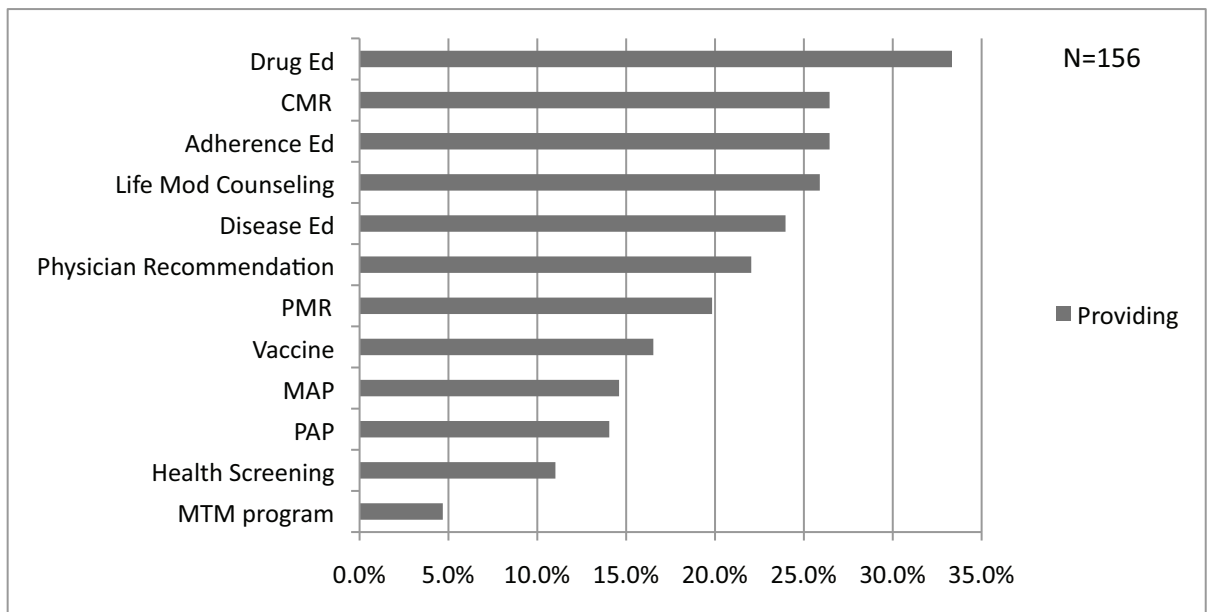


N=156

*Percentages are reported based on the total respondent population; not limited to pharmacists who reported assisting underserved patients. Abbreviations= CMR- comprehensive medication review, PMR-personal medication record, MAP- medication action plan, PAP- prescription assistance program, MTM program- medication therapy management program

**Figure 4.4: Percentage of Pharmacists Providing Specific Non-Dispensing Services to Underserved Populations**
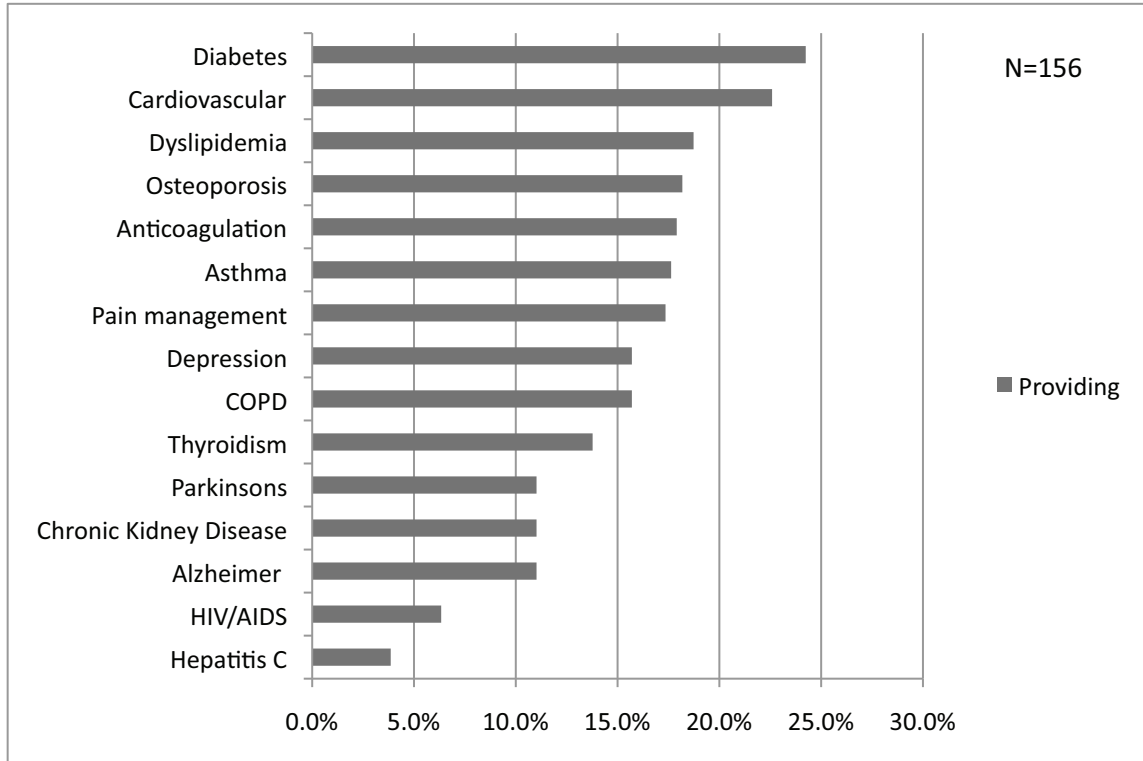
*Percentages are reported based on the total respondent population; not limited to pharmacists who reported assisting underserved patients.

**Figure 4.5: Percentage of Pharmacists Providing Non-Dispensing Services to Underserved Patients by Disease**

## 4.4 Pharmacists' Willingness to Assist Underserved Populations

Overall pharmacists indicated to be very willing to assist underserved populations. The percentage of pharmacists who indicated to be willing for each item ranged from 50% to 75% (Fig. 4.6-9). The graphs are designed to display the total number of pharmacists who indicated that they are "willing" to assist the patient population or provide the service in question. Pharmacists that responded "willing" had two possible ways to do so. Pharmacists could indicate that they were only "willing" or both "willing and capable." The graphs used a two tune colored line to differentiate

between the two groups. It is important to note that based on the SCT, pharmacists that responded both "willing and capable" are more likely to perform the behavior. Therefore, the darker lines on the graph indicate the percentage of pharmacist most likely to perform the behavior in questions.

The data indicated a relationship between the percentage of pharmacists who were "willing and capable" and the percentage of pharmacists stated they were only "willing". Usually, if one category decreased the other increased to achieve a total percentage around 65-70%. For example, the percentage of pharmacists who were "willing" and "capable" to assist Hepatitis C patients was very low at 12.9%. Conversely, the percentage of pharmacists that identified themselves as only "willing" was extremely high at 50.7%. This may indicate that regardless of the population, disease state, or non-dispensing services pharmacists are generally willing to assist even if they do not feel capable in that area.

The Social Cognitive Theory would predict that if environmental factors remained consistent across a pharmacist population, those that indicated both "willing" and "capable" would most likely be involved with the provision of non-dispensing services to underserved populations. The areas that received the highest percentages of pharmacists marking both were very similar to the areas with high pharmacist involvement. In the category of income/insurance status, low income populations were identified as the populations pharmacists were most willing and capable to work with (Fig. 4.6). Similarly, the patient characteristics pharmacists were most willing and capable to work with were medically complex and patients of a different race/ethnicity (Fig. 4.7). The disease state

and non-dispensing services also remained at the top, however, the order slightly changed (Fig. 4.8 and 4.9).

The areas of patient characteristics and non-dispensing services had the largest difference in willingness across the individual categories. Pharmacists indicated that they were not as willing to work with non-English speaking patients (58%) and HIV patients (50%) compared to medically complex patients at 75% of those surveyed. Pharmacists also appeared to be adverse to providing vaccinations. The category of non-dispensing services was a relatively close range from 66%-75% when vaccination was not included. The large difference between vaccinations and the rest of the category may indicate pharmacists possibly dislike this particular service.
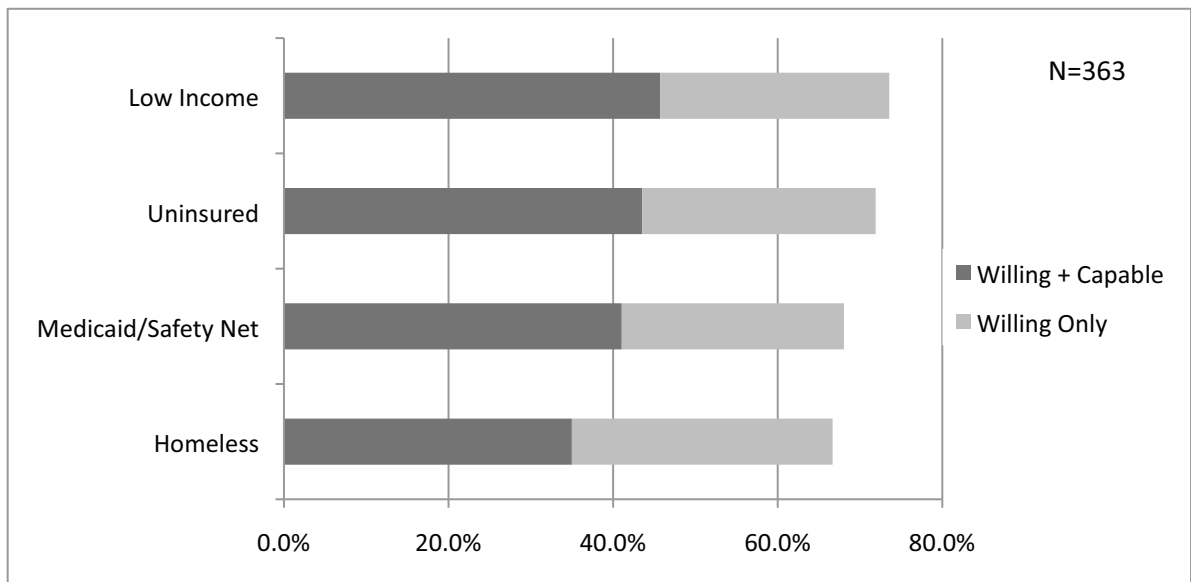


**Figure 4.6: Percentage of Pharmacists Willing to Assist Patients by Income/Insurance Status**
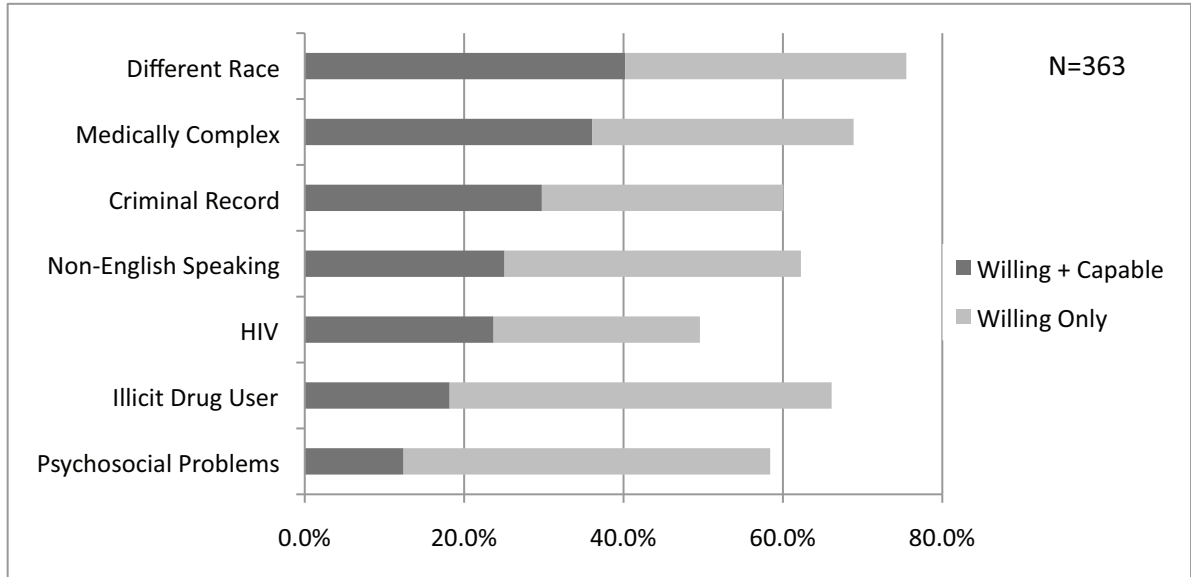
**Figure 4.7: Percentage of Pharmacists Willing to Assist Patients by Patient Characteristic**
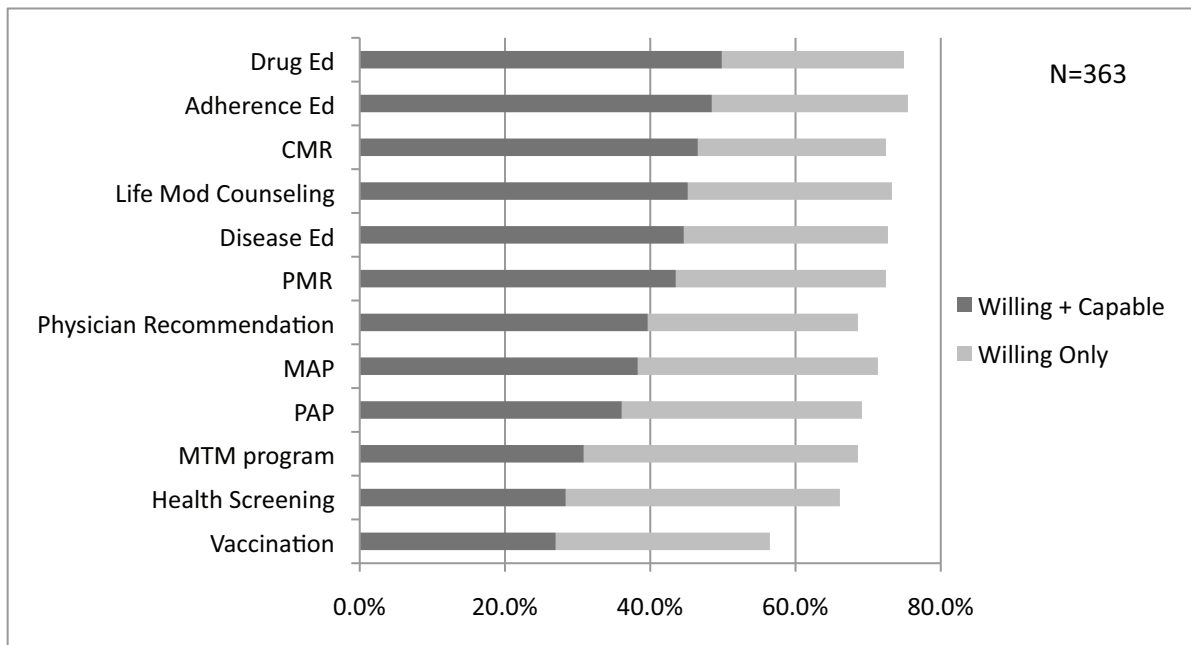


Abbreviations= CMR- comprehensive medication review, PMR- personal medication record, MAP- medication action plan, PAP- prescription assistance program, MTM program- medication therapy management program

**Figure 4.8: Percentage of Pharmacists Willing to Provide Non-Dispensing Services to Underserved Populations by Service**
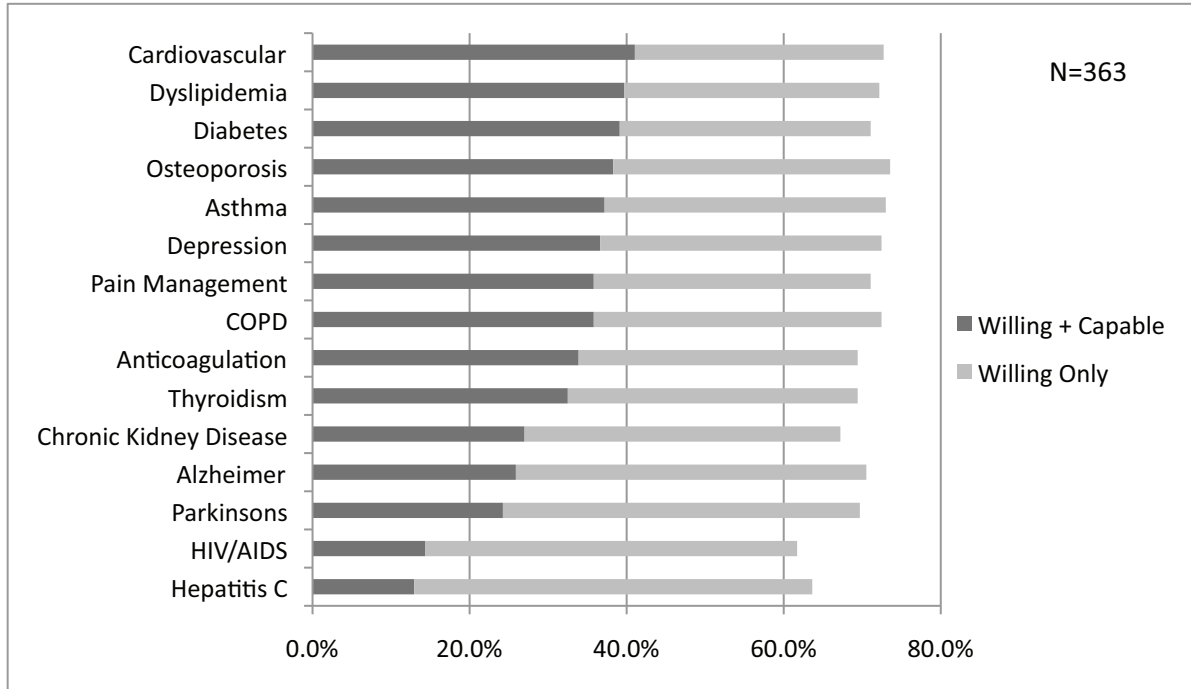
**Figure 4.9: Percentage of Pharmacists Willing to Assist Patients by Disease State**

## 4.5 Pharmacists' Perceived Capabilities Assisting Underserved Patients

A smaller percentage of pharmacists reported themselves as capable to assist in the variety of areas and with patients with different characteristics by approximately 10% per item (Fig. 4.10-13). When all subcategories were included, the percentage of pharmacists that reported themselves as capable ranged from 18.7%-60.9%. The graphs are designed to display the total number of pharmacists who indicated that they are "capable" to assist the patient population or provide the service in question. Pharmacists what responded "capable" had two possible ways to do so. Pharmacists could indicate that they were only "capable" or both "willing and capable." The graphs used a two tune colored line to differentiate between the two groups. It is important to note that based on the SCT, pharmacists that responded both "willing and capable" are more likely to

perform the behavior. The darker lines on the graph indicate the percentage of pharmacist most likely to perform the behavior in questions. Unlike pharmacists' response to willingness, if the percentage of pharmacists that reported themselves as both "willing and capable" decreased so did the overall percentage of pharmacists identifying themselves as "capable". As a result, a few items were distinguished from the others as areas pharmacists did not perceived themselves as capable in.

The highest and lowest areas of capability remained fairly consistent with the areas in the assisting and willingness sections. Low income patients were reported as the income/insurance status the most pharmacists felt capable working with. In regards to patient characteristics, patients of a different race other than the provider and medically complex patients were perceived as capable areas for pharmacists (Fig. 4.10). Drug education, adherence education, and comprehensive medication review remained the on top as the most frequently reported area of confidence for pharmacists (Fig. 4.11). Similarly, cardiovascular disease, dyslipidemia, and diabetes were also the most frequent disease states pharmacists reported feeling capable working with (Fig. 4.12).

In regards to the items receiving the fewest pharmacists identifying themselves as capable, homeless patients was the lowest group for income/ insurance status. The spread within items in this category was very close ranging from 52.3%-58.1% (Fig. 4.13), which may indicate that pharmacists' capabilities are not influenced greatly by income status. For patient characteristics, non-English speaking (18%) and HIV (27.5) were the lowest in the category and at the bottom across all categories. The non-dispensing of service of vaccinations and disease states of HIV and Hepatitis C were also on the bottom of their categories following suit with the other areas of willingness and assisting.
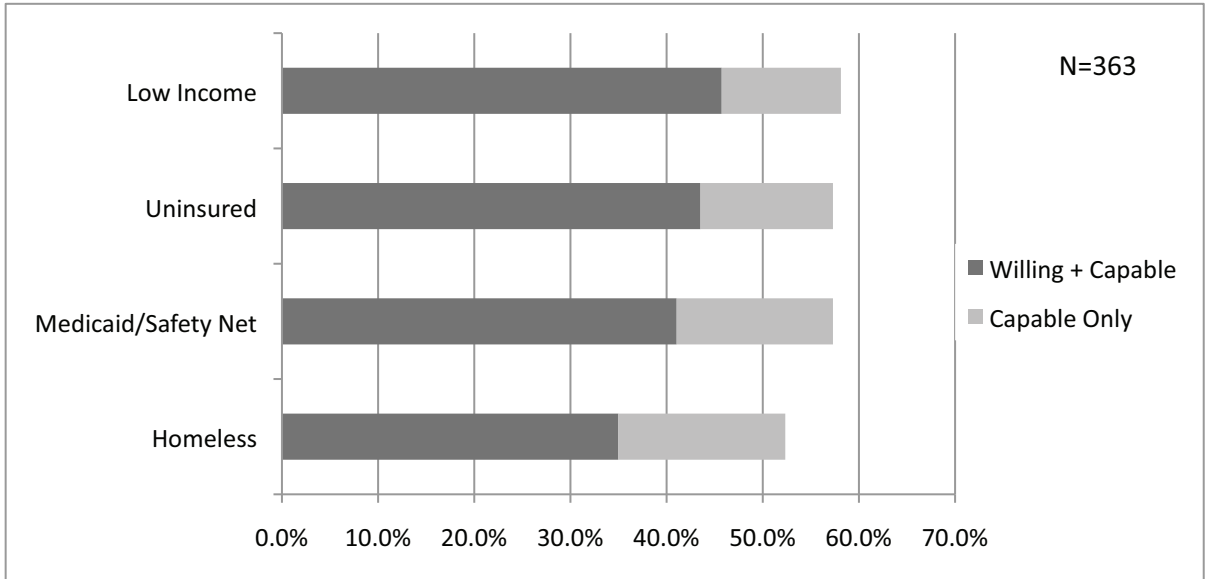
**Fig. 4.10: Pharmacists' Perceived Capabilities Assisting Patients by Income/Insurance Status**
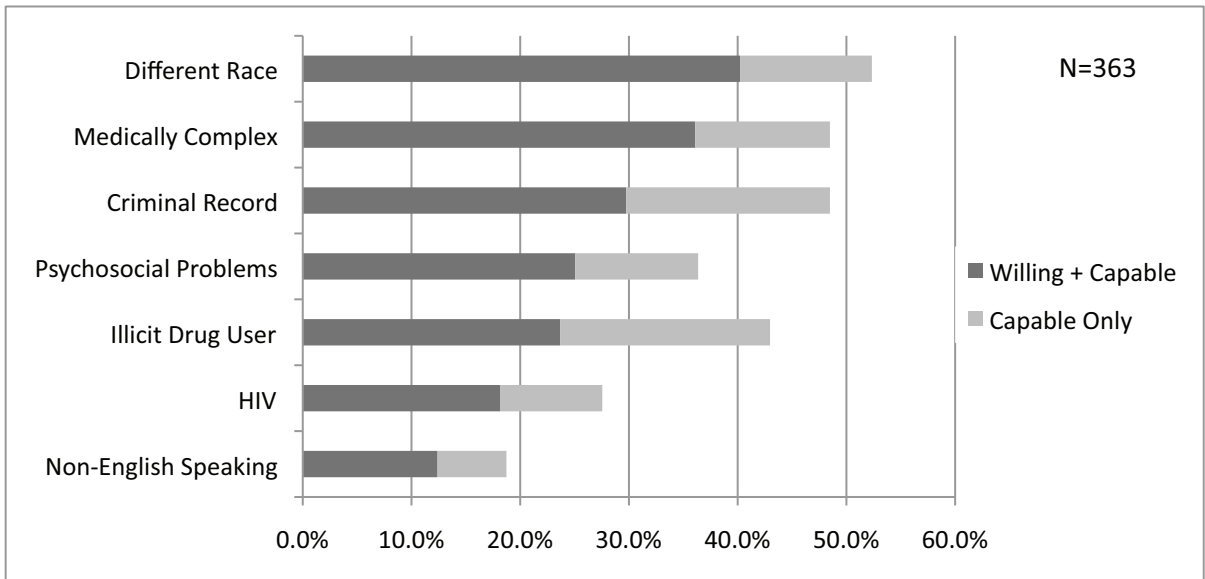


**Fig. 4.11: Pharmacists' Perceived Capabilities Assisting Patients by Patient Characteristics**
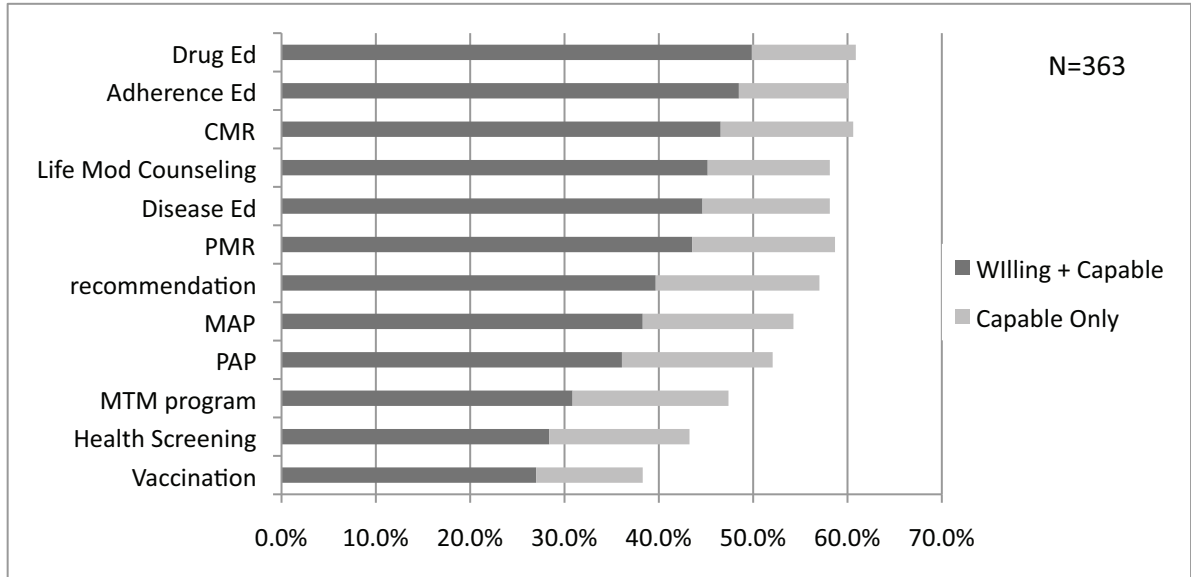
Abbreviations= CMR- comprehensive medication review, PMR- personal medication record, MAP-medication action plan, PAP- prescription assistance program, MTM program- medication therapy management program

**Fig. 4.12: Pharmacists' Perceived Capabilities Providing Non-Dispensing Services to Underserved Patients by Service**
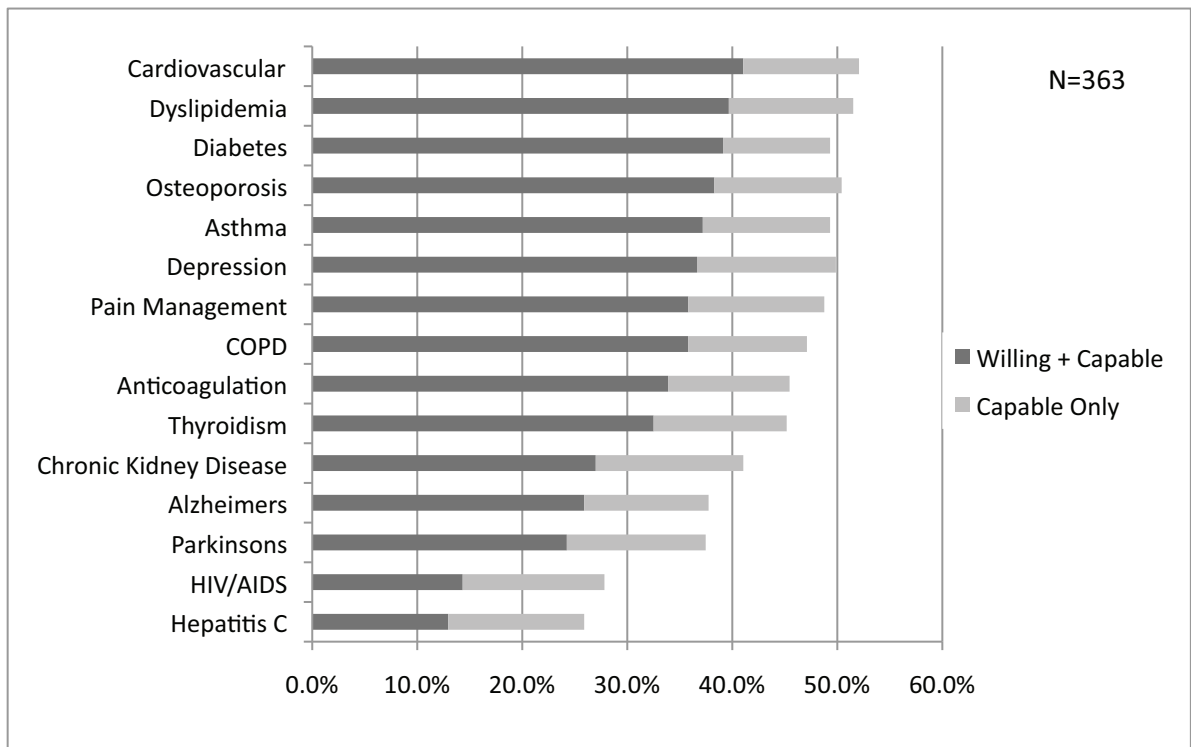


**Fig. 4.13: Pharmacists' Perceived Capabilities Assisting Underserved Patients by Disease State**

## 4.6 Differences in Willingness and Capabilities by Pharmacist Work Experience Demographics

Significant differences were identified between pharmacist groups' willingness and capabilities when compared based on work place demographic variables. Most of the differences were found when comparing willingness and capabilities by highest degree achieved and years of work experience (Table 4.5) Many of the variables found significant were similar because of the close correlation in years work experience and highest degree achieved. Pharmacists that have graduate after 2005 all received a Pharm. D. degree upon completion of their program. As a result, 66% of pharmacists that have Pharm. D. degree as their highest decree achieved have one to eight years of work experience.

Pharm. D. degree holders tend to identify themselves as more willing and capable compared to pharmacists with B.S. Pharm. degrees. Not every category was significant results indicating that overall pharmacists generally have similar willingness and capabilities. When the significant variables are compared in Table 4.5 to Figs. 4.5-4.13, the variables showing a significant difference in highest degree groups and years working experience tend to receive low percentages of pharmacists that are willing and capable and willing or capable (Appendix B). Pharmacists with one to eight years of work experience were the group that was significantly different from the rest in regards to work experience. They tended to be more willing and capable than pharmacists with 9 or more years experience.

**Table 4.5: Differences in Willingness and Capabilities in regards to Patient Characteristics, Non-Dispensing Services, and Disease states for Groups based on Highest Degree Achieved and Years Work Experience**

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| Patient Characteristics | Highest Degree Achieved | | Years Work Experience | |
|---|---|---|---|---|
| | $X^2$ | Sig. | $X^2$ | Sig. |
| Low Income | 21.718 | 0.153 | 9.749 | 0.879 |
| Medicare/ SN | 20.0723 | 0.217 | 14.090 | 0.592 |
| Uninsured | 14.817 | 0.538 | 11.222 | 0.796 |
| Homeless | 12.219 | 0.729 | 16.269 | 0.434 |
| Medically Complex | **27.957** | **0.032** | **33.988** | **0.005** |
| HIV/AIDS | 19.755 | 0.231 | **38.307** | **0.001** |
| Psychosocial Disorder | 14.737 | 0.544 | 10.845 | 0.819 |
| Difference Race | 12.085 | 0.738 | 18.657 | 0.287 |
| Non-English Speaking | 18.605 | 0.290 | **30.677** | **0.015** |
| Criminal Record | 20.182 | 0.212 | 17.613 | 0.347 |
| Illicit Drug User | 25.64 | 0.059 | **41.283** | **0.001** |
| **Non-Dispensing Services** | | | | |
| Drug Education | 16.316 | 0.431 | 9.898 | 0.872 |
| Adherence Counseling | 15.824 | 0.465 | 15.449 | 0.492 |
| Disease Education | 25.400 | 0.063 | 22.763 | 0.120 |
| Lifestyle Modication | 16.095 | 0.446 | 15.522 | 0.487 |
| Health Screening | 23.197 | 0.109 | 21.514 | 0.160 |
| Vaccination | **36.953** | **0.002** | 22.806 | 0.119 |
| CMR | **27.085** | **0.041** | 11.700 | 0.764 |
| PMR | 23.421 | 0.103 | 19.783 | 0.230 |
| MAP | 23.075 | 0.112 | **33.416** | **0.007** |
| MTM Program | 20.286 | 0.208 | 25.034 | 0.069 |
| Physician Recommendation | 24.231 | 0.085 | 17.217 | 0.372 |
| PAP | 18.253 | 0.309 | 15.384 | 0.497 |
| **Disease States** | | | | |
| Alzheimer's | 16.135 | 0.444 | 19.574 | 0.240 |
| Anticoagulation | **46.577** | **0.000** | **35.024** | **0.004** |
| Asthma | **29.065** | **0.024** | **29.847** | **0.019** |
| Cardiovascular | 24.026 | 0.089 | 26.027 | 0.054 |
| Chronic Kidney Disease | 22.442 | 0.129 | **31.293** | **0.012** |
| COPD | **28.174** | **0.030** | 18.367 | 0.303 |
| Depression | 24.108 | 0.087 | 16.469 | 0.421 |
| Diabetes | 21.062 | 0.176 | 17.327 | 0.365 |
| Dyslipidemia | 21.126 | 0.174 | 16.676 | 0.407 |
| Hepatitis C | **30.284** | **0.017** | **31.38** | **0.012** |
| HIV/AIDS | **29.501** | **0.021** | **39.800** | **0.001** |

| | | | | |
|---|---|---|---|---|
| Osteoporosis | 16.527 | 0.417 | 9.386 | 0.897 |
| Pain Management | 16.757 | 0.401 | 10.447 | 0.842 |
| Parkinson's | 16.911 | 0.391 | 18.529 | 0.294 |
| Thryoidism | 16.135 | 0.444 | 22.158 | 0.138 |

Work setting seemed to differentiate pharmacists less than highest degree achieved and years work experience (Table 4.6). Most variables indicated no difference between pharmacists groups except for few categories per each work setting. The top five work settings that employed the most pharmacists in the sample were chain retail, hospital pharmacy, independent retail, outpatient pharmacy, and mail order pharmacy. Outpatient pharmacy and mail order pharmacy were not reported in the graph because the pharmacists that worked in those settings were not significantly different from other pharmacists for any variable (Appendix B).

Independent pharmacists appeared to be the group that was most different from other work settings. There were more variables that independent pharmacists were more willing and capable to do than indicated by pharmacists not working in the independent retail setting. Hospital pharmacists were unique for the fact that if they were significantly different for a non-dispensing service or disease state from pharmacists not working in the hospital setting it was usually caused by an increase in the number of pharmacists indicating themselves as capable (Appendix B). This would indicate that Hospital pharmacists are less willing than other groups to provide non-dispensing services to underserved populations. Other significantly different groups for a certain variable were different because of a larger number of pharmacists indicating themselves as both willing and capable. Hospital pharmacists while having a lower number of pharmacists that

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reported neither willing or capable or declined to respond did not indicate to be as willing

to provide the service or assist patients with a specific disease state.

**Table 4.6: Differences in Willingness and Capabilities in regards to Patient Characteristics, Non-Dispensing Services, and Disease states for Groups based on Work Setting**

| | **Chain Retail** | | **Hospital** | | **Independent Retail** | |
|---|---|---|---|---|---|---|
| **Patient Characteristics** | | | | | | |
| Low Income | 2.757 | 0.599 | 5.503 | 0.239 | 7.279 | 0.122 |
| Medicare/ SN | 3.121 | 0.538 | 5.001 | 0.287 | 8.903 | 0.064 |
| Uninsured | 3.980 | 0.409 | **10.842** | **0.028** | 6.38 | 0.173 |
| Homeless | 1.880 | 0.758 | 4.969 | 0.29 | **9.594** | **0.048** |
| Medically Complex | 6.208 | 0.184 | 2.95 | 0.566 | 4.591 | 0.332 |
| HIV/AIDS | 7.354 | 0.118 | 4.669 | 0.323 | 1.396 | 0.845 |
| Psychosocial Disorder | 7.338 | 0.119 | 9.246 | 0.055 | **11.24** | **0.024** |
| Difference Race | 5.481 | 0.241 | 3.213 | 0.523 | 5.758 | 0.218 |
| Non-English Speaking | **13.280** | **0.010** | 5.352 | 0.253 | 0.921 | 0.922 |
| Criminal Record | 3.743 | 0.442 | 4.065 | 0.397 | 5.456 | 0.244 |
| Illicit Drug User | 1.684 | 0.794 | 2.973 | 0.562 | 4.846 | 0.303 |
| **Non-Dispensing Services** | | | | | | |
| Drug Education | 6.692 | 0.153 | **14.495** | **0.006** | 6.134 | 0.189 |
| Adherence Counseling | 1.506 | 0.826 | 7.839 | 0.098 | 9.388 | 0.052 |
| Disease Education | 2.970 | 0.563 | 8.772 | 0.067 | 8.933 | 0.063 |
| Lifestyle Modication | 3.319 | 0.506 | 6.883 | 0.142 | 8.224 | 0.084 |
| Health Screening | 2.967 | 0.563 | 8.067 | 0.089 | **12.678** | **0.013** |
| Vaccination | **29.846** | **0.000** | **17.16** | **0.002** | 7.985 | 0.092 |
| CMR | 6.663 | 0.155 | 6.254 | 0.181 | 6.163 | 0.187 |
| PMR | 4.556 | 0.336 | 7.654 | 0.105 | 7.951 | 0.093 |
| MAP | 5.343 | 0.254 | 0.546 | 0.969 | 9.168 | 0.057 |
| MTM Program | 0.867 | 0.929 | 4.475 | 0.346 | **14.662** | **0.005** |
| Physician Recommendation | 2.500 | 0.645 | 4.278 | 0.370 | 5.241 | 0.263 |
| PAP | 2.741 | 0.602 | 7.771 | 0.100 | 3.546 | 0.471 |
| **Disease States** | | | | | | |
| Alzheimer's | 2.733 | 0.603 | 3.296 | 0.510 | **13.130** | **0.011** |
| Anticoagulation | 0.519 | 0.972 | 5.360 | 0.252 | 4.274 | 0.370 |
| Asthma | 3.556 | 0.469 | 4.942 | 0.293 | 7.523 | 0.111 |
| Cardiovascular | 1.543 | 0.819 | 5.723 | 0.221 | 6.665 | 0.155 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Chronic Kidney Disease | 2.152 | 0.708 | 2.536 | 0.638 | 3.001 | 0.558 |
| COPD | 2.137 | 0.711 | 7.106 | 0.130 | 4.950 | 0.292 |
| Depression | 1.513 | 0.824 | **14.826** | **0.005** | **10.072** | **0.039** |
| Diabetes | 2.195 | 0.700 | 7.807 | 0.099 | **13.591** | **0.009** |
| Dyslipidemia | 1.571 | 0.814 | 6.659 | 0.155 | 9.198 | 0.056 |
| Hepatitis C | 7.593 | 0.108 | 5.817 | 0.213 | 0.934 | 0.920 |
| HIV/AIDS | 5.020 | 0.285 | 3.363 | 0.499 | 1.277 | 0.865 |
| Osteoporosis | 1.600 | 0.809 | 7.009 | 0.135 | 5.615 | 0.230 |
| Pain Management | 2.522 | 0.641 | 3.539 | 0.472 | **12.808** | **0.012** |
| Parkinson's | 0.730 | 0.948 | 2.386 | 0.665 | 3.035 | 0.552 |
| Thryoidism | 1.593 | 0.810 | 5.953 | 0.203 | 4.493 | 0.343 |

## 4.6 Differences Between Pharmacists Providing and not Providing Non-Dispensing Services to Underserved Patients

Pharmacists who were not assisting underserved populations at the time of the study tended to agree more with the barriers listed in the survey. In order to make comparisons, the numerical values of associated with the Likert scale were averaged (1=Strongly Agree to 5=Strongly Disagree) for each barrier and barriers were ranked based on mean value. Reponses to barriers by pharmacists not assisting underserved patients ranged from 2.11 – 3.90. In comparison, pharmacists assisting underserved patients disagreed slightly more with the barriers, with averages ranging from 2.48-4.27.

Pharmacists tended to respond similarly to barriers regardless of their current involvement with underserved populations (Table 4.7). The category of volunteering contained the largest number of barriers pharmacists encountered. Pharmacists reported barriers of being hesitant to volunteer before understanding the commitment, never being approached by an organization to assist underserved populations, and being unsure where to volunteer. Work place barriers of having insufficient time to assist underserved

populations and not having the right resources to provide non-dispensing services (pharmacists not assisting only) were mentioned as well.

Pharmacists identified personal barriers as least likely to prevent them from working with underserved populations. The barriers that had the most disagreement were the same across both assisting and not assisting groups. Pharmacists indicated feelings that their efforts will not make a difference in the health of the patients was the barrier they most disagreed with (Table 4.7). The barriers of not being interested, feeling uncomfortable working with underserved populations, perceiving the patients as unappreciative, and undergoing a bad experience in the past were also listed as least agreed with for both groups just in slightly different order of most disagreement.

**Table 4.7: Barriers Most and Least Agreed With By Pharmacists Assisting/ Not Assisting**

| Assisting | | Not Assisting | |
|---|---|---|---|
| Barriers Most Agreed With | Avg | Barrier Most Agreed With | Avg |
| Hesitant to Volunteer Before Knowing Commitment (V) | 2.48 | Hesitant to Volunteer Before Knowing Commitment (V) | 2.11 |
| Never Approached to Assist (V) | 2.67 | Never Approached to Assist (V) | 2.15 |
| Volunteer with Other Initiatives (V) | 2.75 | Not Enough Time During Shift (W) | 2.26 |
| Unsure Where to Volunteer (V) | 3.13 | Insufficient Resources at Work (W) | 2.50 |
| Not Enough Time During Shift (W) | 3.13 | Unsure Where to Volunteer (V) | 2.52 |
| Barrier Least Agreed With | Avg | Barrier Least Agreed With | Avg |
| Assistance Will Not Make Difference (P) | 4.27 | Assistance Will Not Make Difference (P) | 3.90 |
| Not Interested (P) | 4.27 | Uncomfortable Assisting (P) | 3.87 |
| Uncomfortable Assisting (P) | 4.10 | Not Interested (P) | 3.69 |
| Patients are Unappreciative (P) | 3.99 | Bad Experiences in Past (P) | 3.67 |
| Bad Experiences in Past (P) | 3.93 | Patients are Unappreciative (P) | 3.66 |

- (P)= Personal Barrier; (V)= Volunteering Barrier; (W)= Work Place Barrier

Two regression models were created to determine barriers and demographic factors that influence whether or not pharmacists provided non-dispensing services to underserved populations. Due to the large number of barriers and demographic variables, a correlation matrix was created to identify barriers that have the strongest relationship to pharmacists' current status of providing non-dispensing services (Appendix C). All of the barriers save one showed a significant correlation. The correlations were predominantly weak with Pearson correlation coefficients ranging from -0.128 to -0.452. They all indicated that pharmacists who were currently not working with underserved populations were more likely to agree with the barrier (Providing status 1=yes, 2=no/ Barrier 1=strongly agree- 5=strongly disagree).

Barriers were selected for the model if the correlation was greater than |0.2|. The |0.2| mark was an approximate median in the range of correlation coefficients. By using this value as the cut-off it allowed barriers from each category to be represented in the model while reducing the number of barrier variables by roughly half. The personal barriers that were entered into the model were not interested in the care of underserved populations, feelings that their efforts will not be able to make a difference in the health of underserved patients, and perceptions that they do not have enough training to adequate provide non-dispensing services. Volunteering barriers that were entered into the model were unsure where to volunteer to assist underserved patients, pharmacists never being approached to assist with underserved patients, and the locations to assist with underserved populations are to inconvenient. Only one of two health services barriers was added and that barrier was pharmacist feelings that other health professions will not appreciate their assistance.

Two regression models were created because some areas of employment for pharmacists do allow pharmacists the opportunity to provide non-dispensing services in their work place. The first model incorporated all pharmacists and the aforementioned personal, volunteering, and general health services barriers. Demographic variables of highest degree achieved, location of employment, years of work experience, age, gender, and race. The model showed to fit the data well with a Hosmer and Lemeshow test of p=.503.

The barriers that the model found to significantly predict the pharmacists current status providing non-dispensing services to underserved populations were not interested in that area of pharmacy and unsure where to volunteer (Table 4.8). Both barriers predicted a greater chance of not assisting underserved with odds ratios of .589 (not interested) and .660 (unsure where to volunteer). The model also showed that pharmacists working in mail order or long term care settings were least likely to be involved with providing non-dispensing services to underserved populations with odds ratios of .301 and .865 respectfully.

**Table 4.8: Logistic Regression Output for Model 1- All Pharmacists with Personal, Volunteering, and General Health System Barriers**

| Variable | 95% C.I. for Odds Ratio | | Odds Ratio | Sig. |
|---|---|---|---|---|
| | Lowest | Highest | | |
| Not Enough Training or Experience (P) | .560 | 1.005 | .750 | .054 |
| Assistance Will Not Improve Health (P) | .708 | 1.645 | 1.080 | .722 |
| **Not Interested (P)** | **.416** | **.833** | **.589** | **.003** |
| **Unsure Where to Volunteer (V)** | **.466** | **.935** | **.660** | **.019** |
| Never Approached to Assist (V) | .675 | 1.351 | .955 | .795 |
| Inconvenient Location to Volunteer (V) | .463 | 1.065 | .702 | .096 |
| Not Welcomed by other Health Prof. (H) | .592 | 1.094 | .804 | .165 |
| Highest Degree: BS Pharm. | Reference Category | | | |
| Highest Degree: Pharm. D. | .573 | 3.184 | 1.350 | .492 |

| | | | | |
|---|---|---|---|---|
| Highest Degree: Residency | .542 | 9.059 | 2.215 | .268 |
| Highest Degree: Fellowship | .000 | | 4.468e8 | .999 |
| Highest Degree: Other | .274 | 18.464 | 2.249 | .451 |
| Years Work Experience | .942 | 1.095 | 1.016 | .680 |
| Employment: Academia | .224 | 4.223 | .973 | .971 |
| Employment: Hospital | .123 | 1.163 | .572 | .123 |
| Employment: Outpatient | .866 | 8.570 | 2.725 | .086 |
| Employment: Chain Retail | .576 | 2.242 | 1.136 | .713 |
| Employment: Independent Retail | .700 | 3.334 | 1.527 | .287 |
| Employment: Community Health Center | .078 | 2.385 | .430 | .334 |
| **Employment: Mail Order** | **.070** | **.301** | **.047** | **.001** |
| Employment: Retired | .012 | 1.225 | .119 | .074 |
| Employment: Managed Care | .064 | 2.805 | .423 | .373 |
| **Employment: Long Term Care** | **.064** | **.865** | **.235** | **.029** |
| Employment: Infusion | .071 | 3.804 | .519 | .519 |
| Age | .913 | 1.049 | .979 | .548 |
| Gender: Female | .578 | 2.06 | 1.093 | .785 |
| Gender: Male | Reference category | | | |
| Race: Caucasian | Reference category | | | |
| Race: African American | .000 | | .000 | .999 |
| Race: Asian | .000 | | .000 | .999 |
| Race: Hispanic | .000 | | .000 | .999 |
| Race: Two or More Races | .000 | | .000 | .999 |
| Constant | | | $1.211e^{42}$ | 1.000 |

- Dependent variable response "yes"=0 for model; N= 304; reference variables for employment were not working in that setting
- (P)= Personal Barrier; (V)= Volunteering Barrier; (W)= Work Place Barrier

 

The second model was limited to pharmacists that had access to patients at work and added work place barriers to the list of variables from the first model. All of the work place barriers had coefficients above the |0.2| cut-off and were added to the model. The resulting analysis showed that the model fit the data well with a Hosmer and Lemeshow test value of p=0.115. The variable of not interested was the only variable from model 1 to remain a significant predictor of pharmacist involvement with underserved populations (Table 4.9). The barriers of work place had never been approached to assist with providing care to underserved populations, insufficient time during work shifts to assist, and place of employment is not in a location easily accessible to underserved populations

were identified as significant predictors with odds ratios of .557, .537, and .487

respectfully. Unlike in the previous model, no work setting was found to be predictive of

providing non-dispensing services to underserved populations.

**Table 4.9: Regression Output for Model 2- Limited to Pharmacists with Access to Patients in Their Work Place with Personal, Volunteering, General Health System, and Work Place barriers**

| Variable | 95% C.I. for Odds Ratio | | Odds Ratio | Sig. |
|---|---|---|---|---|
| | Lowest | Highest | | |
| Not Enough Training or Experience (P) | .690 | 1.647 | 1.066 | .774 |
| Assistance Will Not Improve Health (P) | .901 | 2.908 | 1.619 | .107 |
| **Not Interested (P)** | **.251** | **.783** | **.443** | **.005** |
| Unsure Where to Volunteer (V) | .529 | 1.484 | .886 | .645 |
| Never Approached to Assist (V) | .561 | 1.449 | .901 | .668 |
| Inconvenient Location to Volunteer (V) | .799 | 2.738 | .1479 | .213 |
| Not Welcomed by other Health Prof. (H) | .708 | 1.697 | 1.096 | .682 |
| **Employer Never Approached to Assist (W)** | **.349** | **.891** | **.557** | **.015** |
| Management Seems Unwilling (W) | .577 | 1.572 | .953 | .849 |
| **No Time During Shifts (W)** | **.325** | **.885** | **.537** | **.015** |
| Insufficient Resources at Work (W) | .733 | 1.915 | 1.185 | .490 |
| **Work Location Hard to Access (W)** | **.333** | **.711** | **.487** | **.000** |
| Highest Degree: BS Pharm. | Reference Copy | | | |
| Highest Degree: Pharm. D. | .138 | 1.418 | .442 | .170 |
| Highest Degree: Residency | .110 | 8.505 | .969 | .977 |
| Highest Degree: Fellowship | - | - | - | - |
| Highest Degree: Other | .010 | 4.665 | .218 | .330 |
| Years Work Experience | .896 | 1.103 | .994 | .916 |
| Employment: Academia | .474 | 92.067 | 6.606 | .160 |
| Employment: Hospital | .124 | 1.016 | .355 | .053 |
| Employment: Outpatient | 181 | 2.933 | .728 | .655 |
| Employment: Chain Retail | .255 | 1.606 | .640 | .342 |
| Employment: Independent Retail | .326 | 2.353 | .876 | .554 |
| Employment: Community Health Center | .065 | 4.342 | .530 | .792 |
| Employment: Mail Order | .033 | 3.041 | .319 | .321 |

| | | | | |
|---|---|---|---|---|
| Employment: Retired | .013 | 7.773 | .312 | .478 |
| Employment: Managed Care | .026 | 22.546 | .766 | .877 |
| Employment: Long Term Care | .079 | 3.914 | .555 | .555 |
| Employment: Infusion | .036 | 15.503 | .749 | .851 |
| Age | .849 | 1.043 | .941 | .245 |
| Gender (male reference) | .487 | 2.660 | 1.138 | .765 |
| Race: Caucasian | Reference Category | | | |
| Race: African American | .000 | | .000 | .999 |
| Race: Asian | .000 | | .000 | .999 |
| Race: Hispanic | .000 | | .000 | .999 |
| Race: Two or More Races | .000 | | .000 | .999 |
| Constant | | | $7.425e^{35}$ | 1.000 |

- Dependent variable response "yes"=0 for model; n= 216; Employment reference= not working at location were all set as reference categories
- (P)= Personal Barrier; (V)= Volunteering Barrier; (W)= Work Place Barrier

# Chapter 5

# Discussion

The results of the analysis will be elaborated on in the following section. Important trends and similarities to published literature will be discussed as well as factors that may have limited the accuracy of the study. Areas of future research that could be worthwhile pursuing will also be recommended. Final concluding statements are written lastly to summarize the findings of this study.

## 5.1   Discussion of Results

There is room for growth within the pharmacist work force in regards to involvement with the provision of non-dispensing services to underserved populations. Only 43% of pharmacists are currently involved with the provision of non-dispensing services to underserved populations. The majority of pharmacists seem willing, capable, or both willing and capable to provide non-dispensing services to underserved

populations. This would indicate that the pharmacist work force might welcome a larger role in this initiative and there is a large pool of pharmacists to approach.

It is safe to assume that personal factors are the least influential barriers to pharmacists' involvement with the provision of non-dispensing services to underserved populations. Responses indicated that the majority of pharmacists are willing, capable, or both willing and capable to assist a variety of patients with a number of different services for a variety of disease states. Pharmacists further supported this fact by disagreeing most with personal barrier questions regardless of current involvement with underserved populations. This does not necessarily mean that an organization will have success recruiting pharmacists to assist with every initiative. Pharmacists do appear to have a comfort zone in regards to patients they assist and the services they provide.

Specific disease areas, diabetes, cardiovascular disease, and hyperlipidemia were consistently the areas pharmacists were assisting and most willing and capable to be involved with. These disease states are areas where pharmacists have had their most noteworthy successes in regards to MTM programs.[82-86] Pharmacists were willing to assist with a number of other disease states listed, but more pharmacists identified themselves as currently assisting in these areas as well as willing and capable. Based on human agency theory, organizations may have more success recruiting pharmacists to assist with patients with these diseases compared to others because more pharmacists may be able to envision themselves working in this area and feel they can meet the expectations of that role.

Responses identified pharmacists as more willing and comfortable in educational or counseling roles. The top five non-dispensing services that pharmacists identified as

both willing and capable to perform in order from highest to lowest were drug education, comprehensive medication review, adherence education, lifestyle modification counseling, and disease education (Fig. 4.8 and 4.12). Closely outside of the top 5 by 1% was the non-dispensing service of providing a personal medication record. These services all center around counseling the patient on a certain aspect of their therapy or illness. These roles do not require a large amount of involvement in the management of the patients' therapy.

Barner 2001 found similar outcomes when surveying pharmacists in a CHC or FMC environments regarding their frequency, perceived importance, and preparedness for non-dispensing skills. The groups of skills receiving the highest rating for these areas were collecting, organizing, and evaluating information and providing medication and patient counseling.[65] The description of the individual items in this survey match the top five non-dispensing services provided by pharmacists and services most willing and capable to provide (Fig. 4.8 and 4.12). Pharmacists surveyed recently did show more interest in providing services and counseling beyond those that solely focused on medication where as Barner 2001 indicated that pharmacist data collection, evaluation, and counseling primarily focused on the patient's medications.[65] Pharmacist provision of life-style modification counseling and disease state education were in the top five services provided and services pharmacists most willing and capable to provide. This result may indicate an evolution in pharmacist focus from primarily medication in 2001 to holistic treatment of the patient in present day.

The non-dispensing services that required pharmacists to take a larger role in health care of the patient were not as frequently identified by pharmacists as areas they

were assisting in or as capable to provide. This was also similar to Barner 2001. Currently, only 4% of pharmacists are involved in an MTM program to assist underserved populations. Their perceptions of their capabilities to participate in an MTM program were also low in comparison to other non-dispensing services. Providing patients with a medication action plan was low as well. These specific services require pharmacists to assist in the management of a patients' medication therapy. MTM programs are very comprehensive requiring pharmacists to assess clinical markers, evaluate the success of a patients' current drug regimen, and make recommendations to the patients and other health professionals in the form of a medication action plan (MAP). For the time being, pharmacists might be more willing to assist in an education or counseling role instead of a role that requires as much management of a patient's therapy.

It is interesting that more pharmacists were not willing and capable to participate in MTM programs. Of the twelve non-dispensing services incorporated in the survey, nine of the services are components of an MTM program. Most of the components received high percentages of pharmacists indicating they were willing and/or capable (Fig. 4.8 and 4.12). It is expected that pharmacists may have preferences regarding components of MTM programs they like versus dislike. Based on the result, pharmacists appear to be less willing and confident to make recommendations to patients or physicians regarding therapy. It was surprising that MTM program as an item that encompasses both liked and disliked skills would be receive 10% fewer pharmacists that were capable below the lowest scored component. It was originally expected that this category would fall somewhere in the middle of all the components.

Pharmacists were not given names of the MTM components on the survey. Instead they were provided a summarized description based on the information provided in the MTM Core Concepts version 2.0. It is possible that pharmacists were not aware of how the non-dispensing services listed on the survey fit together into a larger program. The MTM program description listed on the survey was "enroll patients into a program where patient and pharmacist routinely meet (every 3 to 6 months) to evaluate a patient's health status and drug therapy management in order to improve clinical results". The description may have been intimidating to pharmacists taking the survey. Only approximately 4% of pharmacists are currently participating in an MTM program in the sample. The remaining pharmacists might not fully understand the abilities they have and how those abilities can be utilized to implement an MTM program.

The same phenomenon seemed to occur for the non-dispensing services of MAP. The MAP component in an MTM program is designed to establish goals for patient's therapy and interventions for the pharmacist to assist the patient in achieving those goals. In regards to conducting interventions, the non-dispensing services that had the most willing and capable pharmacists were the most frequently occurring pharmacist interventions in the literature (Fig. 4.12). [29] Pharmacists surveyed appear to be able to conduct the necessary steps to counsel or educate patients regarding their therapy. In regards to goal setting and measurement, 50% of pharmacists indicate they were capable to work with patients with a variety of disease states (Fig. 4.13). It could be assumed that pharmacists that consider themselves capable with a disease state would understand important clinical guidelines, the medication therapy, and important information to educate their patient on. There were a large number of pharmacists that appear to have

the necessary skills and abilities to provide patients with a MAP yet very few identified themselves as capable.

This data does indicate that pharmacists could participate in a MTM program. Pharmacists seem to feel they are not capable however. More success may be had incorporating pharmacists in an existing program versus asking them to start a program. The concept of a MTM program could be very intimidating for pharmacists even though they may have the capability to execute most if not all the components of the program.

Another service that received a lower frequency of pharmacists identifying themselves as willing and capable was vaccination. The low response to this service was surprising do to the recent rapid growth in this service. Currently, 150,000 pharmacists in the US are certified to administer vaccinations.[87] All 50 states have approved pharmacists as providers of influenza vaccines and pharmacies were responsible for 20% of influenza vaccinations 2010-11.[88,89] Additionally, 40 states allow pharmacists to provide any vaccination. While Ohio is one of the 10 states that has restrictions, pharmacists in Ohio can still provide influenza, zoster, td/tdap, pneumococcal, and HPV vaccinations.[90]

Regardless of the growth in this service, overall pharmacists are still very apprehensive about providing it to underserved populations. The growth in vaccination might have been confined to certain work settings. Chain retail pharmacists were significantly different from the rest of the sample with more pharmacists that were willing and capable to provide vaccinations to underserved populations. Hospital pharmacists were also significantly different, but their difference was caused by a greater number of pharmacists that responded as confident only. Pharmacists employed in an independent setting were not significantly different from the rest of the sample. While

vaccination is new, it may have not been adapted by all work settings at the same place creating a difference in pharmacists' willingness and capabilities based on their practice experience. Currently, results from this study indicate that recruiting pharmacists for immunizations may not be as successful as programs requesting pharmacists to provide education or counseling services. If this service is needed, chain retail pharmacists may be the best group to approach.

Patient characteristics had a larger range of frequencies. Medically complex patients and patients of a different race from the pharmacists consistently were identified by pharmacists as willing and capable to assist as well as currently assisting. The percentage of pharmacists responding to the other characteristics changed based on categories of assisting, willingness, or capabilities. Characteristics of non-English speaking, HIV, and psychosocial problems received the lowest frequency of pharmacists responding that thought they were capable to assist by a large amount compared to other characteristics. While pharmacists were generally willing their capabilities were much lower for certain populations. It might be important for program coordinators to clearly define the population pharmacists will be working with. Income/insurance status was the one area that appeared to have no influence on pharmacists' perceptions of their willingness and capabilities. Even though the homeless populations appeared to receive less attention than the other categories pharmacists' perceptions of willingness and capabilities were very close across all categories. More research will need to be conducted regarding reasons for pharmacists' low perceptions of capabilities and how those deficits can be addressed to increase the providers who can assist the lower populations.

Relationships between pharmacists' work experience and their willingness and capabilities were shown in our analysis. The largest trend indicated that pharmacists that have graduate in the last 1-8 years with a Pharm. D. degree were more likely to be willing and capable to assist with patient characteristics, non-dispensing services, and disease states. The categories that were significantly different weren't in categories that large percentages of pharmacists indicated as willing and/or capable. Categories where very few pharmacists indicated that they were willing and/or capable saw significant differences based on highest degree achieved and years work experience. Especially in the case of HIV, Hepatitis C, or illicit drug users, recently graduated pharmacists with Pharm. D. degrees were more willing and capable to assist and had few pharmacists that responded they were neither willing nor capable or declined to answer. These finding suggest that as a whole, the pharmacy work force is similar in their willingness and capabilities. In the event of a disease pharmacists do not normally interact with or a group of patients that might be more difficult to assist recently graduated Pharm. D. pharmacists will be slightly more willing and capable to assist than other demographics of pharmacists.

Of the pharmacists with Pharm. D. degrees, 66% have graduated in the last 8 years. Most if not all of the pharmacists in this group graduated after the American Association of College of Pharmacies implemented a curriculum that had a terminal Pharm. D. degree and phased out the five year B.S. Pharm degree. The majority of remaining pharmacist with Pharm. D. degrees had nine to sixteen years of experience. As years of experience increase fewer pharmacists have Pharm. D. degrees. Data indicates that recently graduate pharmacists have received some experience, training, or education

that would make them feel more willing and capable to work with patient populations than pharmacists with B.S. Pharm degrees and more work experience. The academic curriculum seems to be the most plausible explanation for the difference.

New graduates have not shown to be more willing and capable above and beyond other pharmacists in the work force for every non-dispensing service, patient characteristic, and disease state (Table 4.5). The knowledge and experiences recently graduated pharmacists possess seem to provide them with a broader base leading to more willingness and capabilities to address difficult non-dispensing services or more obscure disease states like HIV compared to other pharmacist groups. Currently, overall pharmacist willingness and capabilities in the areas that recently graduated pharmacists are significantly different are still low. Specific college courses, rotation sites, or general experiences which lead to increased willingness and capabilities should be identified and enhanced in the curriculum to prepare more pharmacists to enter the work force ready to assist underserved populations. The study of pharmaceutical services in community health centers indicated that most licensed pharmacies that provide advanced pharmaceutical services in community health centers were linked to teaching institutions. Whether these sites are effective in increasing pharmacists' willingness and capabilities is still undetermined in current literature. Further research in this area may enhance college of pharmacy curriculums, preparedness of students, and underserved populations' access to health services.

Over 80% of pharmacists provide non-dispensing services to underserved patients at their place of work. As a result, Model 2 might be a better representation of barriers pharmacists are currently experiencing. Regression Model 2 identified significant

environmental barriers in the work place revolving around the location of the pharmacy and pharmacist availability during shifts. These barriers may be extremely hard for an individual pharmacist to overcome in order to assist with underserved populations because many of these factors are out of their locus of control. The majority of pharmacists identified working in metropolitan and suburban settings where underserved populations do not generally reside. Also, many pharmacists do not have control of scheduling and staffing at their pharmacies. Staffing is a large overhead cost to any business. Employer may be hesitant to add additional staff for a cause that is not profit oriented.

The third significant barrier in predicting pharmacists' current involvement with underserved populations in the work place was their employer had not been approached to assist. Even if more employers were approached it may not increase the number of services available to underserved populations because of the prior barriers. The predominant barrier of location still would remain an issue as well as pharmacists time during shifts. Current, MTM programs have identified lack of compensation as a major barrier to providing these services.[47] Programs for underserved populations if compensated usually compensate below market average. If staffing is already over worked more pharmacists may need to be hired, which costs additional resources.

Work location does seem to influence whether pharmacists are willing and/or capable to provide non-dispensing services. Independent pharmacies might be more receptive to providing a new service. In general, independent pharmacies have shown in the past to be more active in seeking out new services to provide.[91] Pharmacists that work in the independent pharmacy setting showed to be significantly more willing and capable

to work with different patient populations, provide non-dispensing services, and working

with different disease states (Table 4.6). Unfortunately, independent pharmacies are

smaller businesses with limited resources in comparison to other types of pharmacies.

Asking independent pharmacies to implement a larger share of programs could lead to a

significant burden if they are uncompensated for their efforts. However, pharmacists at

these locations might be more willing and confident to become involved in a volunteer

initiative to provide health services to underserved populations.

Attracting pharmacists to a volunteering role might be the easier path to include

pharmacists in providing health care services to underserved populations. It appears that

most pharmacists are dependent on their work place to assist underserved patients due to

the 83% of pharmacists that reported providing non-dispensing services there versus

community health centers (12%) and free medical clinics (13%). Unfortunately, only 216

pharmacists (59.5%) in the sample identified being able to provide non-dispensing

services in their place of work. More pharmacists might be able to become involved in

this effort if they actively searched for opportunities to assist outside of their place of

work.

The crux of the barriers pharmacists encounter with volunteering seems to be a

lack of communication between them and coordinators for underserved population health

programs. Of the top barriers most agreed upon for both assisting and not assisting

groups of pharmacists were hesitant to volunteer before understanding commitment,

never been approached to provide non-dispensing barriers to underserved populations,

and being unaware of where to volunteer in this initiative. More pharmacists may become

involved if educated on the types of organizations in the community, the available roles

these organizations need health care providers for, and the type of commitment they are looking from volunteers. Based on the overwhelming agreement with volunteering barriers, approaching pharmacists to assist with community initiatives appears to be the best method of increasing their involvement with this initiative.

A barrier that may begin to arise after communication with community organizations is established is pharmacists' free time. The research on volunteering for physicians indicated that availability was their biggest barrier to becoming more involved in their community.[79] The pharmacists did not agree as much with the barriers associated with personal time as was expected. Based on the information collected, pharmacists indicated they slightly disagreed that they were not involved with other initiatives in the community and they did not have enough time to volunteer. Pharmacists appear to have similar career demands as physicians. It is possible that due to the multitude of other barriers pharmacists are currently facing the demands on their schedule are being over looked. It will be interesting to see how the impact of these barriers changes over time.

One main conflict in the results of this study was the significance of pharmacists' level of interest in predicting involvement with non-dispensing services to underserved populations. Regression Model 1 and 2 consistently identified pharmacists' lack of interest in providing non-dispensing services to underserved populations as a predictor of current involvement with underserved populations. These models suggest that the odds may be higher encountering pharmacists who aren't interested in this aspect of pharmacy practice in a population of pharmacists that are not currently working with underserved patients. This result indicates that there is a significantly larger group of uninterested pharmacists not providing services to underserved populations than pharmacists currently

assisting. This difference would be expected. Based on the mean ratings for that item displayed in Table 4, it appears that the uninterested group is a small portion of the pharmacists.

## 5.2 Limitations

The survey was only conducted of pharmacists practicing in the State of Ohio. These results may not be applicable to other states or the United States as a whole. It is also important to note that individual states regulate the non-dispensing services provided by pharmacists and the regulations vary state to state. Pharmacists may be more or less involved with MTM based on the state they practice in.

The success of the survey relied on how pharmacists responded to the items asked of them. Most items in the survey are simple to understand and respond to. One potential problem is the items that ask pharmacists to assess their capabilities. The intent of the question is for pharmacists to respond based on a reflection limited to them personally. Respondents may have based their response on other factors in their environment, such as their work place. For example, a respondent may feel they are capable to educate patients on their disease. However, he/she did not have the time during his/her shift at work to provide non-dispensing services. As a result, the pharmacist does not indicate he/she is capable when in actuality his/her self-reflection indicated he/she was capable. For pharmacists who responded in this manner may have lead to reporting lower percentage of capabilities in the final analysis.

The items were worded "If presented the opportunity…" with the intent to illicit a reflection of self when answering the survey items for capabilities. Only one pharmacist

panel member indicated that this might be a potential issue for survey participants. When the remaining panel members were asked for their interpretation of the items they all responded in concordance with the intent of the researchers. Based on the input from the remaining panel members, it was determined that the wording was sufficient for the intent of the study.

It is important to state that the patient characteristics and barriers for this study were found in literature of other health professions and from recommendations from a panel of pharmacists. While significant barriers were identified in this study, there might be an important barrier specific to pharmacists, which was not included in the survey. Therefore, pharmacists could be less inclined to assist based on additional factors unaddressed. Lastly, do to pharmacists response to survey the recommended sample size was not reached. Therefore, the margin of error was slightly larger than normal at 5.05%.

## 5.3 Future Areas of Study

The Social Cognitive Theory indicates that individuals that perceive themselves as both willing and capable are more likely to fulfill an intended behavior. A large number of pharmacists in this study responded as either willing or capable to a number of services. While the assumption could be made that these individuals have a higher likelihood of providing non-dispensing services it is uncertain if these individuals would pursue that opportunity if presented with it. More research should be conducted in the area of identifying factors that would make these pharmacists more likely become involved. For example, what type of experiences or training would a pharmacist who is "willing" need in order to feel capable as well?

Trying to determine the environment or experiences that best prepare pharmacists to assist underserved patients could be crucial to developing a work force of pharmacists interested in participating in this initiative. The fact that more recent graduates identified themselves as willing and capable might be a promising starting point for this initiative. Pharmacy students are exposed to five years of course work before one year of rotations in a variety of work settings. Analyzing course work, school experiences, and the different rotation sites students participated in could be helpful in identifying developmental processes that lead to increase perceptions of willingness and capabilities for providing non-dispensing services to underserved populations.

In regards to barriers, the results of this study indicated that pharmacists were relatively unaware of how to get involved or what is expected of them if they were to get involved. More research may be valuable in regards to effective ways of linking pharmacists to programs in their community that could benefit from the services they can provide. The non-dispensing role of pharmacists has had its most growth since the passing of the Medication Modernization Act in 2003. It is possible that health care coordinators for underserved populations do not understand the types of services a pharmacist can contribute or how to utilize pharmacists in their program. Surveying coordinators of health programs for underserved patients may prove valuable in identifying areas of education pharmacist need to provide to colleagues in health care regarding their abilities and strengths as a member of the health care team.

An overwhelming number of pharmacists identified their place of employment as the setting where they provide non-dispensing services to underserved populations. A significant barrier identified by regression model 2 was pharmacists' employer had not

been approached concerning assisting underserved populations. Employers could be surveyed to identify their interest in being involved with this initiative, the services they could provide, and barriers they might encounter when trying to provide non-dispensing services. This research may provide a better understanding concerning the feasibility of maintaining pharmacists' place of work as the predominant setting for assisting underserved populations or if other venues are needed to grow pharmacists' role in this initiative.

Lastly, underserved populations perceptions of pharmacists should be assessed. Pharmacists are relatively new in their role as a non-physician clinician. Research should be conducted regarding underserved perceptions of pharmacists to ensure that they are receptive to pharmacists in that role.

## 5.4 Conclusions

A little over 40% of pharmacists are involved in the provision of non-dispensing services primarily in the place of work. In general, the majority of pharmacists are either willing, capable, or both willing and capable to provide non-dispensing services to patients with a variety of characteristics and disease states. Regardless of pharmacists' current status providing or not providing non-dispensing services to underserved patients they seem to encounter the same barriers. Personal barriers were indicated as the barriers least responsible for not assisting underserved populations. Work place barriers of being in a location that is hard for underserved populations to access, lack of available time during pharmacists shifts, and employers not being approached by organizations were identified as the most significant predictors of pharmacist involvement with underserved

populations. Volunteering could be the best method to involve more pharmacists in the future, however, pharmacists reported never being approach by organizations to assist, being unaware of how to get involved, and being hesitant to volunteer prior to understanding the commitment. More interaction between pharmacists and program coordinators for underserved populations may be a remedy for these barriers.

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# Appendix A

**Pharmacists Involvement, Willingness, and Capabilities: Raw Data Tables**

**Table A.1: Raw Data Tables for Pharmacists' Willingness, Capabilities, and Involvement for Patient Characteristics**

| Patient Income | N | W | C | A | WC | WA | CA | WCA | Ne | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Homeless | 363 | 111 | 63 | 23 | 106 | 4 | 0 | 21 | 5 | 29 |
| Medicaid/Safety Net | 363 | 93 | 54 | 39 | 96 | 5 | 5 | 53 | | 17 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Uninsured | 363 | 99 | 47 | 41 | 103 | 4 | 3 | 55 | 0 | 10 |
| Low Income | 363 | 96 | 33 | 45 | 109 | 5 | 12 | 57 | | 6 |
| <u>Patient Characteristics</u> | | | | | | | | | | |
| Illicit Drug User | 363 | 91 | 70 | 13 | 61 | 3 | 0 | 25 | 13 | 86 |
| HIV | 363 | 170 | 33 | 23 | 50 | 4 | 1 | 16 | 7 | 58 |
| Non-English Speaking | 363 | 160 | 23 | 28 | 24 | 7 | 0 | 21 | 24 | 75 |
| Criminal Record | 363 | 106 | 67 | 25 | 77 | 4 | 1 | 31 | 7 | 45 |
| Psychosocial Problems | 363 | 127 | 40 | 36 | 57 | 8 | 1 | 34 | 13 | 47 |
| Different Race | 363 | 121 | 41 | 32 | 98 | 7 | 3 | 48 | 4 | 9 |
| Medically Complex | 363 | 112 | 43 | 44 | 83 | 7 | 2 | 48 | 1 | 21 |

-N= sample size; W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond


## Table A.2: Raw Data Tables for Pharmacists' Willingness, Capabilities, and Involvement for Non-Dispensing Services

| <u>Non-Dispensing Services</u> | <u>N</u> | <u>W</u> | <u>C</u> | <u>A</u> | <u>WC</u> | <u>WA</u> | <u>CA</u> | <u>WCA</u> | <u>Ne</u> | <u>D</u> |
|---|---|---|---|---|---|---|---|---|---|---|
| MTM program | 363 | 137 | 59 | 10 | 106 | 0 | 1 | 6 | 6 | 38 |
| Health Screening | 363 | 135 | 54 | 22 | 87 | 2 | 0 | 16 | 7 | 38 |
| PAP | 363 | 116 | 57 | 20 | 105 | 4 | 1 | 26 | 7 | 27 |
| MAP | 363 | 116 | 55 | 22 | 115 | 4 | 3 | 24 | 1 | 23 |
| Vaccine | 363 | 104 | 41 | 31 | 72 | 3 | 0 | 26 | 17 | 69 |
| PMR | 363 | 100 | 54 | 29 | 121 | 5 | 1 | 37 | 2 | 13 |
| Physician | 363 | 100 | 62 | 31 | 101 | 5 | 1 | 43 | 1 | 19 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Recommendation | | | | | | | | | |
| Disease Ed | 363 | 99 | 49 | 37 | 115 | 3 | 0 | 47 | 0 | 13 |
| Life Modification Counseling | 363 | 99 | 47 | 41 | 114 | 3 | 0 | 50 | 1 | 8 |
| Adherence Ed | 363 | 94 | 42 | 42 | 126 | 4 | 0 | 50 | 1 | 1 |
| CMR | 363 | 89 | 49 | 39 | 119 | 5 | 2 | 50 | 2 | 7 |
| Drug Ed | 363 | 83 | 40 | 50 | 118 | 8 | 0 | 63 | 0 | 1 |

-N= sample size; W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table A.3: Raw Data Tables for Pharmacists' Willingness, Capabilities, and Involvement for Patient Disease States**

| Disease States | N | W | C | A | WC | WA | CA | WCA | Ne | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Hepatitis C | 363 | 183 | 47 | 2 | 36 | 1 | 0 | 11 | 17 | 66 |
| HIV/AIDS | 363 | 170 | 49 | 9 | 40 | 2 | 0 | 12 | 16 | 65 |
| Alzheimer | 363 | 161 | 43 | 16 | 71 | 1 | 0 | 23 | 11 | 37 |
| Chronic Kidney Disease | 363 | 144 | 51 | 16 | 76 | 2 | 0 | 22 | 11 | 41 |
| Parkinsons | 363 | 162 | 48 | 16 | 67 | 3 | 0 | 21 | 11 | 35 |
| Thyroidism | 363 | 132 | 46 | 22 | 92 | 2 | | 26 | 14 | 29 |
| COPD | 363 | 129 | 41 | 25 | 102 | 4 | 0 | 28 | 8 | 26 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Depression | 363 | 125 | 48 | 21 | 102 | 5 | 0 | 31 | 6 | 25 |
| pain management | 363 | 125 | 46 | 26 | 97 | 3 | 1 | 33 | 9 | 23 |
| Asthma | 363 | 126 | 44 | 27 | 102 | 4 | 0 | 33 | 5 | 22 |
| Anticoagulation | 363 | 126 | 41 | 27 | 89 | 3 | 1 | 34 | 7 | 35 |
| Osteoporosis | 363 | 123 | 44 | 26 | 104 | 5 | | 35 | 9 | 17 |
| Dyslipidemia | 363 | 114 | 42 | 29 | 110 | 4 | 1 | 34 | 5 | 24 |
| Cardiovascular | 363 | 112 | 39 | 34 | 105 | 3 | 1 | 44 | 4 | 21 |
| Diabetes | 363 | 111 | 36 | 38 | 98 | 5 | 1 | 44 | 5 | 25 |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

# Appendix B

## Pharmacists Willingness and Capabilities by Work Place Factors

**Table B.1: Differences in Pharmacists' Willingness and Capabilities Regarding Patient Characteristics by Highest Degree Achieved**

| Low Income | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
|---|---|---|---|---|---|---|---|
| B.S. Pharm. | 34 | 65 | 23 | 88 | 3 | 213 | 0.153 |
| Pharm. D. | 9 | 22 | 11 | 58 | 3 | 103 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Residency | 7 | 5 | 2 | 9 | 0 | 23 | |
| Fellowship | 0 | 3 | 0 | 1 | 0 | 4 | |
| Other | 0 | 4 | 2 | 5 | 0 | 11 | |
| Total | 50 | 99 | 38 | 161 | 6 | 354 | |
| **Medicare/SN** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 27 | 65 | 35 | 76 | 10 | 213 | |
| Pharm. D. | 8 | 18 | 17 | 54 | 6 | 103 | |
| Residency | 4 | 7 | 3 | 9 | 0 | 23 | 0.217 |
| Fellowship | 0 | 3 | 0 | 1 | 0 | 4 | |
| Other | 0 | 4 | 2 | 4 | 1 | 11 | |
| Total | 39 | 57 | 57 | 144 | 17 | 354 | |
| **Uninsured** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 29 | 65 | 29 | 83 | 6 | 212 | |
| Pharm. D. | 8 | 24 | 12 | 55 | 4 | 103 | |
| Residency | 3 | 7 | 4 | 9 | 0 | 23 | 0.538 |
| Fellowship | 0 | 3 | 0 | 1 | 0 | 4 | |
| Other | 0 | 4 | 2 | 5 | 0 | 11 | |
| Total | 40 | 103 | 47 | 153 | 10 | 353 | |
| **Homeless** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 16 | 72 | 36 | 68 | 20 | 212 | |
| Pharm. D. | 6 | 28 | 19 | 41 | 9 | 103 | |
| Residency | 3 | 7 | 4 | 9 | 0 | 23 | 0.729 |
| Fellowship | 0 | 3 | 0 | 1 | 0 | 4 | |
| Other | 0 | 4 | 3 | 4 | 0 | 11 | |
| Total | 25 | 114 | 62 | 123 | 29 | 353 | |
| **Medically Complex** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 31 | 79 | 29 | 60 | 14 | 213 | |
| Pharm. D. | 9 | 27 | 10 | 53 | 4 | 103 | |
| Residency | 5 | 5 | 3 | 10 | 0 | 23 | 0.032 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 6 | 1 | 3 | 1 | 11 | |
| Total | 45 | 118 | 44 | 127 | 20 | 354 | |
| **HIV/AIDS** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 20 | 94 | 20 | 34 | 44 | 212 | |
| Pharm. D. | 8 | 57 | 7 | 22 | 9 | 103 | |
| Residency | 0 | 11 | 5 | 5 | 2 | 23 | 0.231 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 7 | 1 | 2 | 1 | 11 | |
| Total | 28 | 171 | 33 | 64 | 57 | 353 | |
| **Psychosocial disorders** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 32 | 81 | 23 | 46 | 31 | 213 | 0.544 |
| Pharm. D. | 13 | 40 | 10 | 31 | 9 | 103 | |
| Residency | 1 | 8 | 4 | 6 | 4 | 23 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fellowship | 1 | 2 | 0 | 0 | 1 | 4 | |
| Other | 0 | 3 | 3 | 4 | 1 | 11 | |
| Total | 47 | 134 | 40 | 87 | 46 | 354 | |
| **Different Race** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 24 | 83 | 28 | 72 | 6 | 213 | |
| Pharm. D. | 8 | 31 | 11 | 50 | 3 | 103 | |
| Residency | 2 | 6 | 3 | 12 | 0 | 23 | 0.738 |
| Fellowship | 0 | 2 | 0 | 2 | 0 | 4 | |
| Other | 0 | 5 | 1 | 5 | 0 | 11 | |
| Total | 34 | 127 | 43 | 141 | 9 | 254 | |
| **Non-English Speaking** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 32 | 91 | 15 | 19 | 55 | 212 | |
| Pharm. D. | 15 | 52 | 7 | 17 | 12 | 103 | |
| Residency | 3 | 12 | 0 | 4 | 4 | 23 | 0.290 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 7 | 1 | 2 | 1 | 11 | |
| Total | 50 | 164 | 23 | 43 | 73 | 353 | |
| **Criminal Record** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 22 | 70 | 34 | 53 | 34 | 213 | |
| Pharm. D. | 9 | 26 | 22 | 39 | 7 | 103 | |
| Residency | 0 | 8 | 6 | 8 | 1 | 23 | 0.212 |
| Fellowship | 0 | 0 | 1 | 2 | 1 | 4 | |
| Other | 0 | 4 | 2 | 4 | 1 | 11 | |
| Total | 31 | 108 | 65 | 106 | 44 | 354 | |
| **Illicit Drug User** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 36 | 59 | 23 | 95 | 0 | 213 | |
| Pharm. D. | 10 | 18 | 12 | 62 | 1 | 103 | |
| Residency | 3 | 6 | 2 | 12 | 0 | 23 | 0.431 |
| Fellowship | 0 | 2 | 0 | 2 | 0 | 4 | |
| Other | 0 | 4 | 2 | 5 | 0 | 11 | |
| Total | 49 | 89 | 39 | 176 | 1 | 354 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.2: Differences in Pharmacists' Willingness and Capabilities Regarding Non-Dispensing Services by Highest Degree Achieved**

| Drug Education | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
|---|---|---|---|---|---|---|---|
| B.S. Pharm. | 36 | 59 | 23 | 95 | 0 | 213 | |
| Pharm. D. | 10 | 18 | 12 | 62 | 1 | 103 | |
| Residency | 3 | 6 | 2 | 12 | 0 | 23 | 0.431 |
| Fellowship | 0 | 2 | 0 | 2 | 0 | 4 | |
| Other | 0 | 4 | 2 | 5 | 0 | 11 | |
| Total | 49 | 89 | 39 | 176 | 1 | 354 | |
| **Adherence Counseling** | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 31 | 62 | 25 | 94 | 1 | 213 | |
| Pharm. D. | 6 | 23 | 11 | 63 | 0 | 103 | |
| Residency | 4 | 6 | 2 | 11 | 0 | 23 | 0.465 |
| Fellowship | 0 | 2 | 1 | 1 | 0 | 4 | |
| Other | 0 | 4 | 2 | 5 | 0 | 11 | |
| Total | 41 | 97 | 41 | 174 | 1 | 354 | |
| **Disease Education** | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 24 | 68 | 32 | 82 | 7 | 213 | |
| Pharm. D. | 7 | 21 | 12 | 60 | 3 | 103 | |
| Residency | 4 | 5 | 2 | 12 | 0 | 23 | 0.063 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 5 | 2 | 4 | 0 | 11 | |
| Total | 35 | 101 | 48 | 159 | 11 | 354 | |
| **Life Style Modification** | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 29 | 67 | 26 | 85 | 6 | 213 | |
| Pharm. D. | 8 | 22 | 13 | 58 | 2 | 103 | |
| Residency | 3 | 5 | 3 | 12 | 0 | 23 | 0.446 |
| Fellowship | 0 | 2 | 1 | 1 | 0 | 4 | |
| Other | 0 | 4 | 3 | 4 | 0 | 11 | |
| Total | 40 | 100 | 46 | 160 | 8 | 354 | |
| **Health Screening** | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 17 | 78 | 39 | 49 | 29 | 212 | |
| Pharm. D. | 8 | 39 | 10 | 41 | 5 | 103 | |
| Residency | 2 | 9 | 2 | 9 | 1 | 23 | 0.109 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 6 | 2 | 1 | 1 | 10 | |
| Total | 27 | 134 | 53 | 101 | 37 | 352 | |
| **Vaccination** | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 29 | 56 | 26 | 47 | 55 | 213 | |
| Pharm. D. | 13 | 32 | 11 | 39 | 8 | 103 | |
| Residency | 3 | 8 | 2 | 8 | 2 | 23 | 0.002 |
| Fellowship | 0 | 1 | 0 | 1 | 2 | 4 | |
| Other | 0 | 8 | 2 | 0 | 1 | 11 | |
| Total | 45 | 105 | 41 | 95 | 68 | 354 | |

| CMR | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
|---|---|---|---|---|---|---|---|
| B.S. Pharm. | 27 | 63 | 31 | 87 | 4 | 212 | |
| Pharm. D. | 9 | 19 | 14 | 60 | 1 | 103 | |
| Residency | 4 | 5 | 2 | 12 | 0 | 23 | 0.041 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 4 | 2 | 5 | 0 | 11 | |
| Total | 40 | 92 | 50 | 165 | 6 | 353 | |
| PMR | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 22 | 68 | 34 | 78 | 10 | 212 | |
| Pharm. D. | 6 | 24 | 13 | 59 | 1 | 103 | |
| Residency | 2 | 7 | 3 | 11 | 0 | 23 | 0.103 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 3 | 3 | 5 | 0 | 11 | |
| Total | 30 | 103 | 54 | 154 | 12 | 353 | |
| MAP | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 14 | 74 | 39 | 68 | 18 | 213 | |
| Pharm. D. | 6 | 27 | 14 | 52 | 4 | 103 | |
| Residency | 2 | 7 | 2 | 12 | 0 | 23 | 0.112 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 7 | 1 | 3 | 0 | 11 | |
| Total | 22 | 116 | 57 | 136 | 23 | 354 | |
| MTM Program | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 7 | 85 | 40 | 56 | 25 | 213 | |
| Pharm. D. | 8 | 35 | 11 | 41 | 8 | 103 | |
| Residency | 1 | 7 | 3 | 11 | 1 | 23 | 0.208 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 5 | 3 | 1 | 2 | 11 | |
| Total | 16 | 133 | 58 | 110 | 37 | 354 | |
| Physician Recommendation | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 20 | 69 | 41 | 69 | 14 | 213 | |
| Pharm. D. | 8 | 23 | 14 | 55 | 3 | 103 | |
| Residency | 4 | 6 | 2 | 11 | 0 | 23 | 0.085 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 4 | 3 | 4 | 0 | 11 | |
| Total | 32 | 103 | 61 | 140 | 18 | 354 | |
| PAP | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| B.S. Pharm. | 14 | 71 | 36 | 71 | 21 | 213 | |
| Pharm. D. | 12 | 34 | 12 | 41 | 4 | 103 | |
| Residency | 0 | 6 | 6 | 11 | 0 | 23 | 0.309 |
| Fellowship | 0 | 1 | 1 | 1 | 1 | 4 | |
| Other | 0 | 5 | 2 | 3 | 1 | 11 | |
| Total | 26 | 117 | 57 | 127 | 27 | 354 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.3: Differences in Pharmacists' Willingness and Capabilities Regarding Disease States by Highest Degree Achieved**

| Alzheimer's | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
|---|---|---|---|---|---|---|---|
| B.S. Pharm. | 21 | 98 | 23 | 48 | 23 | 213 | |
| Pharm. D. | 4 | 43 | 12 | 34 | 10 | 103 | |
| Residency | 1 | 10 | 4 | 6 | 2 | 23 | 0.444 |
| Fellowship | 0 | 4 | 0 | 0 | 0 | 4 | |
| Other | 0 | 4 | 3 | 3 | 1 | 11 | |
| Total | 26 | 159 | 42 | 91 | 36 | 354 | |
| **Anticoagulation** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ (P-Value) |
| B.S. Pharm. | 21 | 91 | 23 | 52 | 26 | 213 | |
| Pharm. D. | 6 | 27 | 13 | 53 | 4 | 103 | |
| Residency | 6 | 4 | 3 | 9 | 1 | 23 | 0.000 |
| Fellowship | 0 | 1 | 0 | 1 | 2 | 4 | |
| Other | 0 | 4 | 2 | 4 | 1 | 11 | |
| Total | 33 | 127 | 41 | 119 | 34 | 354 | |
| **Asthma** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ (P-Value) |
| B.S. Pharm. | 26 | 82 | 25 | 63 | 17 | 213 | |
| Pharm. D. | 3 | 31 | 12 | 54 | 3 | 103 | |
| Residency | 2 | 5 | 4 | 11 | 1 | 23 | 0.024 |
| Fellowship | 0 | 3 | 0 | 1 | 0 | 4 | |
| Other | 0 | 6 | 1 | 3 | 1 | 11 | |
| Total | 31 | 127 | 42 | 132 | 22 | 354 | |
| **Cardiovascular** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ (P-Value) |
| B.S. Pharm. | 28 | 76 | 23 | 71 | 15 | 213 | |
| Pharm. D. | 5 | 24 | 12 | 57 | 5 | 103 | |
| Residency | 4 | 5 | 3 | 11 | 0 | 23 | 0.089 |
| Fellowship | 0 | 2 | 0 | 2 | 0 | 4 | |
| Other | 0 | 5 | 1 | 4 | 1 | 11 | |
| Total | 37 | 112 | 39 | 145 | 21 | 354 | |
| **Chronic Kidney Disease** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ (P-Value) |
| B.S. Pharm. | 20 | 88 | 30 | 44 | 31 | 213 | |
| Pharm. D. | 4 | 41 | 13 | 38 | 7 | 103 | |
| Residency | 2 | 8 | 4 | 9 | 0 | 23 | 0.129 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 5 | 3 | 2 | 1 | 11 | |
| Total | 26 | 144 | 50 | 94 | 40 | 354 | |
| **COPD** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ (P-Value) |
| B.S. Pharm. | 25 | 82 | 24 | 62 | 20 | 213 | 0.030 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pharm. D. | 4 | 32 | 11 | 52 | 4 | 103 | |
| Residency | 3 | 7 | 3 | 10 | 0 | 23 | |
| Fellowship | 0 | 3 | 0 | 0 | 1 | 4 | |
| Other | 0 | 6 | 1 | 3 | 1 | 11 | |
| Total | 32 | 130 | 39 | 127 | 26 | 354 | |
| **Depression** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 23 | 81 | 24 | 68 | 17 | 213 | |
| Pharm. D. | 3 | 34 | 13 | 47 | 6 | 103 | |
| Residency | 0 | 8 | 6 | 9 | 0 | 23 | 0.087 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 4 | 3 | 4 | 0 | 11 | |
| Total | 26 | 129 | 46 | 129 | 24 | 354 | |
| **Diabetes** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 31 | 77 | 20 | 69 | 16 | 213 | |
| Pharm. D. | 7 | 26 | 10 | 54 | 6 | 103 | |
| Residency | 4 | 5 | 3 | 10 | 1 | 23 | 0.176 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 4 | 2 | 4 | 1 | 11 | |
| Total | 42 | 114 | 35 | 138 | 25 | 354 | |
| **Dyslipidemia** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 25 | 78 | 24 | 70 | 16 | 213 | |
| Pharm. D. | 5 | 28 | 9 | 55 | 5 | 102 | |
| Residency | 3 | 6 | 4 | 9 | 1 | 23 | 0.174 |
| Fellowship | 0 | 2 | 0 | 2 | 0 | 4 | |
| Other | 0 | 3 | 3 | 4 | 1 | 11 | |
| Total | 33 | 117 | 40 | 140 | 23 | 353 | |
| **Hepatitis C** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 10 | 106 | 24 | 21 | 52 | 213 | |
| Pharm. D. | 5 | 58 | 13 | 18 | 9 | 103 | |
| Residency | 4 | 10 | 4 | 4 | 1 | 23 | 0.017 |
| Fellowship | 0 | 2 | 0 | 0 | 2 | 4 | |
| Other | 0 | 5 | 3 | 2 | 1 | 11 | |
| Total | 19 | 181 | 44 | 45 | 65 | 354 | |
| **HIV** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 15 | 96 | 24 | 26 | 52 | 213 | |
| Pharm. D. | 5 | 55 | 15 | 20 | 8 | 103 | |
| Residency | 4 | 12 | 4 | 2 | 1 | 23 | 0.021 |
| Fellowship | 0 | 2 | 0 | 0 | 2 | 4 | |
| Other | 0 | 5 | 3 | 2 | 1 | 11 | |
| Total | 24 | 170 | 46 | 50 | 64 | 354 | |
| **Osteoporosis** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| B.S. Pharm. | 25 | 80 | 24 | 73 | 11 | 213 | 0.417 |
| Pharm. D. | 4 | 32 | 14 | 49 | 4 | 103 | |
| Residency | 5 | 7 | 3 | 7 | 1 | 23 | |
| Fellowship | 0 | 2 | 0 | 2 | 0 | 4 | |

| | NE | W | C | W & C | D | Total | $X^2$(P-Value) |
|---|---|---|---|---|---|---|---|
| Other | 0 | 5 | 1 | 4 | 1 | 11 | |
| Total | 34 | 126 | 42 | 135 | 17 | 354 | |
| **Pain Management** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| B.S. Pharm. | 27 | 79 | 24 | 70 | 13 | 213 | |
| Pharm. D. | 2 | 34 | 14 | 45 | 8 | 102 | |
| Residency | 4 | 8 | 3 | 7 | 1 | 23 | 0.401 |
| Fellowship | 0 | 2 | 1 | 1 | 0 | 4 | |
| Other | 0 | 4 | 2 | 4 | 1 | 11 | |
| Total | 33 | 127 | 44 | 127 | 23 | 354 | |
| **Parkinson's Disease** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| B.S. Pharm. | 20 | 96 | 24 | 46 | 27 | 213 | |
| Pharm. D. | 4 | 48 | 15 | 31 | 5 | 103 | |
| Residency | 2 | 9 | 5 | 6 | 1 | 23 | 0.391 |
| Fellowship | 0 | 3 | 0 | 0 | 1 | 4 | |
| Other | 0 | 5 | 2 | 3 | 1 | 11 | |
| Total | 26 | 161 | 46 | 86 | 35 | 354 | |
| **Thyroidism** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| B.S. Pharm. | 29 | 82 | 23 | 58 | 21 | 213 | |
| Pharm. D. | 4 | 36 | 14 | 45 | 4 | 103 | |
| Residency | 2 | 7 | 5 | 8 | 1 | 23 | 0.444 |
| Fellowship | 0 | 2 | 0 | 1 | 1 | 4 | |
| Other | 0 | 5 | 2 | 3 | 1 | 11 | |
| Total | 35 | 132 | 44 | 115 | 28 | 354 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.4: Differences in Pharmacists' Willingness and Capabilities Regarding Patient Characteristics by Years Work Experience**

| **Low Income** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
|---|---|---|---|---|---|---|---|
| 1-8 | 12 | 21 | 7 | 45 | 3 | 88 | |
| 9-16 | 9 | 14 | 6 | 26 | 0 | 55 | |
| 17-24 | 8 | 17 | 3 | 26 | 0 | 54 | 0.879 |
| 25-32 | 7 | 19 | 7 | 27 | 1 | 61 | |
| 33-40 | 11 | 20 | 9 | 25 | 2 | 67 | |
| Total | 47 | 91 | 32 | 149 | 6 | 325 | |
| **Medicare/SN** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| 1-8 | 11 | 20 | 11 | 41 | 5 | 88 | 0.592 |
| 9-16 | 7 | 15 | 7 | 25 | 1 | 55 | |
| 17-24 | 6 | 17 | 7 | 23 | 1 | 54 | |
| 25-32 | 7 | 17 | 8 | 26 | 3 | 61 | |
| 33-40 | 6 | 20 | 16 | 19 | 6 | 67 | |

| | NE | W | C | W & C | D | Total | X² (P-Value) |
|---|---|---|---|---|---|---|---|
| Total | 37 | 89 | 49 | 134 | 16 | 325 | |
| **Uninsured** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 11 | 24 | 9 | 40 | 4 | 88 | |
| 9-16 | 5 | 17 | 7 | 26 | 0 | 55 | |
| 17-24 | 6 | 17 | 5 | 26 | 0 | 54 | 0.796 |
| 25-32 | 7 | 19 | 8 | 26 | 1 | 61 | |
| 33-40 | 9 | 19 | 11 | 23 | 4 | 66 | |
| Total | 38 | 96 | 40 | 141 | 9 | 324 | |
| **Homeless** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 10 | 27 | 12 | 31 | 8 | 88 | |
| 9-16 | 3 | 18 | 8 | 23 | 3 | 55 | |
| 17-24 | 3 | 17 | 9 | 22 | 3 | 54 | 0.434 |
| 25-32 | 2 | 22 | 10 | 23 | 4 | 61 | |
| 33-40 | 6 | 21 | 15 | 14 | 10 | 66 | |
| Total | 24 | 105 | 54 | 113 | 28 | 324 | |
| **Medically Complex** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 12 | 27 | 5 | 40 | 4 | 88 | |
| 9-16 | 6 | 15 | 9 | 23 | 2 | 55 | |
| 17-24 | 6 | 24 | 5 | 19 | 0 | 54 | 0.005 |
| 25-32 | 9 | 26 | 8 | 16 | 2 | 61 | |
| 33-40 | 11 | 17 | 12 | 17 | 10 | 67 | |
| Total | 44 | 109 | 39 | 115 | 18 | 325 | |
| **HIV/AIDS** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 8 | 47 | 4 | 20 | 9 | 88 | |
| 9-16 | 5 | 28 | 5 | 10 | 7 | 55 | |
| 17-24 | 3 | 26 | 6 | 13 | 6 | 54 | 0.001 |
| 25-32 | 7 | 33 | 6 | 9 | 6 | 61 | |
| 33-40 | 3 | 20 | 9 | 9 | 25 | 66 | |
| Total | 26 | 154 | 30 | 61 | 53 | 324 | |
| **Pyschosocial Disorder** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 11 | 35 | 5 | 26 | 11 | 88 | |
| 9-16 | 8 | 20 | 7 | 15 | 5 | 55 | |
| 17-24 | 9 | 20 | 7 | 13 | 5 | 54 | 0.819 |
| 25-32 | 9 | 23 | 7 | 15 | 7 | 61 | |
| 33-40 | 8 | 21 | 8 | 15 | 15 | 67 | |
| Total | 45 | 119 | 34 | 84 | 43 | 325 | |
| **Different Race** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 8 | 27 | 6 | 44 | 3 | 88 | 0.287 |
| 9-16 | 7 | 18 | 6 | 23 | 1 | 55 | |
| 17-24 | 5 | 23 | 3 | 23 | 0 | 54 | |
| 25-32 | 8 | 22 | 8 | 23 | 0 | 61 | |
| 33-40 | 5 | 25 | 13 | 21 | 3 | 67 | |

| Total | 33 | 115 | 36 | 134 | 7 | 325 | |
|---|---|---|---|---|---|---|---|
| **Non-English Speaking** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 15 | 39 | 5 | 16 | 13 | 88 | |
| 9-16 | 7 | 26 | 3 | 9 | 10 | 55 | |
| 17-24 | 10 | 27 | 1 | 5 | 11 | 54 | 0.015 |
| 25-32 | 10 | 33 | 3 | 6 | 9 | 61 | |
| 33-40 | 5 | 21 | 8 | 6 | 26 | 66 | |
| Total | 47 | 146 | 20 | 42 | 69 | 324 | |
| **Criminal Record** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 9 | 23 | 17 | 33 | 6 | 88 | |
| 9-16 | 6 | 15 | 6 | 21 | 7 | 55 | |
| 17-24 | 3 | 17 | 14 | 14 | 6 | 54 | 0.347 |
| 25-32 | 8 | 22 | 8 | 16 | 7 | 61 | |
| 33-40 | 4 | 19 | 14 | 17 | 13 | 67 | |
| Total | 30 | 96 | 59 | 101 | 39 | 325 | |
| **Illicit Drug User** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 12 | 23 | 13 | 27 | 13 | 88 | |
| 9-16 | 4 | 13 | 7 | 19 | 12 | 55 | |
| 17-24 | 1 | 19 | 15 | 10 | 9 | 54 | 0.001 |
| 25-32 | 6 | 18 | 10 | 14 | 13 | 61 | |
| 33+ | 3 | 11 | 14 | 9 | 30 | 67 | |
| Total | 26 | 84 | 59 | 79 | 77 | 325 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.5: Differences in Pharmacists' Willingness and Capabilities Regarding Non-Dispensing Services by Years Work Experience**

| **Drug Education** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
|---|---|---|---|---|---|---|---|
| 1-8 | 12 | 19 | 7 | 49 | 1 | 88 | |
| 9-16 | 7 | 15 | 5 | 28 | 0 | 55 | |
| 17-24 | 9 | 13 | 4 | 28 | 0 | 54 | 0.872 |
| 25-32 | 9 | 16 | 7 | 29 | 0 | 61 | |
| 33+ | 11 | 16 | 12 | 28 | 0 | 67 | |
| Total | 48 | 79 | 35 | 162 | 1 | 325 | |
| **Adherence Counseling** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 9 | 22 | 7 | 50 | 0 | 88 | 0.492 |
| 9-16 | 7 | 17 | 5 | 26 | 0 | 55 | |
| 17-24 | 8 | 17 | 3 | 25 | 1 | 54 | |
| 25-32 | 7 | 17 | 8 | 29 | 0 | 61 | |

| | NE | W | C | W & C | D | Total | |
|---|---|---|---|---|---|---|---|
| 33+ | 9 | 15 | 13 | 30 | 0 | 67 | |
| Total | 40 | 88 | 36 | 160 | 1 | 325 | |
| **Disease Education** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 10 | 19 | 7 | 49 | 3 | 88 | |
| 9-16 | 5 | 18 | 7 | 24 | 1 | 55 | |
| 17-24 | 6 | 16 | 5 | 27 | 0 | 54 | 0.120 |
| 25-32 | 5 | 20 | 8 | 27 | 1 | 61 | |
| 33+ | 8 | 18 | 14 | 21 | 6 | 67 | |
| Total | 34 | 91 | 41 | 148 | 11 | 325 | |
| **Life-style Modification** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 9 | 22 | 9 | 46 | 2 | 88 | |
| 9-16 | 6 | 17 | 6 | 26 | 0 | 55 | |
| 17-24 | 7 | 17 | 5 | 25 | 0 | 54 | 0.487 |
| 25-32 | 8 | 18 | 8 | 27 | 0 | 61 | |
| 33+ | 9 | 18 | 12 | 24 | 4 | 67 | |
| Total | 39 | 92 | 40 | 148 | 6 | 325 | |
| **Health Screening** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 8 | 32 | 8 | 34 | 6 | 88 | |
| 9-16 | 3 | 24 | 6 | 13 | 9 | 55 | |
| 17-24 | 3 | 23 | 8 | 13 | 6 | 53 | 0.160 |
| 25-32 | 6 | 22 | 10 | 19 | 4 | 61 | |
| 33+ | 6 | 20 | 16 | 13 | 11 | 66 | |
| Total | 26 | 121 | 48 | 92 | 36 | 323 | |
| **Vaccination** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 13 | 24 | 6 | 34 | 11 | 88 | |
| 9-16 | 8 | 19 | 5 | 10 | 13 | 55 | |
| 17-24 | 6 | 13 | 10 | 13 | 12 | 54 | 0.119 |
| 25-32 | 9 | 19 | 7 | 17 | 9 | 61 | |
| 33+ | 6 | 20 | 7 | 13 | 21 | 67 | |
| Total | 42 | 95 | 35 | 87 | 66 | 325 | |
| **CMR** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 12 | 21 | 6 | 48 | 1 | 88 | |
| 9-16 | 7 | 14 | 6 | 27 | 1 | 55 | |
| 17-24 | 4 | 16 | 10 | 23 | 1 | 54 | 0.764 |
| 25-32 | 6 | 18 | 8 | 28 | 1 | 61 | |
| 33+ | 9 | 17 | 13 | 25 | 2 | 67 | |
| Total | 38 | 86 | 43 | 151 | 6 | 324 | |
| **PMR** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 8 | 24 | 8 | 47 | 1 | 88 | 0.230 |
| 9-16 | 7 | 14 | 8 | 23 | 3 | 55 | |
| 17-24 | 3 | 19 | 8 | 22 | 2 | 54 | |
| 25-32 | 5 | 18 | 11 | 27 | 0 | 61 | |
| 33+ | 6 | 20 | 13 | 21 | 6 | 66 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 29 | 95 | 48 | 140 | 12 | 324 | |
| **MAP** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 7 | 28 | 8 | 41 | 4 | 88 | |
| 9-16 | 5 | 15 | 11 | 20 | 4 | 55 | |
| 17-24 | 0 | 23 | 7 | 23 | 1 | 54 | 0.007 |
| 25-32 | 5 | 19 | 13 | 24 | 0 | 61 | |
| 33+ | 4 | 21 | 13 | 18 | 11 | 67 | |
| Total | 21 | 106 | 52 | 126 | 20 | 325 | |
| **MTM Program** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 6 | 35 | 6 | 31 | 10 | 88 | |
| 9-16 | 3 | 22 | 10 | 18 | 2 | 55 | |
| 17-24 | 1 | 20 | 8 | 21 | 4 | 54 | 0.069 |
| 25-32 | 3 | 18 | 13 | 22 | 5 | 61 | |
| 33+ | 3 | 26 | 14 | 11 | 13 | 67 | |
| Total | 16 | 121 | 51 | 103 | 34 | 325 | |
| **Physician Recommendation** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 10 | 24 | 10 | 41 | 3 | 88 | |
| 9-16 | 5 | 16 | 10 | 21 | 3 | 55 | |
| 17-24 | 5 | 15 | 8 | 25 | 1 | 54 | 0.372 |
| 25-32 | 6 | 18 | 10 | 24 | 3 | 61 | |
| 33+ | 4 | 23 | 15 | 17 | 8 | 67 | |
| Total | 30 | 96 | 53 | 128 | 18 | 325 | |
| **PAP** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 11 | 29 | 9 | 36 | 3 | 88 | |
| 9-16 | 1 | 19 | 11 | 20 | 4 | 55 | |
| 17-24 | 4 | 14 | 7 | 23 | 6 | 54 | 0.497 |
| 25-32 | 4 | 20 | 11 | 21 | 5 | 61 | |
| 33+ | 5 | 23 | 13 | 19 | 7 | 67 | |
| Total | 25 | 105 | 51 | 119 | 25 | 325 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.6: Differences in Pharmacists' Willingness and Capabilities Regarding Disease States by Years Work Experience**

| **Alzheimer's** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
|---|---|---|---|---|---|---|---|
| 1-8 | 3 | 37 | 10 | 31 | 7 | 88 | 0.240 |
| 9-16 | 6 | 26 | 5 | 13 | 5 | 55 | |
| 17-24 | 4 | 27 | 7 | 15 | 1 | 54 | |
| 25-32 | 8 | 26 | 6 | 14 | 7 | 61 | |
| 33+ | 5 | 28 | 6 | 15 | 13 | 67 | |

| Total | 26 | 144 | 34 | 88 | 33 | 325 | |
|---|---|---|---|---|---|---|---|
| **Anticoagulation** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 11 | 22 | 9 | 41 | 5 | 88 | |
| 9-16 | 3 | 20 | 5 | 22 | 5 | 55 | |
| 17-24 | 4 | 21 | 6 | 20 | 3 | 54 | 0.004 |
| 25-32 | 7 | 26 | 9 | 15 | 4 | 61 | |
| 33+ | 6 | 26 | 7 | 12 | 16 | 67 | |
| Total | 31 | 115 | 36 | 110 | 33 | 325 | |
| **Asthma** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 4 | 29 | 9 | 42 | 4 | 88 | |
| 9-16 | 6 | 19 | 6 | 23 | 1 | 55 | |
| 17-24 | 4 | 21 | 4 | 24 | 1 | 54 | 0.019 |
| 25-32 | 8 | 24 | 8 | 17 | 4 | 61 | |
| 33+ | 8 | 23 | 7 | 17 | 12 | 67 | |
| Total | 30 | 116 | 34 | 123 | 22 | 325 | |
| **Cardiovascular** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 7 | 23 | 8 | 45 | 5 | 88 | |
| 9-16 | 8 | 17 | 4 | 25 | 1 | 55 | |
| 17-24 | 6 | 19 | 3 | 25 | 1 | 54 | 0.054 |
| 25-32 | 8 | 21 | 9 | 20 | 3 | 61 | |
| 33+ | 7 | 21 | 8 | 20 | 11 | 67 | |
| Total | 36 | 101 | 32 | 135 | 21 | 325 | |
| **Chronic Kidney Disease** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 4 | 33 | 12 | 34 | 5 | 88 | |
| 9-16 | 4 | 24 | 6 | 16 | 5 | 55 | |
| 17-24 | 5 | 25 | 5 | 17 | 2 | 54 | 0.012 |
| 25-32 | 5 | 25 | 9 | 15 | 7 | 61 | |
| 33+ | 5 | 24 | 10 | 10 | 18 | 67 | |
| Total | 23 | 131 | 42 | 92 | 37 | 325 | |
| **COPD** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 9 | 28 | 7 | 40 | 4 | 88 | |
| 9-16 | 5 | 20 | 5 | 21 | 4 | 55 | |
| 17-24 | 4 | 23 | 6 | 20 | 1 | 54 | 0.303 |
| 25-32 | 6 | 24 | 7 | 19 | 5 | 61 | |
| 33+ | 8 | 24 | 8 | 16 | 11 | 67 | |
| Total | 32 | 119 | 33 | 116 | 25 | 325 | |
| **Depression** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 3 | 29 | 11 | 39 | 6 | 88 | |
| 9-16 | 4 | 21 | 7 | 19 | 4 | 55 | |
| 17-24 | 5 | 23 | 4 | 21 | 1 | 54 | 0.421 |
| 25-32 | 7 | 21 | 9 | 22 | 2 | 61 | |
| 33+ | 7 | 24 | 8 | 19 | 9 | 67 | |
| Total | 26 | 118 | 39 | 120 | 22 | 325 | |
| **Diabetes** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |

| | NE | W | C | W & C | D | Total | X² (P-Value) |
|---|---|---|---|---|---|---|---|
| 1-8 | 10 | 22 | 6 | 43 | 7 | 88 | |
| 9-16 | 8 | 19 | 4 | 20 | 4 | 55 | |
| 17-24 | 5 | 21 | 4 | 23 | 1 | 54 | 0.365 |
| 25-32 | 9 | 23 | 6 | 20 | 3 | 61 | |
| 33+ | 9 | 19 | 8 | 21 | 10 | 67 | |
| Total | 41 | 104 | 28 | 127 | 25 | 325 | |
| **Dyslipidemia** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 7 | 24 | 8 | 43 | 6 | 88 | |
| 9-16 | 6 | 18 | 5 | 24 | 2 | 55 | |
| 17-24 | 6 | 21 | 5 | 21 | 1 | 54 | 0.407 |
| 25-32 | 6 | 22 | 7 | 22 | 3 | 61 | |
| 33+ | 7 | 23 | 8 | 19 | 10 | 67 | |
| Total | 32 | 108 | 33 | 129 | 22 | 325 | |
| **Hepatitis C** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 5 | 47 | 10 | 17 | 9 | 88 | |
| 9-16 | 2 | 32 | 5 | 6 | 10 | 55 | |
| 17-24 | 3 | 33 | 7 | 5 | 6 | 54 | 0.012 |
| 25-32 | 3 | 33 | 9 | 8 | 8 | 61 | |
| 33+ | 3 | 24 | 8 | 6 | 26 | 67 | |
| Total | 16 | 169 | 39 | 42 | 59 | 325 | |
| **HIV/AIDS** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 7 | 46 | 9 | 17 | 9 | 88 | |
| 9-16 | 2 | 31 | 4 | 9 | 9 | 55 | |
| 17-24 | 5 | 28 | 8 | 7 | 6 | 54 | 0.001 |
| 25-32 | 5 | 32 | 9 | 8 | 7 | 61 | |
| 33+ | 4 | 19 | 9 | 7 | 28 | 67 | |
| Total | 23 | 156 | 39 | 48 | 59 | 325 | |
| **Osteoporosis** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 7 | 29 | 9 | 38 | 5 | 88 | |
| 9-16 | 5 | 22 | 5 | 22 | 1 | 55 | |
| 17-24 | 5 | 20 | 5 | 22 | 2 | 54 | 0.897 |
| 25-32 | 7 | 21 | 8 | 23 | 2 | 61 | |
| 33+ | 8 | 24 | 8 | 20 | 7 | 67 | |
| Total | 32 | 116 | 35 | 125 | 17 | 325 | |
| **Pain Management** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 5 | 30 | 10 | 33 | 10 | 88 | |
| 9-16 | 6 | 17 | 6 | 24 | 2 | 55 | |
| 17-24 | 5 | 22 | 7 | 18 | 2 | 54 | 0.842 |
| 25-32 | 7 | 23 | 7 | 21 | 3 | 61 | |
| 33+ | 10 | 22 | 8 | 22 | 5 | 67 | |
| Total | 33 | 114 | 38 | 118 | 22 | 325 | |
| **Parkinson's** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| 1-8 | 4 | 38 | 11 | 28 | 7 | 88 | 0.294 |
| 9-16 | 4 | 25 | 6 | 15 | 5 | 55 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 17-24 | 4 | 28 | 5 | 13 | 4 | 54 | |
| 25-32 | 5 | 29 | 9 | 14 | 4 | 61 | |
| 33+ | 9 | 25 | 7 | 12 | 14 | 67 | |
| Total | 26 | 145 | 38 | 82 | 34 | 325 | |

| **Thyroidism** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ **(P-Value)** |
|---|---|---|---|---|---|---|---|
| 1-8 | 4 | 29 | 11 | 38 | 6 | 88 | |
| 9-16 | 6 | 23 | 4 | 17 | 5 | 55 | |
| 17-24 | 6 | 23 | 6 | 18 | 1 | 54 | 0.138 |
| 25-32 | 9 | 22 | 9 | 17 | 4 | 61 | |
| 33+ | 10 | 23 | 8 | 15 | 11 | 67 | |
| Total | 35 | 120 | 38 | 105 | 27 | 325 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.7: Differences in Pharmacists' Willingness and Capabilities Regarding Patient Characteristics by Work Setting**

| **Low Income** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ **(P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 18 | 32 | 9 | 60 | 2 | 121 | |
| Not Chain | 32 | 65 | 29 | 100 | 4 | 230 | 0.599 |
| Total | 50 | 97 | 38 | 160 | 6 | 351 | |
| Hospital | 12 | 31 | 17 | 48 | 3 | 111 | |
| Not hospital | 38 | 66 | 21 | 112 | 3 | 240 | 0.239 |
| Total | 50 | 97 | 38 | 160 | 6 | 351 | |
| Ind. Retail | 11 | 11 | 3 | 31 | 0 | 56 | |
| Not Ind. Retail | 39 | 86 | 35 | 129 | 6 | 295 | 0.122 |
| Total | 50 | 97 | 38 | 160 | 6 | 351 | |
| Outpatient | 8 | 6 | 4 | 12 | 0 | 30 | |
| Not outpatient | 42 | 91 | 34 | 148 | 6 | 321 | 0.265 |
| Total | 50 | 97 | 38 | 160 | 6 | 351 | |
| Mail Order | 0 | 9 | 6 | 9 | 0 | 24 | |
| Not Mail Order | 50 | 88 | 32 | 151 | 6 | 327 | 0.038 |
| Total | 50 | 97 | 38 | 160 | 6 | 351 | |
| **Medicare/SN** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | $X^2$ **(P-Value)** |
| Chain Retail | 16 | 29 | 16 | 54 | 6 | 121 | |
| Not Chain | 23 | 66 | 41 | 89 | 11 | 230 | 0.538 |
| Total | 39 | 95 | 57 | 143 | 17 | 351 | |
| Hospital | 8 | 34 | 21 | 41 | 7 | 111 | |
| Not hospital | 31 | 61 | 36 | 102 | 10 | 240 | 0.287 |
| Total | 39 | 95 | 57 | 143 | 17 | 351 | |
| Ind. Retail | 10 | 13 | 3 | 27 | 3 | 56 | 0.064 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Not Ind. Retail | 29 | 82 | 54 | 116 | 14 | 295 | |
| Total | 39 | 95 | 57 | 143 | 17 | 351 | |
| Outpatient | 4 | 8 | 8 | 9 | 1 | 30 | |
| Not outpatient | 35 | 87 | 49 | 134 | 16 | 321 | 0.489 |
| Total | 39 | 95 | 57 | 143 | 17 | 351 | |
| Mail Order | 0 | 8 | 7 | 8 | 1 | 24 | |
| Not Mail Order | 39 | 87 | 50 | 135 | 16 | 327 | 0.181 |
| Total | 39 | 95 | 57 | 143 | 17 | 351 | |

| **Uninsured** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 16 | 33 | 11 | 57 | 4 | 121 | |
| Not Chain | 24 | 68 | 36 | 95 | 6 | 229 | 0.409 |
| Total | 40 | 101 | 47 | 152 | 10 | 350 | |
| Hospital | 6 | 34 | 21 | 45 | 5 | 111 | |
| Not hospital | 34 | 67 | 26 | 107 | 5 | 239 | 0.028 |
| Total | 40 | 101 | 47 | 152 | 10 | 350 | |
| Ind. Retail | 10 | 11 | 5 | 28 | 1 | 55 | |
| Not Ind. Retail | 30 | 90 | 42 | 124 | 9 | 295 | 0.173 |
| Total | 40 | 101 | 47 | 152 | 10 | 350 | |
| Outpatient | 4 | 5 | 7 | 13 | 1 | 30 | |
| Not outpatient | 36 | 96 | 40 | 139 | 9 | 320 | 0.377 |
| Total | 40 | 101 | 47 | 152 | 10 | 350 | |
| Mail Order | 0 | 10 | 5 | 8 | 1 | 24 | |
| Not Mail Order | 40 | 91 | 42 | 144 | 9 | 326 | 0.183 |
| Total | 40 | 101 | 47 | 152 | 10 | 350 | |

| **Homeless** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 6 | 38 | 23 | 45 | 9 | 121 | |
| Not Chain | 19 | 74 | 39 | 77 | 20 | 229 | 0.758 |
| Total | 25 | 112 | 62 | 122 | 29 | 350 | |
| Hospital | 5 | 42 | 20 | 38 | 6 | 111 | |
| Not hospital | 20 | 70 | 42 | 84 | 23 | 239 | 0.290 |
| Total | 25 | 112 | 62 | 122 | 29 | 350 | |
| Ind. Retail | 5 | 14 | 5 | 22 | 9 | 55 | |
| Not Ind. Retail | 20 | 98 | 57 | 100 | 20 | 295 | 0.048 |
| Total | 25 | 112 | 62 | 122 | 29 | 350 | |
| Outpatient | 3 | 9 | 5 | 9 | 4 | 30 | |
| Not outpatient | 22 | 103 | 57 | 113 | 25 | 320 | 0.797 |
| Total | 25 | 112 | 62 | 122 | 29 | 350 | |
| Mail Order | 0 | 9 | 6 | 6 | 3 | 24 | |
| Not Mail Order | 25 | 103 | 56 | 116 | 26 | 326 | 0.389 |
| Total | 25 | 112 | 62 | 122 | 29 | 350 | |

| **Medically Complex** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 21 | 38 | 10 | 46 | 6 | 121 | 0.184 |
| Not Chain | 24 | 78 | 34 | 80 | 14 | 230 | |

| | NE | W | C | W & C | D | Total | |
|---|---|---|---|---|---|---|---|
| Total | 45 | 116 | 44 | 126 | 20 | 351 | |
| Hospital | 10 | 37 | 16 | 40 | 8 | 111 | |
| Not hospital | 35 | 79 | 28 | 86 | 12 | 240 | 0.566 |
| Total | 45 | 116 | 44 | 126 | 20 | 351 | |
| Ind. Retail | 7 | 21 | 6 | 22 | 0 | 56 | |
| Not Ind. Retail | 38 | 95 | 38 | 104 | 20 | 295 | 0.332 |
| Total | 45 | 116 | 44 | 126 | 20 | 351 | |
| Outpatient | 4 | 11 | 6 | 9 | 0 | 30 | |
| Not outpatient | 41 | 105 | 38 | 117 | 20 | 321 | 0.436 |
| Total | 45 | 116 | 44 | 126 | 20 | 351 | |
| Mail Order | 0 | 10 | 5 | 8 | 1 | 24 | |
| Not Mail Order | 45 | 106 | 39 | 118 | 19 | 327 | 0.244 |
| Total | 45 | 116 | 44 | 126 | 20 | 351 | |
| **HIV/AIDS** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 14 | 53 | 9 | 28 | 17 | 121 | |
| Not Chain | 14 | 115 | 24 | 36 | 40 | 229 | 0.118 |
| Total | 28 | 168 | 33 | 64 | 57 | 350 | |
| Hospital | 5 | 56 | 13 | 17 | 20 | 111 | |
| Not hospital | 23 | 112 | 20 | 47 | 37 | 239 | 0.323 |
| Total | 28 | 168 | 33 | 64 | 57 | 350 | |
| Ind. Retail | 4 | 28 | 3 | 10 | 10 | 55 | |
| Not Ind. Retail | 24 | 140 | 30 | 54 | 47 | 295 | 0.845 |
| Total | 28 | 168 | 33 | 64 | 57 | 350 | |
| Outpatient | 1 | 12 | 4 | 4 | 9 | 30 | |
| Not outpatient | 27 | 156 | 29 | 60 | 48 | 320 | 0.192 |
| Total | 28 | 168 | 33 | 64 | 57 | 350 | |
| Mail Order | 0 | 9 | 4 | 8 | 3 | 24 | |
| Not Mail Order | 28 | 159 | 29 | 56 | 54 | 326 | 0.112 |
| Total | 28 | 168 | 33 | 64 | 57 | 350 | |
| **Psychosocial Disorder** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 19 | 47 | 14 | 33 | 8 | 121 | |
| Not Chain | 28 | 85 | 26 | 53 | 38 | 230 | 0.119 |
| Total | 47 | 132 | 40 | 86 | 46 | 351 | |
| Hospital | 11 | 41 | 11 | 25 | 23 | 111 | |
| Not hospital | 36 | 91 | 29 | 61 | 23 | 240 | 0.055 |
| Total | 47 | 132 | 40 | 86 | 46 | 351 | |
| Ind. Retail | 8 | 20 | 6 | 21 | 1 | 56 | |
| Not Ind. Retail | 39 | 112 | 34 | 65 | 45 | 295 | 0.024 |
| Total | 47 | 132 | 40 | 86 | 46 | 351 | |
| Outpatient | 1 | 3 | 6 | 6 | 4 | 30 | |
| Not Outpatient | 46 | 119 | 34 | 80 | 42 | 321 | 0.271 |
| Total | 47 | 132 | 40 | 86 | 46 | 351 | |
| Mail Order | 0 | 8 | 5 | 6 | 5 | 24 | 0.149 |

| | NE | W | C | W & C | D | Total | X²(P-Value) |
|---|---|---|---|---|---|---|---|
| Not Mail Order | 47 | 124 | 35 | 80 | 41 | 327 | |
| Total | 47 | 132 | 40 | 86 | 46 | 351 | |
| **Different Race** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X²(P-Value)** |
| Chain Retail | 17 | 40 | 12 | 50 | 2 | 121 | |
| Not Chain | 17 | 85 | 31 | 90 | 7 | 230 | 0.241 |
| Total | 34 | 125 | 43 | 140 | 9 | 351 | |
| Hospital | 8 | 37 | 17 | 45 | 4 | 111 | |
| Not hospital | 26 | 88 | 26 | 95 | 5 | 240 | 0.523 |
| Total | 34 | 125 | 43 | 140 | 9 | 351 | |
| Ind. Retail | 5 | 18 | 4 | 29 | 0 | 56 | |
| Not Ind. Retail | 29 | 107 | 39 | 111 | 9 | 295 | 0.218 |
| Total | 34 | 125 | 43 | 140 | 9 | 351 | |
| Outpatient | 2 | 12 | 5 | 11 | 0 | 30 | |
| Not outpatient | 32 | 113 | 38 | 129 | 9 | 321 | 0.748 |
| Total | 34 | 125 | 43 | 140 | 9 | 351 | |
| Mail Order | 0 | 9 | 4 | 10 | 1 | 24 | |
| Not Mail Order | 34 | 116 | 39 | 130 | 8 | 327 | 0.523 |
| Total | 34 | 125 | 43 | 140 | 9 | 351 | |
| **Non-English Speaking** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X²(P-Value)** |
| Chain Retail | 23 | 53 | 13 | 16 | 16 | 121 | |
| Not Chain | 27 | 108 | 10 | 27 | 57 | 229 | 0.010 |
| Total | 50 | 161 | 23 | 43 | 73 | 350 | |
| Hospital | 13 | 52 | 8 | 9 | 29 | 111 | |
| Not hospital | 37 | 109 | 15 | 34 | 44 | 239 | 0.253 |
| Total | 50 | 161 | 23 | 43 | 73 | 350 | |
| Ind. Retail | 8 | 26 | 2 | 7 | 12 | 55 | |
| Not Ind. Retail | 42 | 135 | 21 | 36 | 61 | 295 | 0.922 |
| Total | 50 | 161 | 23 | 43 | 73 | 350 | |
| Outpatient | 1 | 12 | 3 | 5 | 9 | 30 | |
| Not outpatient | 49 | 149 | 20 | 38 | 64 | 320 | 0.246 |
| Total | 50 | 161 | 23 | 43 | 73 | 350 | |
| Mail Order | 0 | 15 | 1 | 1 | 7 | 24 | |
| Not Mail Order | 50 | 146 | 22 | 42 | 66 | 326 | 0.105 |
| Total | 50 | 161 | 23 | 43 | 73 | 350 | |
| **Criminal Record** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X²(P-Value)** |
| Chain Retail | 15 | 34 | 19 | 38 | 15 | 121 | |
| Not Chain | 16 | 71 | 46 | 68 | 29 | 230 | 0.442 |
| Total | 31 | 105 | 65 | 106 | 44 | 351 | |
| Hospital | 5 | 35 | 21 | 34 | 16 | 111 | |
| Not hospital | 26 | 70 | 44 | 72 | 28 | 240 | 0.397 |
| Total | 31 | 105 | 65 | 106 | 44 | 351 | |
| Ind. Retail | 4 | 18 | 5 | 22 | 7 | 56 | 0.244 |

| | NE | W | C | W & C | D | Total | X²(P-Value) |
|---|---|---|---|---|---|---|---|
| Not Ind. Retail | 27 | 87 | 60 | 84 | 37 | 295 | |
| Total | 31 | 105 | 65 | 106 | 44 | 351 | |
| Outpatient | 2 | 8 | 8 | 8 | 4 | 30 | |
| Not outpatient | 29 | 97 | 57 | 98 | 40 | 321 | 0.806 |
| Total | 31 | 105 | 65 | 106 | 44 | 351 | |
| Mail Order | 1 | 8 | 7 | 6 | 2 | 24 | |
| Not Mail Order | 30 | 97 | 58 | 100 | 42 | 327 | 0.574 |
| Total | 31 | 105 | 65 | 106 | 44 | 351 | |
| **Illicit Drug User** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X²(P-Value)** |
| Chain Retail | 9 | 31 | 20 | 33 | 28 | 121 | |
| Not Chain | 17 | 60 | 47 | 50 | 55 | 229 | 0.794 |
| Total | 26 | 91 | 67 | 83 | 83 | 350 | |
| Hospital | 6 | 32 | 18 | 30 | 25 | 111 | |
| Not hospital | 20 | 59 | 49 | 53 | 58 | 239 | 0.562 |
| Total | 26 | 91 | 67 | 83 | 83 | 350 | |
| Ind. Retail | 6 | 15 | 6 | 17 | 12 | 56 | |
| Not Ind. Retail | 20 | 76 | 61 | 66 | 71 | 294 | .303 |
| Total | 26 | 91 | 67 | 83 | 83 | 350 | |
| Outpatient | 0 | 9 | 9 | 8 | 4 | 30 | |
| Not outpatient | 26 | 82 | 58 | 75 | 79 | 320 | 0.180 |
| Total | 26 | 91 | 67 | 83 | 83 | 350 | |
| Mail Order | 1 | 6 | 7 | 3 | 7 | 24 | |
| Not Mail Order | 25 | 85 | 60 | 80 | 76 | 326 | 0.490 |
| Total | 26 | 91 | 67 | 83 | 83 | 350 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.8: Differences in Pharmacists' Willingness and Capabilities Regarding Non-Dispensing Services by Work Setting**

| **Drug Education** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X²(P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 23 | 25 | 10 | 63 | 0 | 121 | |
| Not Chain | 26 | 62 | 29 | 112 | 1 | 230 | 0.153 |
| Total | 49 | 87 | 39 | 175 | 1 | 351 | |
| Hospital | 8 | 28 | 20 | 54 | 1 | 111 | |
| Not hospital | 41 | 59 | 19 | 121 | 0 | 240 | 0.006 |
| Total | 49 | 87 | 39 | 175 | 1 | 351 | |
| Ind. Retail | 10 | 11 | 2 | 33 | 0 | 56 | |
| Not Ind. Retail | 39 | 76 | 37 | 142 | 1 | 295 | 0.189 |
| Total | 49 | 87 | 39 | 175 | 1 | 351 | |
| Outpatient | 5 | 8 | 5 | 12 | 0 | 30 | 0.761 |
| Not outpatient | 44 | 79 | 34 | 163 | 1 | 321 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 49 | 87 | 39 | 175 | 1 | 351 | |
| Mail Order | 0 | 9 | 4 | 11 | 0 | 24 | |
| Not Mail Order | 49 | 78 | 35 | 164 | 1 | 327 | 0.188 |
| Total | 49 | 87 | 39 | 175 | 1 | 351 | |

| **Adherence Counseling** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 14 | 30 | 13 | 64 | 0 | 121 | |
| Not Chain | 27 | 65 | 28 | 109 | 1 | 230 | 0.826 |
| Total | 41 | 95 | 41 | 173 | 1 | 351 | |
| Hospital | 7 | 33 | 18 | 53 | 0 | 111 | |
| Not hospital | 34 | 62 | 23 | 120 | 1 | 240 | 0.098 |
| Total | 41 | 95 | 41 | 173 | 1 | 351 | |
| Ind. Retail | 10 | 9 | 3 | 34 | 0 | 56 | |
| Not Ind. Retail | 31 | 86 | 38 | 139 | 1 | 295 | 0.052 |
| Total | 41 | 95 | 41 | 173 | 1 | 351 | |
| Outpatient | 7 | 7 | 3 | 13 | 0 | 30 | |
| Not outpatient | 34 | 88 | 38 | 160 | 1 | 321 | 0.356 |
| Total | 41 | 95 | 41 | 173 | 1 | 351 | |
| Mail Order | 0 | 8 | 5 | 11 | 0 | 24 | |
| Not Mail Order | 41 | 87 | 36 | 162 | 1 | 327 | 0.252 |
| Total | 41 | 95 | 41 | 173 | 1 | 351 | |

| **Disease Education** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 10 | 33 | 13 | 61 | 4 | 121 | |
| Not Chain | 25 | 66 | 35 | 97 | 7 | 230 | 0.563 |
| Total | 35 | 99 | 48 | 158 | 11 | 351 | |
| Hospital | 6 | 34 | 22 | 46 | 3 | 111 | |
| Not hospital | 29 | 65 | 26 | 112 | 8 | 240 | 0.067 |
| Total | 35 | 99 | 48 | 158 | 11 | 351 | |
| Ind. Retail | 10 | 14 | 4 | 28 | 0 | 56 | |
| Not Ind. Retail | 25 | 85 | 44 | 130 | 11 | 295 | 0.063 |
| Total | 35 | 99 | 48 | 158 | 11 | 351 | |
| Outpatient | 5 | 7 | 5 | 12 | 1 | 30 | |
| Not outpatient | 30 | 92 | 43 | 146 | 10 | 321 | 0.708 |
| Total | 35 | 99 | 48 | 158 | 11 | 351 | |
| Mail Order | 0 | 9 | 3 | 11 | 1 | 24 | |
| Not Mail Order | 35 | 90 | 45 | 147 | 10 | 327 | 0.482 |
| Total | 35 | 99 | 48 | 158 | 11 | 351 | |

| **Life-Style Modification** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 14 | 28 | 14 | 62 | 3 | 121 | |
| Not Chain | 26 | 70 | 32 | 97 | 5 | 230 | 0.506 |
| Total | 40 | 98 | 46 | 159 | 8 | 351 | |
| Hospital | 7 | 35 | 19 | 47 | 3 | 111 | 0.142 |

| | NE | W | C | W & C | D | Total | X² (P-Value) |
|---|---|---|---|---|---|---|---|
| Not hospital | 33 | 63 | 27 | 112 | 5 | 240 | |
| Total | 40 | 98 | 46 | 159 | 8 | 351 | |
| Ind. Retail | 10 | 10 | 4 | 31 | 1 | 56 | |
| Not Ind. Retail | 30 | 88 | 42 | 128 | 7 | 295 | 0.084 |
| Total | 40 | 98 | 46 | 159 | 8 | 351 | |
| Outpatient | 6 | 8 | 4 | 12 | 0 | 30 | |
| Not outpatient | 34 | 90 | 42 | 147 | 8 | 321 | 0.541 |
| Total | 40 | 98 | 46 | 159 | 8 | 351 | |
| Mail Order | 0 | 10 | 4 | 10 | 0 | 24 | |
| Not Mail Order | 40 | 88 | 42 | 149 | 8 | 327 | 0.232 |
| Total | 40 | 98 | 46 | 159 | 8 | 351 | |
| **Health Screening** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| Chain Retail | 9 | 42 | 19 | 41 | 10 | 121 | |
| Not Chain | 18 | 89 | 34 | 60 | 27 | 228 | 0.563 |
| Total | 27 | 131 | 53 | 101 | 37 | 249 | |
| Hospital | 6 | 37 | 22 | 29 | 17 | 111 | |
| Not hospital | 21 | 94 | 31 | 72 | 20 | 238 | 0.089 |
| Total | 27 | 131 | 53 | 101 | 37 | 349 | |
| Ind. Retail | 9 | 21 | 4 | 19 | 2 | 55 | |
| Not Ind. Retail | 18 | 110 | 49 | 82 | 35 | 294 | 0.013 |
| Total | 27 | 131 | 53 | 101 | 37 | 349 | |
| Outpatient | 2 | 15 | 4 | 8 | 1 | 30 | |
| Not outpatient | 25 | 116 | 49 | 93 | 36 | 319 | 0.529 |
| Total | 27 | 131 | 53 | 101 | 37 | 349 | |
| Mail Order | 0 | 10 | 4 | 7 | 3 | 24 | |
| Not Mail Order | 27 | 121 | 49 | 94 | 34 | 325 | 0.629 |
| Total | 27 | 131 | 53 | 101 | 37 | 349 | |
| **Vaccination** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| Chain Retail | 21 | 29 | 9 | 50 | 12 | 121 | |
| Not Chain | 24 | 73 | 32 | 45 | 56 | 230 | 0.000 |
| Total | 45 | 102 | 41 | 95 | 68 | 351 | |
| Hospital | 7 | 36 | 16 | 21 | 31 | 111 | |
| Not hospital | 38 | 66 | 25 | 74 | 37 | 240 | 0.002 |
| Total | 45 | 102 | 41 | 95 | 68 | 351 | |
| Ind. Retail | 8 | 10 | 4 | 22 | 12 | 56 | |
| Not Ind. Retail | 37 | 92 | 37 | 73 | 56 | 295 | 0.092 |
| Total | 45 | 102 | 41 | 95 | 68 | 351 | |
| Outpatient | 5 | 11 | 4 | 7 | 3 | 30 | |
| Not outpatient | 40 | 91 | 37 | 88 | 65 | 321 | 0.598 |
| Total | 45 | 103 | 41 | 95 | 68 | 351 | |
| Mail Order | 1 | 6 | 6 | 4 | 7 | 24 | |
| Not Mail Order | 44 | 96 | 35 | 91 | 61 | 327 | 0.097 |
| Total | 45 | 102 | 41 | 95 | 68 | 351 | |
| **CMR** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |

| | NE | W | C | W & C | D | Total | X² (P-Value) |
|---|---|---|---|---|---|---|---|
| Chain Retail | 17 | 25 | 18 | 61 | 0 | 121 | |
| Not Chain | 23 | 65 | 32 | 103 | 6 | 229 | 0.155 |
| Total | 40 | 90 | 50 | 164 | 6 | 350 | |
| Hospital | 7 | 29 | 20 | 52 | 3 | 111 | |
| Not hospital | 33 | 61 | 30 | 112 | 3 | 239 | 0.181 |
| Total | 40 | 90 | 50 | 164 | 6 | 250 | |
| Ind. Retail | 10 | 11 | 4 | 29 | 1 | 55 | |
| Not Ind. Retail | 30 | 79 | 46 | 135 | 5 | 295 | 0.187 |
| Total | 40 | 90 | 50 | 164 | 6 | 350 | |
| Outpatient | 4 | 7 | 6 | 13 | 0 | 30 | |
| Not outpatient | 36 | 83 | 44 | 151 | 6 | 320 | 0.813 |
| Total | 40 | 90 | 50 | 164 | 6 | 350 | |
| Mail Order | 0 | 10 | 3 | 10 | 1 | 24 | |
| Not Mail Order | 40 | 80 | 47 | 154 | 5 | 326 | 0.158 |
| Total | 40 | 90 | 50 | 164 | 6 | 350 | |
| **PMR** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| Chain Retail | 12 | 29 | 21 | 57 | 2 | 121 | |
| Not Chain | 18 | 72 | 33 | 96 | 10 | 229 | 0.336 |
| Total | 30 | 101 | 54 | 153 | 12 | 350 | |
| Hospital | 4 | 32 | 23 | 48 | 4 | 111 | |
| Not hospital | 26 | 69 | 31 | 105 | 8 | 239 | 0.105 |
| Total | 30 | 101 | 54 | 153 | 12 | 350 | |
| Ind. Retail | 8 | 15 | 3 | 26 | 3 | 55 | |
| Not Ind. Retail | 22 | 86 | 51 | 127 | 9 | 295 | 0.093 |
| Total | 30 | 101 | 54 | 153 | 12 | 350 | |
| Outpatient | 4 | 6 | 7 | 11 | 2 | 30 | |
| Not outpatient | 26 | 95 | 47 | 142 | 10 | 320 | 0.347 |
| Total | 30 | 101 | 54 | 153 | 12 | 350 | |
| Mail Order | 0 | 10 | 4 | 8 | 2 | 24 | |
| Not Mail Order | 30 | 91 | 50 | 145 | 10 | 326 | 0.189 |
| Total | 30 | 101 | 54 | 153 | 12 | 350 | |
| **MAP** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| Chain Retail | 5 | 34 | 24 | 52 | 6 | 121 | |
| Not Chain | 17 | 79 | 33 | 84 | 17 | 230 | 0.254 |
| Total | 22 | 113 | 57 | 136 | 23 | 351 | |
| Hospital | 6 | 35 | 20 | 43 | 7 | 111 | |
| Not hospital | 16 | 78 | 37 | 93 | 16 | 240 | 0.969 |
| Total | 22 | 113 | 57 | 136 | 23 | 351 | |
| Ind. Retail | 6 | 17 | 4 | 22 | 7 | 56 | |
| Not Ind. Retail | 16 | 96 | 53 | 114 | 16 | 295 | 0.057 |
| Total | 22 | 113 | 57 | 136 | 23 | 351 | |
| Outpatient | 2 | 10 | 6 | 10 | 2 | 30 | |
| Not outpatient | 20 | 103 | 51 | 126 | 21 | 321 | 0.968 |
| Total | 22 | 113 | 57 | 136 | 23 | 351 | |

| Mail Order | 0 | 10 | 3 | 9 | 2 | 24 | |
|---|---|---|---|---|---|---|---|
| Not Mail Order | 22 | 103 | 54 | 127 | 21 | 327 | 0.611 |
| Total | 22 | 113 | 57 | 136 | 23 | 351 | |
| **MTM Program** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| Chain Retail | 4 | 47 | 20 | 38 | 12 | 121 | |
| Not Chain | 12 | 83 | 38 | 72 | 25 | 230 | 0.929 |
| Total | 16 | 130 | 58 | 110 | 37 | 351 | |
| Hospital | 3 | 39 | 24 | 32 | 13 | 111 | |
| Not hospital | 13 | 91 | 34 | 78 | 24 | 240 | 0.346 |
| Total | 16 | 130 | 58 | 110 | 37 | 351 | |
| Ind. Retail | 6 | 14 | 5 | 21 | 10 | 56 | |
| Not Ind. Retail | 10 | 116 | 53 | 89 | 27 | 295 | 0.005 |
| Total | 16 | 130 | 58 | 110 | 37 | 351 | |
| Outpatient | 4 | 9 | 6 | 11 | 0 | 30 | |
| Not outpatient | 12 | 121 | 52 | 99 | 37 | 321 | 0.041 |
| Total | 16 | 130 | 58 | 110 | 37 | 351 | |
| Mail Order | 0 | 10 | 5 | 8 | 1 | 24 | |
| Not Mail Order | 16 | 120 | 53 | 102 | 36 | 327 | 0.620 |
| Total | 16 | 130 | 58 | 110 | 37 | 351 | |
| **Physician Recommendation** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| Chain Retail | 10 | 30 | 22 | 54 | 5 | 121 | |
| Not Chain | 22 | 70 | 39 | 86 | 13 | 230 | 0.645 |
| Total | 32 | 100 | 61 | 140 | 18 | 351 | |
| Hospital | 7 | 36 | 23 | 39 | 6 | 111 | |
| Not hospital | 25 | 64 | 38 | 101 | 12 | 240 | 0.370 |
| Total | 32 | 100 | 61 | 140 | 18 | 351 | |
| Ind. Retail | 8 | 16 | 5 | 23 | 4 | 56 | |
| Not Ind. Retail | 24 | 84 | 56 | 117 | 14 | 295 | 0.263 |
| Total | 32 | 100 | 61 | 140 | 18 | 351 | |
| Outpatient | 5 | 12 | 4 | 9 | 0 | 30 | |
| Not outpatient | 27 | 88 | 57 | 131 | 18 | 321 | 0.173 |
| Total | 32 | 100 | 61 | 140 | 18 | 351 | |
| Mail Order | 0 | 9 | 5 | 9 | 1 | 24 | |
| Not Mail Order | 32 | 91 | 56 | 131 | 17 | 327 | 0.502 |
| Total | 32 | 100 | 61 | 140 | 18 | 351 | |
| **PAP** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$(P-Value)** |
| Chain Retail | 10 | 35 | 18 | 50 | 8 | 121 | |
| Not Chain | 16 | 79 | 39 | 77 | 19 | 230 | 0.602 |
| Total | 26 | 114 | 57 | 127 | 27 | 351 | |
| Hospital | 6 | 38 | 25 | 32 | 10 | 111 | |
| Not hospital | 20 | 76 | 32 | 95 | 17 | 240 | 0.100 |
| Total | 26 | 114 | 57 | 127 | 27 | 351 | |
| Ind. Retail | 4 | 18 | 5 | 25 | 4 | 56 | 0.471 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Not Ind. Retail | 22 | 96 | 52 | 102 | 23 | 295 | |
| Total | 26 | 114 | 57 | 127 | 27 | 351 | |
| Outpatient | 3 | 7 | 6 | 11 | 3 | 30 | |
| Not outpatient | 23 | 107 | 51 | 116 | 24 | 321 | 0.798 |
| Total | 26 | 114 | 57 | 127 | 27 | 351 | |
| Mail Order | 0 | 8 | 2 | 9 | 5 | 24 | |
| Not Mail Order | 26 | 106 | 55 | 118 | 22 | 327 | 0.069 |
| Total | 26 | 114 | 57 | 127 | 27 | 351 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

**Table B.9: Differences in Pharmacists' Willingness and Capabilities Regarding Disease States by Work Setting**

| Alzheimer's | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
|---|---|---|---|---|---|---|---|
| Chain Retail | 6 | 57 | 16 | 32 | 10 | 121 | |
| Not Chain | 20 | 100 | 26 | 58 | 26 | 230 | 0.603 |
| Total | 26 | 157 | 42 | 90 | 36 | 351 | |
| Hospital | 7 | 50 | 15 | 24 | 15 | 111 | |
| Not hospital | 19 | 107 | 27 | 66 | 21 | 240 | 0.510 |
| Total | 26 | 157 | 42 | 90 | 36 | 351 | |
| Ind. Retail | 7 | 20 | 6 | 22 | 1 | 56 | |
| Not Ind. Retail | 19 | 137 | 36 | 68 | 35 | 295 | 0.011 |
| Total | 26 | 157 | 42 | 90 | 36 | 351 | |
| Outpatient | 2 | 15 | 4 | 6 | 3 | 30 | |
| Not outpatient | 24 | 142 | 38 | 84 | 33 | 321 | 0.953 |
| Total | 26 | 157 | 42 | 90 | 36 | 351 | |
| Mail Order | 0 | 9 | 3 | 7 | 5 | 24 | |
| Not Mail Order | 26 | 148 | 39 | 83 | 31 | 327 | 0.272 |
| Total | 26 | 157 | 42 | 90 | 36 | 351 | |
| **Anticoagulation** | NE | W | C | W & C | D | Total | $X^2$ (P-Value) |
| Chain Retail | 11 | 44 | 15 | 41 | 10 | 121 | |
| Not Chain | 22 | 81 | 26 | 77 | 24 | 230 | 0.972 |
| Total | 33 | 125 | 41 | 118 | 34 | 351 | |
| Hospital | 9 | 36 | 17 | 42 | 7 | 111 | |
| Not hospital | 24 | 89 | 24 | 76 | 27 | 240 | 0.252 |
| Total | 33 | 125 | 41 | 118 | 34 | 351 | |
| Ind. Retail | 8 | 18 | 5 | 22 | 3 | 56 | |
| Not Ind. Retail | 25 | 107 | 36 | 96 | 31 | 295 | 0.370 |
| Total | 33 | 125 | 41 | 118 | 34 | 351 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Outpatient | 7 | 8 | 4 | 10 | 1 | 30 | |
| Not outpatient | 26 | 117 | 37 | 108 | 33 | 31 | 0.062 |
| Total | 33 | 125 | 41 | 118 | 34 | 351 | |
| Mail Order | 0 | 10 | 4 | 6 | 4 | 24 | |
| Not Mail Order | 33 | 115 | 37 | 112 | 30 | 327 | 0.277 |
| Total | 33 | 125 | 41 | 118 | 34 | 351 | |
| **Asthma** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 11 | 39 | 14 | 52 | 5 | 121 | |
| Not Chain | 20 | 86 | 28 | 79 | 17 | 230 | 0.469 |
| Total | 31 | 125 | 42 | 131 | 22 | 351 | |
| Hospital | 5 | 42 | 15 | 40 | 9 | 111 | |
| Not hospital | 26 | 83 | 27 | 91 | 13 | 240 | 0.293 |
| Total | 31 | 125 | 42 | 131 | 22 | 351 | |
| Ind. Retail | 10 | 17 | 6 | 21 | 2 | 56 | |
| Not Ind. Retail | 21 | 108 | 36 | 110 | 20 | 295 | 0.111 |
| Total | 31 | 125 | 42 | 131 | 22 | 351 | |
| Outpatient | 5 | 12 | 3 | 9 | 1 | 30 | |
| Not outpatient | 26 | 113 | 39 | 122 | 21 | 321 | 0.480 |
| Total | 31 | 125 | 42 | 131 | 22 | 351 | |
| Mail Order | 0 | 9 | 5 | 8 | 2 | 24 | |
| Not Mail Order | 31 | 116 | 37 | 123 | 20 | 327 | 0.370 |
| Total | 31 | 125 | 42 | 131 | 22 | 351 | |
| **Cardiovascular** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 12 | 35 | 12 | 55 | 7 | 121 | |
| Not Chain | 25 | 75 | 27 | 89 | 14 | 230 | 0.819 |
| Total | 37 | 110 | 39 | 144 | 21 | 351 | |
| Hospital | 7 | 33 | 16 | 46 | 9 | 111 | |
| Not hospital | 30 | 77 | 23 | 98 | 12 | 240 | 0.221 |
| Total | 37 | 110 | 39 | 144 | 21 | 351 | |
| Ind. Retail | 10 | 16 | 4 | 25 | 1 | 56 | |
| Not Ind. Retail | 27 | 94 | 35 | 119 | 20 | 295 | 0.155 |
| Total | 37 | 110 | 39 | 144 | 21 | 351 | |
| Outpatient | 6 | 9 | 3 | 11 | 1 | 30 | |
| Not outpatient | 31 | 101 | 36 | 133 | 20 | 321 | 0.497 |
| Total | 37 | 110 | 39 | 144 | 21 | 351 | |
| Mail Order | 0 | 9 | 5 | 9 | 1 | 24 | |
| Not Mail Order | 37 | 101 | 34 | 135 | 20 | 327 | 0.245 |
| Total | 37 | 110 | 39 | 144 | 21 | 351 | |
| **Chronic Kidney Disease** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 7 | 53 | 19 | 29 | 13 | 121 | |
| Not Chain | 19 | 88 | 31 | 65 | 27 | 230 | 0.708 |
| Total | 26 | 141 | 50 | 94 | 40 | 351 | |

| | NE | W | C | W & C | D | Total | |
|---|---|---|---|---|---|---|---|
| Hospital | 9 | 41 | 19 | 32 | 10 | 111 | |
| Not hospital | 17 | 100 | 31 | 62 | 30 | 240 | 0.638 |
| Total | 26 | 141 | 50 | 94 | 40 | 351 | |
| Ind. Retail | 5 | 27 | 6 | 14 | 4 | 56 | |
| Not Ind. Retail | 21 | 114 | 44 | 80 | 36 | 295 | 0.558 |
| Total | 26 | 141 | 50 | 94 | 40 | 351 | |
| Outpatient | 4 | 15 | 4 | 4 | 3 | 30 | |
| Not outpatient | 22 | 126 | 46 | 90 | 37 | 321 | 0.327 |
| Total | 26 | 141 | 50 | 94 | 40 | 351 | |
| Mail Order | 0 | 8 | 4 | 7 | 5 | 24 | |
| Not Mail Order | 26 | 133 | 46 | 87 | 35 | 327 | 0.357 |
| Total | 26 | 141 | 50 | 94 | 40 | 351 | |
| **COPD** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 11 | 42 | 12 | 49 | 7 | 121 | |
| Not Chain | 21 | 86 | 27 | 77 | 19 | 230 | 0.711 |
| Total | 32 | 128 | 39 | 126 | 26 | 351 | |
| Hospital | 7 | 38 | 18 | 37 | 11 | 111 | |
| Not hospital | 25 | 90 | 21 | 89 | 15 | 240 | 0.130 |
| Total | 32 | 128 | 39 | 126 | 26 | 351 | |
| Ind. Retail | 9 | 20 | 6 | 19 | 2 | 56 | |
| Not Ind. Retail | 23 | 108 | 33 | 107 | 24 | 295 | 0.292 |
| Total | 32 | 128 | 39 | 126 | 26 | 351 | |
| Outpatient | 4 | 14 | 4 | 7 | 1 | 30 | |
| Not outpatient | 28 | 114 | 35 | 119 | 25 | 321 | 0.420 |
| Total | 32 | 128 | 39 | 126 | 26 | 351 | |
| Mail Order | 1 | 9 | 3 | 8 | 3 | 24 | |
| Not Mail Order | 31 | 119 | 36 | 118 | 23 | 327 | 0.792 |
| Total | 32 | 128 | 39 | 126 | 26 | 351 | |
| **Depression** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
| Chain Retail | 9 | 42 | 13 | 48 | 9 | 121 | |
| Not Chain | 17 | 85 | 33 | 80 | 15 | 230 | 0.824 |
| Total | 26 | 127 | 46 | 128 | 24 | 351 | |
| Hospital | 2 | 37 | 23 | 40 | 9 | 111 | |
| Not hospital | 24 | 90 | 23 | 88 | 15 | 240 | 0.005 |
| Total | 26 | 127 | 46 | 128 | 24 | 351 | |
| Ind. Retail | 8 | 10 | 4 | 25 | 1 | 56 | |
| Not Ind. Retail | 18 | 109 | 42 | 103 | 23 | 295 | 0.039 |
| Total | 26 | 127 | 46 | 128 | 24 | 351 | |
| Outpatient | 4 | 14 | 4 | 7 | 1 | 30 | |
| Not outpatient | 22 | 113 | 42 | 121 | 23 | 321 | 0.320 |
| Total | 26 | 127 | 46 | 128 | 24 | 351 | |
| Mail Order | 0 | 10 | 5 | 8 | 1 | 24 | |
| Not Mail Order | 26 | 117 | 41 | 120 | 23 | 327 | 0.458 |
| Total | 26 | 127 | 46 | 128 | 24 | 351 | |

| Diabetes | NE | W | C | W & C | D | Total | X²(P-Value) |
|---|---|---|---|---|---|---|---|
| Chain Retail | 13 | 38 | 12 | 52 | 6 | 121 | |
| Not Chain | 29 | 74 | 23 | 85 | 19 | 230 | 0.700 |
| Total | 42 | 112 | 35 | 137 | 25 | 351 | |
| Hospital | 9 | 36 | 15 | 39 | 12 | 111 | |
| Not hospital | 33 | 76 | 20 | 98 | 13 | 240 | 0.099 |
| Total | 42 | 112 | 35 | 137 | 25 | 351 | |
| Ind. Retail | 12 | 14 | 3 | 27 | 0 | 56 | |
| Not Ind. Retail | 30 | 98 | 32 | 110 | 25 | 295 | 0.009 |
| Total | 42 | 112 | 35 | 137 | 25 | 351 | |
| Outpatient | 7 | 9 | 4 | 9 | 1 | 30 | |
| Not outpatient | 35 | 103 | 31 | 128 | 24 | 321 | 0.258 |
| Total | 42 | 112 | 35 | 137 | 25 | 351 | |
| Mail Order | 0 | 9 | 4 | 9 | 2 | 24 | |
| Not Mail Order | 42 | 103 | 31 | 128 | 23 | 327 | 0.335 |
| Total | 42 | 112 | 35 | 137 | 25 | 351 | |
| **Dyslipidemia** | NE | W | C | W & C | D | Total | X²(P-Value) |
| Chain Retail | 10 | 40 | 13 | 52 | 6 | 121 | |
| Not Chain | 23 | 75 | 27 | 87 | 17 | 229 | 0.814 |
| Total | 33 | 115 | 40 | 139 | 23 | 350 | |
| Hospital | 6 | 35 | 17 | 42 | 10 | 110 | |
| Not hospital | 27 | 80 | 23 | 97 | 13 | 240 | 0.155 |
| Total | 33 | 115 | 40 | 139 | 23 | 350 | |
| Ind. Retail | 10 | 16 | 4 | 25 | 1 | 56 | |
| Not Ind. Retail | 23 | 99 | 36 | 114 | 22 | 294 | 0.056 |
| Total | 33 | 115 | 40 | 139 | 23 | 350 | |
| Outpatient | 6 | 12 | 2 | 8 | 1 | 29 | |
| Not outpatient | 27 | 103 | 38 | 131 | 22 | 321 | 0.128 |
| Total | 33 | 115 | 40 | 139 | 23 | 350 | |
| Mail Order | 0 | 9 | 4 | 9 | 2 | 24 | |
| Not Mail Order | 33 | 106 | 36 | 130 | 21 | 326 | 0.498 |
| Total | 33 | 115 | 40 | 139 | 23 | 350 | |
| **Hepatitis C** | NE | W | C | W & C | D | Total | X²(P-Value) |
| Chain Retail | 4 | 68 | 12 | 20 | 17 | 121 | |
| Not Chain | 15 | 110 | 32 | 25 | 48 | 230 | 0.108 |
| Total | 19 | 178 | 44 | 45 | 65 | 351 | |
| Hospital | 7 | 49 | 20 | 13 | 22 | 111 | |
| Not hospital | 12 | 129 | 24 | 32 | 43 | 240 | 0.213 |
| Total | 19 | 178 | 44 | 45 | 65 | 351 | |
| Ind. Retail | 2 | 30 | 8 | 6 | 10 | 56 | |
| Not Ind. Retail | 17 | 148 | 36 | 39 | 55 | 295 | 0.921 |
| Total | 19 | 178 | 44 | 45 | 65 | 351 | |
| Outpatient | 2 | 15 | 5 | 2 | 6 | 30 | 0.817 |
| Not outpatient | 17 | 163 | 39 | 43 | 59 | 321 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total | 19 | 178 | 44 | 45 | 65 | 351 | |
| Mail Order | 0 | 10 | 4 | 4 | 6 | 24 | |
| Not Mail Order | 19 | 168 | 40 | 41 | 59 | 327 | 0.551 |
| Total | 19 | 178 | 44 | 45 | 65 | 351 | |

| **HIV/AIDS** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 7 | 58 | 16 | 23 | 17 | 121 | |
| Not Chain | 17 | 109 | 30 | 27 | 47 | 230 | 0.285 |
| Total | 24 | 167 | 46 | 50 | 64 | 351 | |
| Hospital | 9 | 48 | 19 | 14 | 21 | 111 | |
| Not hospital | 15 | 119 | 27 | 36 | 43 | 240 | 0.499 |
| Total | 24 | 167 | 46 | 50 | 64 | 351 | |
| Ind. Retail | 2 | 27 | 8 | 9 | 10 | 56 | |
| Not Ind. Retail | 22 | 140 | 38 | 41 | 54 | 295 | 0.865 |
| Total | 24 | 167 | 46 | 50 | 64 | 351 | |
| Outpatient | 3 | 15 | 4 | 2 | 6 | 30 | |
| Not outpatient | 21 | 152 | 42 | 48 | 58 | 321 | 0.754 |
| Total | 24 | 167 | 46 | 50 | 64 | 351 | |
| Mail Order | 0 | 9 | 4 | 6 | 5 | 24 | |
| Not Mail Order | 24 | 158 | 42 | 44 | 59 | 327 | 0.314 |
| Total | 24 | 167 | 46 | 50 | 64 | 351 | |

| **Osteoporosis** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 10 | 45 | 14 | 48 | 4 | 121 | |
| Not Chain | 24 | 79 | 28 | 86 | 13 | 230 | 0.809 |
| Total | 34 | 124 | 42 | 134 | 17 | 351 | |
| Hospital | 9 | 36 | 15 | 41 | 10 | 111 | |
| Not hospital | 25 | 88 | 27 | 93 | 7 | 240 | 0.135 |
| Total | 34 | 124 | 42 | 134 | 17 | 351 | |
| Ind. Retail | 8 | 19 | 5 | 24 | 0 | 56 | |
| Not Ind. Retail | 26 | 105 | 37 | 110 | 17 | 295 | 0.230 |
| Total | 34 | 124 | 42 | 134 | 17 | 351 | |
| Outpatient | 4 | 9 | 5 | 11 | 1 | 30 | |
| Not outpatient | 30 | 115 | 37 | 123 | 16 | 321 | 0.828 |
| Total | 34 | 124 | 42 | 134 | 17 | 351 | |
| Mail Order | 0 | 9 | 5 | 9 | 1 | 24 | |
| Not Mail Order | 34 | 115 | 37 | 125 | 16 | 327 | 0.373 |
| Total | 34 | 124 | 42 | 134 | 17 | 351 | |

| **Pain Management** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **$X^2$ (P-Value)** |
|---|---|---|---|---|---|---|---|
| Chain Retail | 10 | 47 | 16 | 43 | 5 | 121 | |
| Not Chain | 23 | 78 | 28 | 83 | 18 | 230 | 0.641 |
| Total | 33 | 125 | 44 | 126 | 23 | 351 | |
| Hospital | 8 | 38 | 17 | 38 | 10 | 111 | |
| Not hospital | 25 | 87 | 27 | 88 | 13 | 240 | 0.472 |
| Total | 33 | 125 | 44 | 126 | 23 | 351 | |

| | NE | W | C | W & C | D | Total | X² (P-Value) |
|---|---|---|---|---|---|---|---|
| Ind. Retail | 9 | 16 | 4 | 27 | 0 | 56 | |
| Not Ind. Retail | 24 | 109 | 40 | 99 | 23 | 295 | 0.012 |
| Total | 33 | 125 | 44 | 126 | 23 | 351 | |
| Outpatient | 5 | 9 | 4 | 11 | 1 | 30 | |
| Not outpatient | 28 | 116 | 40 | 115 | 22 | 321 | 0.614 |
| Total | 33 | 125 | 44 | 126 | 23 | 351 | |
| Mail Order | 0 | 10 | 5 | 6 | 3 | 24 | |
| Not Mail Order | 33 | 115 | 39 | 120 | 20 | 327 | 0.175 |
| Total | 33 | 125 | 44 | 126 | 23 | 351 | |
| **Parkinson's** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| Chain Retail | 9 | 54 | 14 | 32 | 12 | 121 | |
| Not Chain | 17 | 105 | 32 | 53 | 23 | 230 | 0.948 |
| Total | 26 | 159 | 46 | 85 | 35 | 351 | |
| Hospital | 6 | 50 | 18 | 25 | 12 | 111 | |
| Not hospital | 20 | 109 | 28 | 60 | 23 | 240 | 0.665 |
| Total | 26 | 159 | 46 | 85 | 35 | 351 | |
| Ind. Retail | 6 | 24 | 7 | 16 | 3 | 56 | |
| Not Ind. Retail | 20 | 135 | 39 | 69 | 32 | 295 | 0.552 |
| Total | 26 | 159 | 46 | 85 | 35 | 351 | |
| Outpatient | 3 | 14 | 4 | 6 | 3 | 30 | |
| Not outpatient | 23 | 145 | 42 | 79 | 32 | 321 | 0.968 |
| Total | 26 | 159 | 46 | 85 | 35 | 351 | |
| Mail Order | 0 | 10 | 4 | 7 | 3 | 24 | |
| Not Mail Order | 26 | 149 | 42 | 78 | 32 | 327 | 0.617 |
| Total | 26 | 159 | 46 | 85 | 35 | 351 | |
| **Thyroidism** | **NE** | **W** | **C** | **W & C** | **D** | **Total** | **X² (P-Value)** |
| Chain Retail | 11 | 44 | 14 | 44 | 8 | 121 | |
| Not Chain | 24 | 86 | 30 | 70 | 20 | 230 | 0.810 |
| Total | 35 | 130 | 44 | 114 | 28 | 351 | |
| Hospital | 7 | 41 | 18 | 33 | 12 | 111 | |
| Not hospital | 28 | 89 | 26 | 81 | 16 | 240 | 0.203 |
| Total | 35 | 130 | 44 | 114 | 28 | 351 | |
| Ind. Retail | 8 | 21 | 7 | 19 | 1 | 56 | |
| Not Ind. Retail | 27 | 109 | 37 | 95 | 27 | 295 | 0.343 |
| Total | 35 | 130 | 44 | 114 | 28 | 351 | |
| Outpatient | 6 | 10 | 3 | 10 | 1 | 30 | |
| Not outpatient | 29 | 120 | 41 | 104 | 27 | 321 | 0.343 |
| Total | 35 | 130 | 44 | 114 | 28 | 351 | |
| Mail Order | 1 | 10 | 4 | 7 | 2 | 24 | |
| Not Mail Order | 34 | 120 | 40 | 107 | 26 | 327 | 0.833 |
| Total | 35 | 130 | 44 | 114 | 28 | 351 | |

-W= Willing; C= Capable; A= Assisting; WC= Willing and Capable; WA= Willing and Assisting; CA= Capable and Assisting; WCA= Willing, Capable, and Assisting; Ne= Neither Willing, Capable, or Assisting; D= Declined to respond

# Appendix C


**Response Frequencies, Means, and Correlation Coefficients of Survey Barriers**

**Table C.1: Response Frequency and Correlation Coefficient to Barriers Section**

| Barrier | PS | N | SA | A | Ne | D | SD | Mean | SD± | r |
|---|---|---|---|---|---|---|---|---|---|---|
| Not Enough Training (P) | Yes | 148 | 1 | 23 | 19 | 59 | 46 | 3.85 | 1.05 | -0.247* |
| | No | 202 | 11 | 49 | 44 | 68 | 30 | 3.28 | 1.15 | |
| Bad Experiences (P) | Yes | 148 | 4 | 10 | 29 | 53 | 52 | 3.94 | 1.03 | -0.139 |
| | No | 201 | 3 | 17 | 59 | 87 | 35 | 3.67 | 0.91 | |
| Uncomfortable Assisting (P) | Yes | 147 | 4 | 9 | 13 | 62 | 58 | 4.10 | 0.99 | -0.128 |
| | No | 201 | 2 | 13 | 36 | 109 | 41 | 3.87 | 0.85 | |
| Not Interested (P) | Yes | 147 | 1 | 4 | 16 | 60 | 66 | 4.27 | 0.81 | -0.297* |
| | No | 202 | 5 | 19 | 52 | 84 | 42 | 3.69 | 0.99 | |
| Unable to Make an Improvement (P) | Yes | 147 | 0 | 8 | 10 | 63 | 66 | 4.27 | 0.82 | -0.221* |
| | No | 201 | 1 | 12 | 35 | 111 | 42 | 3.90 | 0.81 | |
| Lack of Patient Appreciation (P) | Yes | 147 | 4 | 11 | 22 | 55 | 55 | 3.99 | 1.04 | -0.161 |
| | No | 202 | 6 | 21 | 41 | 101 | 33 | 3.66 | 0.97 | |
| Unsure Where to Volunteer (V) | Yes | 148 | 8 | 44 | 39 | 35 | 22 | 3.12 | 1.16 | -0.277* |
| | No | 203 | 16 | 109 | 39 | 34 | 5 | 2.52 | 0.95 | |
| Never Approached to Volunteer (V) | Yes | 147 | 26 | 58 | 20 | 25 | 18 | 2.67 | 1.29 | -0.231* |
| | No | 203 | 40 | 116 | 25 | 20 | 2 | 2.15 | 0.89 | |
| Inconvenient Location to Volunteer (V) | Yes | 148 | 2 | 10 | 73 | 40 | 22 | 3.48 | 0.88 | -0.270* |
| | No | 203 | 8 | 25 | 131 | 33 | 6 | 3.02 | 0.75 | |
| Volunteer with other initiatives (V) | Yes | 148 | 11 | 62 | 40 | 23 | 12 | 2.75 | 1.07 | -0.011 |
| | No | 201 | 20 | 75 | 56 | 40 | 10 | 2.73 | 1.05 | |
| Not Enough Time to Volunteer (V) | Yes | 148 | 15 | 44 | 32 | 45 | 12 | 2.97 | 1.16 | -0.153 |
| | No | 202 | 26 | 74 | 56 | 41 | 5 | 2.63 | 1.02 | |

| Barrier | PS | N | SA | A | Ne | D | SD | Mean | SD | |
|---|---|---|---|---|---|---|---|---|---|---|
| Hesitant Before Commitment (HS) | Yes | 148 | 20 | 76 | 21 | 21 | 9 | 2.48 | 1.09 | -0.190* |
| | No | 201 | 35 | 126 | 28 | 7 | 5 | 2.11 | 0.82 | |
| Hesitant due to Legal Ramifications (HS) | Yes | 149 | 7 | 43 | 27 | 47 | 25 | 3.27 | 1.18 | -0.189 |
| | No | 203 | 14 | 79 | 46 | 54 | 10 | 2.84 | 1.05 | |
| Unaccepted by other Health Professionals (W) | Yes | 148 | 4 | 22 | 28 | 62 | 32 | 3.65 | 1.06 | -0.219* |
| | No | 204 | 4 | 53 | 56 | 81 | 10 | 3.20 | 0.95 | |
| Employer Never Approached to Assist (W) | Yes | 135 | 5 | 23 | 45 | 30 | 32 | 3.45 | 1.14 | -0.325* |
| | No | 111 | 10 | 37 | 42 | 18 | 4 | 2.72 | 0.96 | |
| Unwilling Management to Provide Services (W) | Yes | 135 | 4 | 8 | 30 | 49 | 44 | 3.90 | 1.02 | -0.302* |
| | No | 111 | 5 | 17 | 38 | 45 | 6 | 3.27 | 0.94 | |
| Not Enough Time During Shifts to Assist (W) | Yes | 135 | 13 | 35 | 31 | 35 | 22 | 3.13 | 1.24 | -0.351* |
| | No | 111 | 30 | 41 | 22 | 17 | 1 | 2.26 | 1.05 | |
| Pharmacy Does Not have Appropriate Resources (W) | Yes | 135 | 8 | 39 | 27 | 36 | 25 | 3.23 | 1.22 | -0.296* |
| | No | 111 | 23 | 40 | 22 | 22 | 4 | 2.5 | 1.14 | |
| Pharmacy Inaccessible to Underserved (W) | Yes | 136 | 4 | 15 | 16 | 52 | 49 | 3.93 | 1.09 | -0.452* |
| | No | 111 | 20 | 31 | 22 | 31 | 7 | 2.77 | 1.22 | |

*- Barriers added to regression model

- PS= Status providing non-dispensing services; N= sample size; SA= Strongly Agree; A= Agree; Ne= Agree or Disagree; D= Disagree; SD= Strongly Disagree
- (P)= Personal Barrier; (V)= Volunteering Barrier; (W)= Work Place Barrier

# Appendix D

**Study Survey**

# Pharmacist Underserved-Study Survey

## 1. Introduction

The following survey involves providing care to underserved populations. For this survey, the term "underserved" will relate to all segments of the population that struggle to access primary care services. The populations under this definition include, but are not limited to:

-Uninsured
-Underinsured
-Low Income
-Urban Inner City
-Rural
-Non-English speaking
-Minorities
-Homeless (or indigent)
-Medicaid/ Safety Net

Non-dispensing services will be defined as services that are provided in addition to or completely separate from the dispensing of medication. Examples of these services include but are not limited to:

-Educating patients on the proper administration and side effects of a new medication
-Reviewing all prescription and nonprescription medications a patient is taking in order to identify duplication, potential adverse drug events, cheaper drug substitutions, medications for diseases a patient is not diagnosed with, etc.
-Preparation of a list of medications that the patient is currently taking which includes drug name, strength, the time and quantity by which medication is taken, and the healthcare provider who provided/ prescribed the medication
-Educating a patient on strategies to improve adherence
-Educating a patient on lifestyle changes he or she should make to improve the management of his or her disease
-Administration of vaccines

**2.**

**1. Are you a licensed pharmacist in the State of Ohio?**

◯ Yes                                    ◯ No

## 3.

**1. Do you reside in an area that allows you to provide pharmacy services to a population that resides in the State of Ohio?**

◯ Yes                                    ◯ No

## 4. Current Involvement with Underserved Populations

**1. Do you regularly provide non-dispensing pharmacy services to underserved populations**

◯ Yes            ◯ No

## 5.

### 1. Where do you provide non-dispensing services to underserved populations? (Please indicate either Yes or No for each place)

| | Yes | No |
|---|---|---|
| Community Health Center | ○ | ○ |
| Free Medical Clinic | ○ | ○ |
| Pharmacy of Employment | ○ | ○ |

Other (please specify)

[                    ]

### 2. Location: (Please indicate either Yes or No for each location)

| | Yes | No |
|---|---|---|
| Rural | ○ | ○ |
| Rural: Close proximity to suburbia/metropolis | ○ | ○ |
| Suburban | ○ | ○ |
| Metropolis (city) | ○ | ○ |
| Within Primary Metropolis (Inner City) | ○ | ○ |

## 6. Willingness, Capabilities, and Involvement with Underserved

In this section of the survey you will be asked to evaluate yourself in regards to your willingness and capabilities providing nondispensing services to underserved populations.

Please assess your willingness based on the question if given the opportunity to participate in the following scenarios am I internally motivated to become involved. Survey designers would interpret individuals who are interested or excited in the scenario to be willing. Individuals who are hesitant, have doubts, or lack interest would be considered not willing.

Please assess your capabilities based on the question if given the opportunity to participate in the following scenarios am I comfortable and confident completing the expectations of that role. Survey designers would interpret individuals who perceive themselves as trained in that area, confident they can meet the expectations, and/or comfortable executing the tasks as capable. Individuals who are hesitant or have doubts concerning there abilities to execute the task would be considered incapable.

**1. If presented the opportunity, please indicate if you are willing and/or capable to provide non-dispensing pharmacy services to the following underserved populations. If you are regularly providing non-dispensing services to any of the groups please indicate which groups you are working with by checking the "Assisting" column associated with the population in addition to the "Willing" and "Capable" columns. (Check all that apply)**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Assisting | Decline to Answer |
|---|---|---|---|---|
| Low Income | ☐ | ☐ | ☐ | ☐ |
| Medicaid/ Safety Net | ☐ | ☐ | ☐ | ☐ |
| Uninsured | ☐ | ☐ | ☐ | ☐ |
| Homeless | ☐ | ☐ | ☐ | ☐ |

**2. If presented the opportunity, please indicate if you are willing and/or capable to provide non-dispensing pharmacy services to underserved populations with the following characteristics. If you are regularly providing non-dispensing services any of the groups please indicate which groups you are working with by checking the "Assisting" column associated with the characteristic in addition to the "Willing" and "Capable" columns. (Check all that apply)**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Assisting | Decline to Answer |
|---|---|---|---|---|
| Multiple Disease States (or medically complex cases) | ☐ | ☐ | ☐ | ☐ |
| HIV/AIDS | ☐ | ☐ | ☐ | ☐ |
| Psychiatric Illness/ psychosocial problems | ☐ | ☐ | ☐ | ☐ |
| Race/Ethnic groups different from your own | ☐ | ☐ | ☐ | ☐ |
| Non-English Speaking | ☐ | ☐ | ☐ | ☐ |
| Criminal Record | ☐ | ☐ | ☐ | ☐ |
| Incarcerated | ☐ | ☐ | ☐ | ☐ |
| Illicit Drug Users | ☐ | ☐ | ☐ | ☐ |

**3. If presented the opportunity, please indicate if you are willing and/or capable to provide the following non-dispensing pharmacy services to underserved populations. If you are regularly providing any of these services please indicate which services you are providing by checking the "Providing" column associated with the service in addition to the "Willing" and "Capable" columns. (Check all that apply)**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Providing | Decline to Answer |
|---|---|---|---|---|
| Educate patients on the proper administration and possible side effects of a newly prescribed medication | ☐ | ☐ | ☐ | ☐ |
| Work with patients to improve medication adherence through the implementation of different strategies and reminders | ☐ | ☐ | ☐ | ☐ |
| Educate patients on their disease | ☐ | ☐ | ☐ | ☐ |
| Counsel patients on lifestyle modifications | ☐ | ☐ | ☐ | ☐ |
| Provide health screenings | ☐ | ☐ | ☐ | ☐ |
| Provide vaccinations | ☐ | ☐ | ☐ | ☐ |
| Review all prescription and non-prescription medications a patient is currently taking in order to identify therapeutic duplication or unnecessary medications, incorrect dose or dosing regimes, adherence issues, untreated diseases or conditions, areas to reduce medication costs, and possible symptoms linked to adverse drug events. | ☐ | ☐ | ☐ | ☐ |
| Compile a comprehensive record of all prescription and nonprescription medications which includes important drug information such as drug name, indication, instructions for use, prescriber contact information, and special instructions to aid in the patient's self management of their medication. | ☐ | ☐ | ☐ | ☐ |
| Provide patients with a plan that recommends action steps the patient should complete to improve their disease management | ☐ | ☐ | ☐ | ☐ |
| Enroll patients into a program where patient and pharmacist routinely meet (every 3 to 6 months) to evaluate a patient's health status and drug therapy management in order to improve clinical results | ☐ | ☐ | ☐ | ☐ |
| Notify or provide recommendations to the patient's physician or service provider regarding an aspect of the patient's current therapy | ☐ | ☐ | ☐ | ☐ |
| Assist patient with the enrollment into a prescription assistance program of the pharmaceutical manufacturing company that supplies the patient's medication | ☐ | ☐ | ☐ | ☐ |

**4. If presented the opportunity, please indicate if you are willing and/or capable to provide the following non-dispensing pharmacy services to underserved populations with the following diseases. If you are regularly assisting patients with certain diseases please indicate which diseases by checking the "Providing" column associated with the disease state in addition to the "Willing" and "Capable" columns. (Check all that apply)**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Providing | Decline to Answer |
|---|---|---|---|---|
| Alzheimer's Disease | ☐ | ☐ | ☐ | ☐ |
| Anticoagulation | ☐ | ☐ | ☐ | ☐ |
| Asthma | ☐ | ☐ | ☐ | ☐ |
| Cardiovascular/ Hypertension | ☐ | ☐ | ☐ | ☐ |
| Chronic Kidney Disease | ☐ | ☐ | ☐ | ☐ |
| COPD | ☐ | ☐ | ☐ | ☐ |
| Depression | ☐ | ☐ | ☐ | ☐ |
| Diabetes | ☐ | ☐ | ☐ | ☐ |
| Dyslipidemia | ☐ | ☐ | ☐ | ☐ |
| HIV/AIDS | ☐ | ☐ | ☐ | ☐ |
| Hepatitis C | ☐ | ☐ | ☐ | ☐ |
| Osteoporosis | ☐ | ☐ | ☐ | ☐ |
| Pain Management | ☐ | ☐ | ☐ | ☐ |
| Parkinson's Disease | ☐ | ☐ | ☐ | ☐ |
| Thyroid Disease | ☐ | ☐ | ☐ | ☐ |

Other (please specify)

[                                        ]

## 7. Willingness and Capabilities in regards to Underserved Patients

In this section of the survey you will be asked to evaluate yourself in regards to your willingness and capabilities providing nondispensing services to underserved populations.

Please assess your willingness based on the question if given the opportunity to participate in the following scenarios am I internally motivated to become involved. Survey designers would interpret individuals who are interested or excited in the scenario to be willing. Individuals who are hesitant, have doubts, or lack interest would be considered not willing.

Please assess your capabilities based on the question if given the opportunity to participate in the following scenarios am I comfortable and confident completing the expectations of that role. Survey designers would interpret individuals who perceive themselves as trained in that area, confident they can meet the expectations, and/or comfortable executing the tasks as capable. Individuals who are hesitant or have doubts concerning there abilities to execute the task would be considered incapable.

**1. If presented the opportunity, please indicate if you are willing and/or capable to provide non-dispensing pharmacy services to the following underserved populations. If willing, place a check in the appropriate row of the "Willing" column. If you perceive yourself as capable, place a check in the appropriate row of the "Capable" column. Check all that apply in each row**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Decline to Answer |
|---|---|---|---|
| Low Income | ☐ | ☐ | ☐ |
| Medicaid/ Safety Net | ☐ | ☐ | ☐ |
| Uninsured | ☐ | ☐ | ☐ |
| Homeless | ☐ | ☐ | ☐ |

# Pharmacist Underserved-Study Survey

**2. If presented the opportunity, please indicate if you are willing and/or capable to provide non-dispensing pharmacy services to underserved populations with the following characteristics. If willing, place a check in the appropriate row of the "Willing" column. If you perceive yourself as capable, place a check in the appropriate row of the "Capable" column. Check all that apply in each row**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Decline to Answer |
|---|---|---|---|
| Multiple Disease States (or medically complex cases) | ☐ | ☐ | ☐ |
| HIV/AIDS | ☐ | ☐ | ☐ |
| Psychiatric Illness/ Psychosoccial problems | ☐ | ☐ | ☐ |
| Race/Ethnic groups different from your own | ☐ | ☐ | ☐ |
| Non-English Speaking | ☐ | ☐ | ☐ |
| Criminal Record | ☐ | ☐ | ☐ |
| Illicit Drug Users | ☐ | ☐ | ☐ |

**3. If presented the opportunity, please indicate if you are willing and/or capable to provide the following non-dispensing pharmacy services to underserved populations. If willing, place a check in the appropriate row of the "Willing" column. If you perceive yourself as capable, place a check in the appropriate row of the "Capable" column. Check all that apply in each row**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Decline to Answer |
|---|---|---|---|
| Educate patients on the proper administration and possible side effects of a newly prescribed medication | ☐ | ☐ | ☐ |
| Work with patients to improve medication adherence through the implementation of different strategies and reminders | ☐ | ☐ | ☐ |
| Educate patients on their disease | ☐ | ☐ | ☐ |
| Counsel patients on lifestyle modifications | ☐ | ☐ | ☐ |
| Provide health screenings | ☐ | ☐ | ☐ |
| Provide vaccinations | ☐ | ☐ | ☐ |
| Review all prescription and non-prescription medication a patient is currently taking in order to identify therapeutic duplication or unnecessary medication, incorrect dose or dosing regimes, adherence issues, untreated diseases or conditions, areas to reduce medication costs, and possible symptoms linked to adverse drug events. | ☐ | ☐ | ☐ |
| Compile a comprehensive record of all prescription and nonprescription medication which includes important drug information such as drug name, indication, instructions for use, prescriber contact information, and special instructions to aid in the patient's self management of their medication. | ☐ | ☐ | ☐ |
| Provide patients with a plan that recommends action steps the patient should complete to improve their disease management | ☐ | ☐ | ☐ |
| Enroll patients into a program where patients and pharmacist routinely meet (every 3 to 6 months) to evaluate a patient's health status and drug therapy management in order to improve clinical results | ☐ | ☐ | ☐ |
| Notify or provide recommendations to the patient's physician or service provider regarding an aspect of the patient's current therapy | ☐ | ☐ | ☐ |
| Assist patient with the enrollment into a prescription assistance program of the pharmaceutical manufacturing company that supplies the patient's medication | ☐ | ☐ | ☐ |

**4. If presented the opportunity, please indicate if you are willing and/or capable to provide the following non-dispensing pharmacy services to underserved populations with the following diseases. If willing, place a check in the appropriate row of the "Willing" column. If you perceive yourself as capable, place a check in the appropriate row of the "Capable" column. Check all that apply in each row**

**If you do not feel comfortable answering the question, please do not leave the question blank. Check the "Decline to Answer" column.**

| | Willing | Capable | Decline to Answer |
|---|---|---|---|
| Alzheimer's Disease | ☐ | ☐ | ☐ |
| Anticoagulation | ☐ | ☐ | ☐ |
| Asthma | ☐ | ☐ | ☐ |
| Cardiovascular/ Hypertension | ☐ | ☐ | ☐ |
| Chronic Kidney Disease | ☐ | ☐ | ☐ |
| COPD | ☐ | ☐ | ☐ |
| Depression | ☐ | ☐ | ☐ |
| Diabetes | ☐ | ☐ | ☐ |
| Dyslipidemia | ☐ | ☐ | ☐ |
| HIV/AIDS | ☐ | ☐ | ☐ |
| Hepatitis C | ☐ | ☐ | ☐ |
| Osteoporosis | ☐ | ☐ | ☐ |
| Pain Management | ☐ | ☐ | ☐ |
| Parkinson's Disease | ☐ | ☐ | ☐ |
| Thyroid Disease | ☐ | ☐ | ☐ |

Other (please specify)

[                                        ]

## 8. Barriers to Working with Underserved Populations

Barriers to providing nondispensing services to underserved populations

### 1. Personal Barriers:

**Please assess the personal barriers you may face in providing non-dispensing services to underserved populations. Indicate to what extent you agree or disagree with the following statements.**

|  | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| I do not feel that I have enough training or experience providing non-dispensing services. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I feel my assistance will not improve the health condition of underserved populations. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I have had bad experiences working with underserved populations in the past. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I am uncomfortable working with underserved populations. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I do not feel that the patients would appreciate my services. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I am not interested in this aspect of pharmacy practice. | ◯ | ◯ | ◯ | ◯ | ◯ |

### 2. Barriers to Volunteering:

**Please assess the barriers you may experience in regards to volunteering in programs that provide services to underserved populations. Indicate to what extent you agree or disagree with the following statements.**

|  | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| I do not know where I can volunteer to assist underserved populations. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I have never been approached by programs or providers that work with underserved populations to volunteer with their efforts. | ◯ | ◯ | ◯ | ◯ | ◯ |
| The closest location that provides services to the underserved is too far away or inconvenient to volunteer at. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I volunteer my time with other initiatives (pharmacy or non-pharmacy related). | ◯ | ◯ | ◯ | ◯ | ◯ |
| Currently, I do not have the available time to volunteer outside of work. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I am hesitant to volunteer before knowing the time commitment and obligations. | ◯ | ◯ | ◯ | ◯ | ◯ |

**3. General Health Care System Barriers:**

**Please assess the barriers you may experience caused by the general health care system when considering providing non-dispensing services to underserved populations. Please indicate to what extent you agree or disagree with the following statements.**

| | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| I am concerned about the legal ramifications involved with providing non-dispensing services. | ◯ | ◯ | ◯ | ◯ | ◯ |
| I do not feel that other health providers would appreciate the services I can provide. | ◯ | ◯ | ◯ | ◯ | ◯ |

**4. Do you have the ability or the opportunity to assist and counsel patients at your place of employment in your current role?**

◯ Yes

◯ No

## 9. Work Place Barriers

### 1. Work Place Barriers:

**Please assess current barriers at your primary place of employment in providing non-dispensing services to underserved populations. Indicate to what extent you agree or disagree with the following statements.**

| | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| My place of work has never been approached by organizations or providers to assist with underserved populations. | ○ | ○ | ○ | ○ | ○ |
| I get the impression that the management is unwilling or uninterested in providing non-dispensing services to underserved populations. | ○ | ○ | ○ | ○ | ○ |
| The staff does not have the time during our shifts to provide non-dispensing services to underserved populations. | ○ | ○ | ○ | ○ | ○ |
| The pharmacy does not have the appropriate resources (materials, space, equipment) to provide non-dispensing services. | ○ | ○ | ○ | ○ | ○ |
| My location of work is not in an area where underserved populations can easily access it. | ○ | ○ | ○ | ○ | ○ |

## 10. Demographic Information

Please answer the following questions to provide information on your career as a pharmacist and demographics.

### 1. Highest level of education/training (Check all that apply)

☐ B.S. Pharmacy

☐ Pharm. D

☐ Postdoctoral Residency

☐ Postdoctoral Fellowship

☐ Other (please specify)

### 2. Do you possess a Board of Pharmacy Certification?

◯ Yes

◯ No

## 11.

### 1. Which BPS certification(s) do you possess?

☐ Ambulatory Care

☐ Nuclear

☐ Nutrition support

☐ Oncology

☐ Pharmacotherapy

☐ Psychiatric

### 2. Years of practice

☐

### 3. Practice setting (Check all that apply)

☐ Academia

☐ Hospital Pharmacy

☐ Outpatient Care

☐ Chain Retail Pharmacy (includes Mass Merchandiser, Grocery store, etc)

☐ Independent Community Pharmacy

☐ Community Health Center

☐ Mail Order Pharmacy

☐ Retired

☐ Other (please specify)

### 4. Age

☐

### 5. Gender

◯ Male

◯ Female

## 6. Race/ ethnicity

○ Hispanic/ Latino

○ American Indian or Alaskan Native

○ Black or African American

○ White

○ Asian

○ Native Hawaiian/ Other Pacific Islander

○ Two or More Races

○ Unknown

○ Decline to Answer

## 12. Finish

The survey is now complete. Thank you for your participation.