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USING THE THEORY OF PLANNED BEHAVIOR TO PREDICT TEXAS COMMUNITY PHARMACISTS' WILLINGNESS TO PROVIDE STERILE SYRINGES TO KNOWN OR SUSPECTED INTRAVENOUS DRUG USERS

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USING THE THEORY OF PLANNED BEHAVIOR TO PREDICT TEXAS COMMUNITY PHARMACISTS' WILLINGNESS TO PROVIDE STERILE SYRINGES TO KNOWN OR SUSPECTED INTRAVENOUS DRUG USERS

by

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DEDICATION

In loving memory to my mother, Jan Hacker Goss.

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The purpose of this dissertation was to use the Theory of Planned Behavior (TPB) to predict Texas community pharmacists' willingness to provide sterile syringes to known or suspected intravenous drug users (IDUs). The study explored the utility of the TPB constructs (attitude, subjective norm, perceived behavioral control) and recent past behavior to predict willingness to provide sterile syringes as well as determined if attitude towards the provision of sterile syringes to known or suspected IDUs differed by gender.

A total of 500 surveys, developed from three structured focus groups, were mailed to practicing Texas community pharmacists. An overall response rate of 35.1 percent was obtained. In general, pharmacists were not willing to provide sterile syringes to known or suspected IDUs, held negative attitudes toward the provision of sterile syringes, were somewhat influenced by social norms and perceived to have some control over the provision of sterile syringes. For belief-based measured constructs of the TPB, attitude

was the only significant predictor of willingness to provide sterile syringes to known or suspected IDUs. When recent past behavior was entered into the regression model, attitude, subjective norm and recent past behavior were significant predictors. For direct measured constructs of the TPB, attitude and subjective norm were significant predictors of willingness, whereas, attitude, subjective norm and recent past behavior were significant predictors when recent past behavior was entered into the regression model. Overall, recent past behavior contributed significantly to the regression model. Attitude did not differ by gender.

Even though subjective norm was a significant predictor when recent past behavior was entered into the regression model for both belief-based and direct measured constructs of the TPB, attitude and recent past behavior were the strongest predictors of willingness. In summary, this study identified factors that partially explain why community pharmacists are willing or not willing to provide sterile syringes to known or suspected IDUs. Attitudes should be targeted to increase community pharmacists' willingness to provide sterile syringes. Public health officials and pharmacists can then use this information to better position themselves to meet the health needs and expectations of the community.

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CHAPTER 1

INTRODUCTION

> There is a broad consensus in the public health and AIDS advocacy arenas that preventing the transmission of HIV by increasing injection drug users' (IDUs) access to sterile syringes is a scientifically sound, legitimate public health response to the significant number of HIV cases in the U.S. that are directly or indirectly tied to injection drug use. An emerging strategy is to increase IDUs' access to sterile syringes through retail pharmacies (United States Conference of Mayors, 1999).

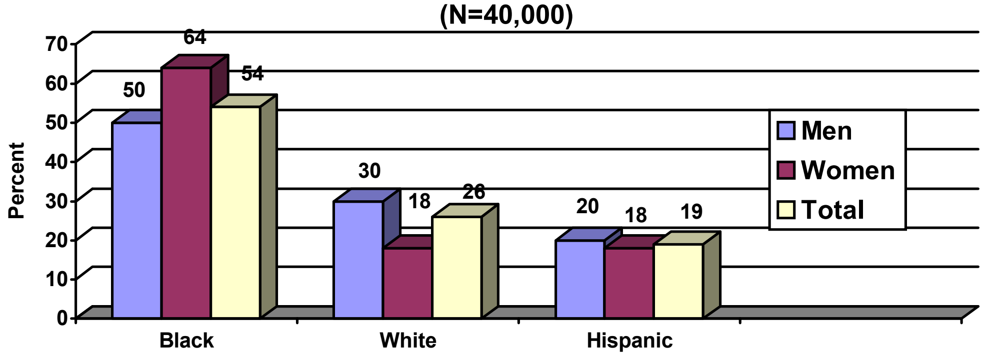
The premise of this research is the role of the community pharmacist in the prevention of HIV and other blood-borne pathogens (e.g., hepatitis) among intravenous drug users (IDUs). Intravenous drug use is a major risk factor for HIV infection in the U.S., and hence, a major contributor to the incidence of AIDS (CDC, 1997; HHS, 1998). IDUs are at greatest risk for HIV/AIDS when they share contaminated syringes and other drug injection equipment. (For this paper, the term syringe will be used despite the fact that needle and syringe are often used interchangeably throughout the literature. Also, the term "needle exchange program" (NEP) used in this paper refers to any establishment at which injecting drug users can exchange a used syringe for a new (sterile) syringe. NEP has become the most common way of referring to these programs even though "syringe exchange program" (SEP) is sometimes used within the literature.) If IDUs inject with sterile syringes and do not share drug injection equipment, their risk of infection from drug-related blood-borne pathogens is lowered. The World Health Organization (WHO) defines a safe injection as one that does not cause harm to the recipient, does not expose the health worker to avoidable risk, and does not result in waste that puts other people (the community) at risk (Battersby, Feilden and Nelson, 1999).

HIV/AIDS and Intravenous Drug Use

HIV and other blood-borne pathogens (e.g., hepatitis) transcend all boundaries; they do not discriminate sexually, racially, economically, or geographically. Over 60 million people are living with HIV/AIDS worldwide (Kates et al., 2002). At the end of 2001, an estimated 362,827 people were living with AIDS (including children and adults) in the U.S. (CDC, 2001a). In the U.S. alone, AIDS is the leading cause of death among men and women between the ages of 25 and 44 among all groups. Since the beginning of the U.S. HIV/AIDS epidemic, approximately one million people have been infected with HIV and close to 800,000 people have been diagnosed with AIDS (Kates et al., 2002). As of December 2001, the Centers for Disease Control and Prevention (CDC) reported that 800,000 to 900,000 people in the U.S. are living with HIV and 30 percent of the new HIV infections each year occur among women (CDC, 2001b). Annually, 40,000 to 80,000 Americans become infected with HIV. One in 250 people in the U.S. become infected with HIV mostly through behaviors that are preventable (NIH, 1997).

Race. Ethnic minorities account for 25 percent of the total U.S. population, but represent more than 50 percent of the cumulative AIDS cases (Needle et al., 2003). Statistics show that more than half (54 percent) of the new HIV infections in the U.S. occur among the African-American population. Figure 1.1 reflects estimates of new HIV infections by gender and race.

Figure 1.1
Estimates of Annual New HIV Cases by Race and Gender, U.S., 2001
(N=40,000)

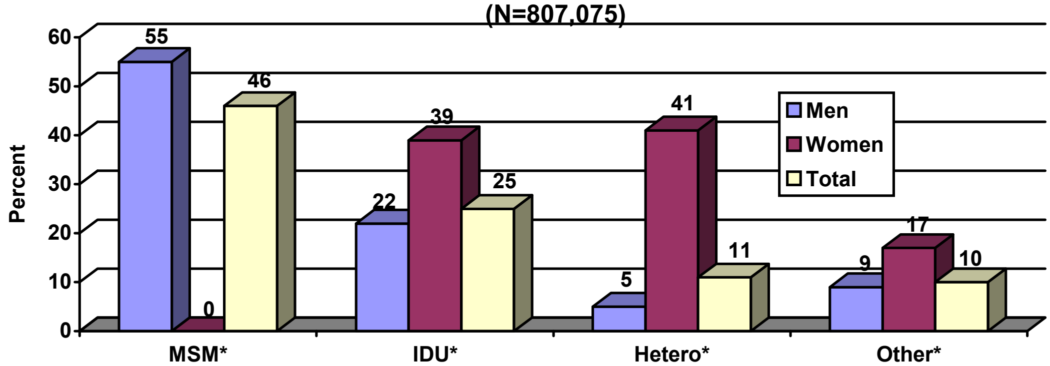


Source: CDC. Update: A Glance at the HIV Epidemic. December 2001.

According to Figure 1.1, Hispanics are also disproportionately affected by the HIV virus (19 percent) since Hispanics make up approximately 12 percent of the U.S. population. Overall, the African-American and Hispanic populations are greatly affected by HIV among men and women. HIV/AIDS is the leading cause of death among African-Americans between the ages of 25 to 44 years of age (Kates et al., 2002). It is important to note that Asian/Pacific Islander and American Indian/Alaska Native ethnicities each make up less than one percent of the new HIV infections and AIDS cases in the U.S. Ethnic minorities now represent the majority of new HIV infections and people living with AIDS (Kates et al., 2002).

Risk Factors. Figure 1.2 displays AIDS cases by the top four risk factors and gender as reported by the CDC through December 2001.

Figure 1.2
AIDS Cases by Risk Factor and Gender, U.S.,
Through December 2001
(N=807,075)



*MSM=Men who have sex with men, IDU=Intravenous drug user, Hetero=Heterosexual contact, Other=Not reported or unidentified risk factors.
Source: Centers for Disease Control and Prevention. HIV/AIDS Surveillance Report. 2001; 13(2), 1-44.

Since 1981, intravenous drug use has played a major role in the spread of HIV/AIDS in the U.S. (HHS, 1998). After men who have sex with men (MSM), IDUs are the second largest group of persons with AIDS in the U.S., accounting for 25 percent of the U.S. AIDS population each cumulative year (CDC, 2001a). Other risk factors not reported in Figure 1.2 accounted for six percent or less of the AIDS population including MSM/IDU (6%), hemophilia (1%), and blood transfusions (1%). From January to December 2001, 46 percent and 25 percent of the AIDS cases were reported by MSM and IDUs, respectively. A total of 201,326 cumulative AIDS cases reported through December 2001 have been linked to intravenous drug use. When risk factors were grouped into single mode of exposure and multiple mode of exposure, 76 percent of the AIDS cases were due to single mode of exposure with 44 percent related to MSM and 19 percent related to intravenous drug use.

Like the HIV/AIDS epidemic, society is directly or indirectly affected by the very real problem of drug use. With an estimated 15.9 million people having used an illicit substance at least once in 2001 (ONDCP, 2003) and an estimated 1.5 million people injecting drugs intravenously in the U.S. (Holmberg, 1996), HIV prevention research among IDUs has been pushed to the forefront. It is estimated that between 30 to 40 percent of all diagnosed AIDS cases reported in the U.S. have been directly or indirectly linked to intravenous drug use (Holmberg, 1996; Day, 1998; HHS, 1998; CDC, 2002). In 2001 alone, almost 5,000 deaths of person with AIDS were related to intravenous drug use (CDC, 2001a).

IDUs are at substantial risk of becoming infected with HIV and other blood-borne infections primarily through the sharing of syringes and other drug injection equipment such as cookers, water, etc. The spread of the HIV/AIDS epidemic among IDUs is due to the fact that persons who use or abuse drugs often partake in behaviors that can be detrimental to their health, exposing themselves and/or their sexual partners to HIV and other blood-borne diseases. Even with the threat of AIDS, the direct and indirect sharing of drug injection equipment by more than one person is commonly practiced among IDUs (Mandell et al., 1994). Factors contributing to the IDU's level of risk include the type of injected drug, frequency of injection, availability of sterile injection equipment (e.g., sterile syringes), method of preparing injected drug and chosen location to prepare and inject the drug (AED, 1997). However, the risk of HIV infection is not limited to the IDU but also exists for his/her sexual partners. Furthermore, the possibility of HIV transmission to the non-injecting community is increased by the fact that some IDUs exchange sex for money or drugs and condoms are not always used. HIV/AIDS can then be transferred to their sexual partners via sexual transmission and to their offspring via vertical transmission (Valleroy et al., 1995).

According to the CDC (1996), the number of AIDS cases attributed to intravenous drug use increased steadily from 12 to 32 percent from 1981 to 1996. Of the 42,983 new adult cases of AIDS reported in the U.S in 2001, 8,975 cases were IDU-related (CDC, 2001a). There are three primary groups that drive the HIV/AIDS epidemic: 1) young and minority men who have sex with men (MSM), 2) intravenous drug users and their sexual partners and children; and 3) heterosexual women who inject drugs (CDC, 2001a). Perhaps the two most challenging public health issues that face health care providers today are HIV/AIDS and intravenous drug use, commonly referred to by the National Commission on Acquired Immune Deficiency Syndrome (1991) as the "twin epidemics."

The impact is greatly felt among adult IDUs in minority communities. The African-American and Hispanic communities have been particularly hard hit. Figures 1.3 and 1.4 depict the percentage of AIDS cases reported in the U.S. through December 2001 by the top three risk factors, gender, and race.

Figure 1.3
Adult Male AIDS Cases by Risk Factor and Race, U.S.,
Through December 2001
(N=666,026)

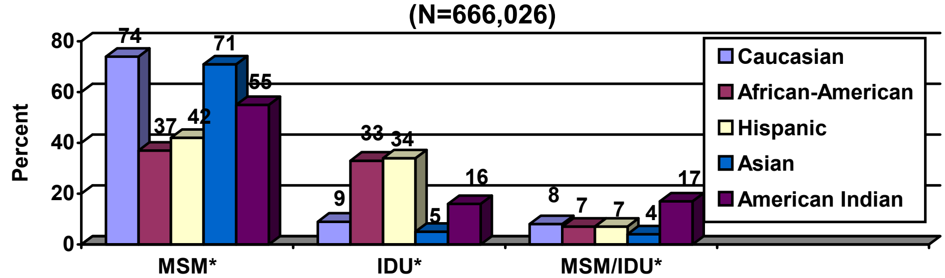
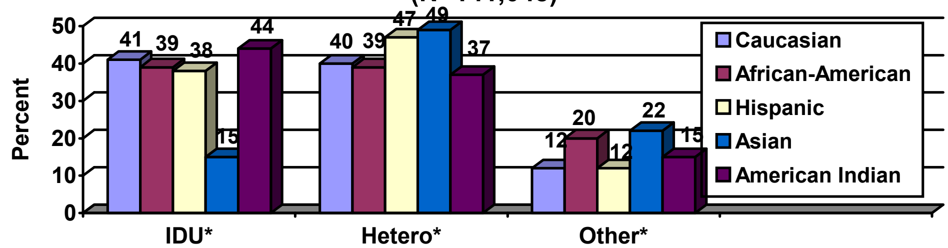


Figure 1.4
Adult Female AIDS Cases by Risk Factor and Race, U.S.,
Through December 2001
(N=141,048)



*MSM=Men who have sex with men, IDU=Intravenous drug user, MSM/IDU=Men who have sex with men and inject drugs, Hetero=Heterosexual contact, Other=Not reported or unidentifiable risk factors.
Note: Data do not equal 100 percent. Only partial data is shown.
Source: Centers for Disease Control and Prevention. HIV/AIDS Surveillance Report. 2001; 13(2), 1-44.

For adult males, hemophilia and blood transfusions each accounted for two percent or less of all AIDS cases among each ethnic group. Heterosexual contact accounted for two percent for Caucasian, eight percent for African-American, six percent for Hispanic, four percent for Asian and three percent for American Indian. “Other” risk factors not reflected in Figure 1.3 accounted for 14 percent of AIDS cases among African-Americans and 13 percent among Asians. For adult females, hemophilia accounted for one percent or less of all AIDS cases among each ethnic group while blood transfusions accounted for 13 percent of AIDS cases among Asians and six percent among Caucasians.

By December 2001, 106,811 African-Americans had injection-related AIDS or had died from it (CDC, 2001a). Over 6,000 adult African-Americans were diagnosed with AIDS in 2001 resulting from intravenous drug use. Statistics show that the 6,155 adult African-Americans who reported new cases of injection-related AIDS in 2001 was more than three times that among Caucasians (N=1,941). With twice as many African-Americans than Caucasians injecting drugs, African-Americans are four times more likely than Caucasians to get AIDS. Also, for African-Americans, the risk of getting injection-related AIDS is more than four times greater than the risk of dying from a drug overdose. HIV/AIDS is the leading cause of death among African-Americans between the ages of 25 and 44 living in the U.S, with over half of the cases related to injections with contaminated syringes. This is twice the percentage of Caucasians (25%) in the same age group (Day, 1998).

By the end of December 2001, more than 50,000 adult Hispanics had injection-related AIDS or had died from it. In 2001, an estimated 2,475 new cases were diagnosed among adult Hispanics. AIDS is the leading cause of death in Hispanics aged 25 to 44 and more than half of those deaths were related to intravenous drug use. Thirty percent of all AIDS cases among Hispanics in the U.S. in 2001 were drug-related (CDC, 2001a). Among IDUs, Hispanics are at least one and a half times more likely than Caucasians to contract AIDS (Day, 1998).

In addition to minorities, women and children have been negatively affected by the HIV/AIDS epidemic among IDUs. Intravenous drug use has directly or indirectly been linked to over 70 percent of HIV infections among women of childbearing potential.

Minority women under the age of 30 have a higher prevalence of HIV than that of other population groups. As with children, more than 75 percent of babies diagnosed with HIV/AIDS were directly or indirectly infected by a parent who injects drugs (HHS, 1998). Thus, it is important to address these special population groups when designing and implementing HIV/AIDS prevention programs.

Hepatitis and Intravenous Drug Use

In addition to HIV, hepatitis can be transmitted from person to person via contaminated needles (van Beck et al., 1998). Hepatitis is a virus that is spread through fecal/oral routes or through infected blood/body fluids. Of Hepatitis A, B, C, D, E, and G, hepatitis-infected IDUs are most commonly infected with Hepatitis C. However, Hepatitis B is common in 44 to 80 percent of IDUs (Lum et al., 2003). High Hepatitis C prevalence rates from young IDUs and IDUs who have been injecting for a short time have been reported in the literature (Alter and Moyer, 1998; Garfein et al., 1998). From 1988 to 1999, there were 3.9 million estimated Hepatitis C infections in the U.S. (CDC, 2000). Sixty percent of reported Hepatitis C infections is related to intravenous drug use with 15 percent related to sex, 10 percent related to transfusions, 10 percent related to unknown sources and five percent related to other sources. Hepatitis C is more infectious than HIV and four times more common than HIV in the U.S. Hepatitis C is expected to be the cause of more deaths than AIDS worldwide within the next 10 to 15 years. The highest rates of Hepatitis C are among IDUs. It is estimated that 20 to 40 percent of IDUs will become infected within a year of starting to use needles, increasing to over 50 percent after one to five years and 92 percent after more than five years of using needles. It is important not to forget Hepatitis as a blood-borne pathogen transmitted via contaminated syringes since Hepatitis can cause chronic inflammation of the liver, leading to cirrhosis and liver cancer, and ultimately death.

Texas Statistics

In 2002, Texas reported 4,731 HIV cases and 2,956 AIDS cases (TDH, 2002). In 2001, Texas ranked fourth in the U.S. in the number of AIDS cases reported (CDC, 2001a). For Texas adult males from January to December 2001, the AIDS rate was 27.2/100,000, which remained much higher than that for women (7.4/100,000). Both rates were below the national average for men (28.1/100,000) and women (9.1/100,000) (CDC, 2001a). Through December 2001, Texas has reported approximately 56,344 adult AIDS cases (CDC, 2001a), with the Dallas area having the highest rate of AIDS cases reported in Texas in 2001 (20.5/100,000) followed by Houston (18.7/100,000) and Austin (15.8/100,000). Rates of AIDS cases do not, however, reflect the number of cumulative AIDS cases reported in such areas. In 2001, Houston reported the highest cumulative number of AIDS cases with 19,898 cases followed by Dallas (N=13,119) and San Antonio (N=4,157). Figures 1.5 and 1.6 show adult HIV and AIDS cases by risk category and gender for 2002 in Texas.

Figure 1.5
Adult HIV Cases Reported by Risk Factor and Gender, TX, 2002
(N=4,702)

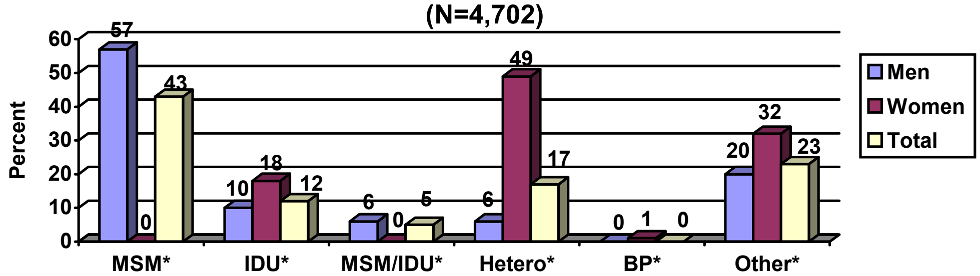
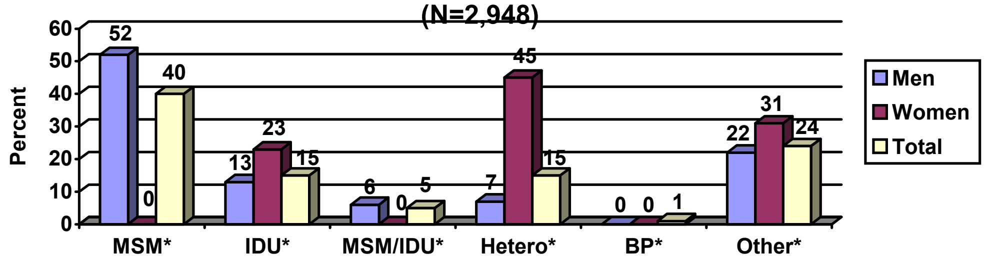


Figure 1.6
Adult AIDS Cases Reported by Risk Factor and Gender, TX, 2002
(N=2,948)



*MSM=Men who have sex with men, IDU=Intravenous drug user, MSM/IDU=Men who have sex with men and inject drugs, Hetero=Heterosexual contact, BP=Blood Product, Other=not reported or unidentifiable risk factors.
Source: Texas Department of Health. Texas HIV/AIDS Surveillance Report. December 31, 2002.

As seen with the national statistics, adult Texas men who have sex with men (MSM) is the largest group of persons with HIV/AIDS followed by "Other" and IDUs. For adult Texas women, heterosexual contact (45 to 49 percent) was the most likely route of transmission for HIV and AIDS. Eighteen percent of adult HIV cases and 23 percent of adult AIDS cases that were reported in 2002 among Texas women were IDU-related. Among men and women in Texas, intravenous drug use was the third most likely route of transmission for HIV or AIDS. IDU-related AIDS cases have increased from 16 percent to 27 percent from 1987 to September 2002 (Maxwell, 2002), indicating a need for HIV/AIDS prevention strategies among Texas IDUs.

In 2001, the Texas population (N=21,175,281) was comprised of 52 percent Caucasians, 32 percent Hispanic, 11 percent African-American and three percent "Other" ethnicities (Maxwell, 2002). From January to December 2002, 4,702 adult HIV cases were reported with 39 percent of the cases reported among the African-American population, 38 percent among the Caucasian population and 22 percent among the Hispanic population. Figures 1.7 and 1.8 reflect HIV and AIDS cases reported in Texas by race and gender.

Figure 1.7
Adult HIV Cases Reported by Race and Gender, TX, 2002
(N=4,702)

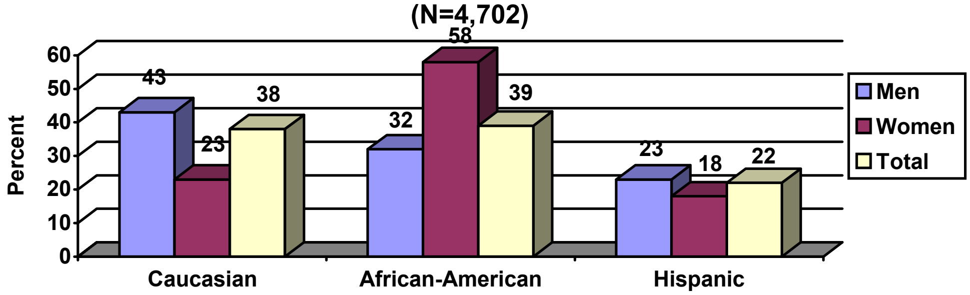
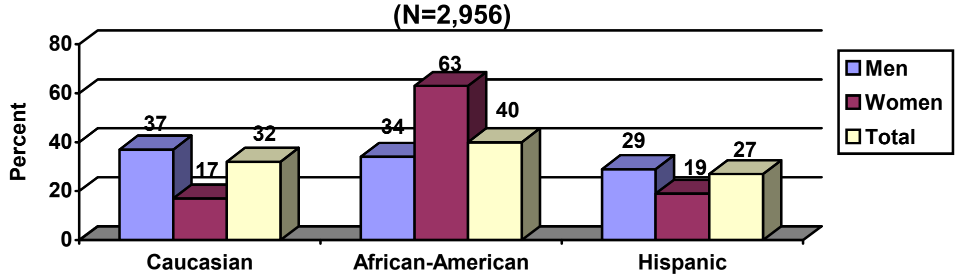


Figure 1.8
Adult AIDS Cases Reported by Race and Gender, TX, 2002
(N=2,956)



Source: Texas Department of Health (TDH). Texas HIV/STD Surveillance Report. December 31, 2002.

Among Texas women, more HIV and AIDS cases were reported among the African-American population in 2002 than among any other ethnic group. The rate of reported AIDS cases in 2002 among all African-Americans in Texas was more than four times higher than that of Caucasians or Hispanics, whereas, the rate of HIV infection among African-Americans in Texas was more than six times higher than that of Caucasians. According to the Texas Department of Health (TDH, 2002), the African-American population has shown an increase in the number of AIDS cases reported in 2001 to 2002 (1,141 cases to 1,185 cases), while Hispanics have shown a slight decrease in the number of AIDS cases reported (807 to 784 percent). Among Texas women, AIDS cases have shown an increase of 16 percent in 1998 compared to nine percent in 1992. In addition to the increasing proportions of AIDS cases due to intravenous drugs, the proportions of minorities and females are increasing which indicates that AIDS is spreading among minorities and female populations in Texas (TDH, 2000; Maxwell, 2002).

The need to prevent the spread of blood-borne pathogens in Texas among IDUs should be made a priority since rates of alcohol and drug use were only slightly lower in Texas than the national rate (Texas-7 percent; U.S.-10 percent). According to a 1996 survey of substance abuse among adults in Texas, 26 percent of Texans (N=2,088 out of 8,031) or an estimated 60,000 persons across the state reported that they knowingly or unknowingly shared a needle with another IDU, placing each other at risk for infection with a blood-borne disease (Wallisch, 1997). In a study conducted by Hwang et al., (2001) that examined the prevalence of sexually transmitted diseases (STD) such as HIV and hepatitis among drug and alcohol users who are in treatment, the researchers concluded that the prevalence of sexually transmitted diseases among drug users is at a clinically significant level. Of the 400 people in drug abuse treatment in three sites in

Texas, 44 percent had markers for Hepatitis B or C. With intravenous drug use prevalent and HIV/AIDS and other blood-borne pathogens (e.g., hepatitis) on the rise in women and Hispanics in Texas, state officials, professional organizations and community leaders must make a significant contribution to reduce the spread of blood-borne pathogens among the IDU population.

Pharmacists' Role in HIV/AIDS and Other Blood-Borne Pathogens Prevention Strategies Among IDUs

In an effort to reduce the threat of infection from HIV and other blood-borne pathogens among IDUs, public health officials in the United States and the world have advocated the use of sterile syringes for injections; one sterile syringe for each injection. A complementary approach to NEPs in increasing the availability of sterile syringes for IDUs has been to involve community pharmacists in the sale, distribution or exchange of syringes. Pharmacists are a vital source for sterile syringes; they are often viewed by public health officials as "gatekeepers" for IDUs to obtain syringes (AED, 1997). Hence, community pharmacists should be on the forefront in promoting IDU-related HIV and other blood-borne pathogens education and disease prevention programs.

Two influential events have greatly affected the level of community pharmacists' involvement in community-based disease education and prevention programs targeting the IDU population. The first event was the change in the profession of pharmacy that began in the 1960's. After the 1960's, pharmacists began to expand professional functions and roles, moving from the "traditional" role of dispensing manufactured drug products to a more "clinical" role of collecting patient and prescriber information and conducting drug utilization reviews (Hepler and Strand, 1990). The emphasis in the new "patient-care" paradigm has been oriented toward patient outcomes through pharmaceutical care. With the shifting of the pharmaceutical paradigm, pharmacists have taken more responsibility for patient outcomes and the coordination and continuity of patient care with other disciplines.

Concurrently, while pharmacists were expanding and redefining their professional roles within the community, other health professionals were redefining their roles and developing community-level intervention programs. These health education and disease prevention activities are aimed at changing community-wide norms and practices in order to change individual behavior (Wolitski, Rietmeijer and Guenther-Grey, 1999). Community-level interventions have addressed many health concerns, including condom use, smoking cessation, obesity, alcohol consumption, drug use and now HIV/AIDS prevention. Since community pharmacists are considered to be the most accessible and available healthcare professional, it seems only logical for community pharmacists to engage in community health education and disease prevention activities. Implementing preventative programs such as HIV/AIDS prevention in community pharmacies may be valuable to the community (Paluck, Stratton and Eni, 1994). The transition of the patient-care stage for the pharmacy profession came at a time that was conducive to the push for community disease prevention activities.

It has been the AIDS epidemic, however, that has truly redefined the role of the community pharmacist within the community, bridging the gap between public health and pharmacy. As one of the most easily accessible health care professionals, community pharmacists should be considered as prospective community resources for HIV/AIDS preventative measures. How can community pharmacists contribute to HIV/AIDS health education and other blood-borne pathogens prevention programs? One answer is that community pharmacists can play a more active role in the provision of HIV/AIDS and other blood-borne pathogens preventative services. Community pharmacists can modify existing services as well as initiate new services. Such services may include selling condoms and other safer sex products as well as providing counseling on safer sex practices and drug use behaviors (Meyers et al., 1995).

However, one of the most controversial issues to date regarding the role of community pharmacists in HIV and other blood-borne pathogen education and prevention programs is that of their involvement in NEPs and/or the provision of sterile syringes to known or suspected IDUs. Since community pharmacists are considered principle community health care providers, they are identified as potential suppliers of sterile syringes and other safer injection equipment (Myers et al., 1995).

So why should community pharmacists provide sterile syringes to known or suspected IDUs? Community pharmacists' education, experience, access to sterile syringes and role in the community make them well-suited for the responsibilities associated with the provision of sterile syringes. According to a Gallup poll, 67 percent of surveyed professionals ranked pharmacists as the most respected of all professionals (Haddad, 1990). Community pharmacists are in an excellent position to expand their HIV/AIDS knowledge and skills and participate in public health initiatives. It makes public health sense to provide sterile syringes to known or suspected IDUs in community pharmacies. A relevant question is how many community pharmacies provide sterile syringes to known or suspected IDUs or participate in other IDU-related and/or blood-borne related prevention services? A review of the scientific literature revealed no recent national surveys that addressed this issue. Whatever the reason for supporting community pharmacists in the provision of sterile syringes to known or suspected IDUs, it is important that the pharmacy profession, as well as other health professions, first achieve a better understanding of how community pharmacists' attitudes shape their intentions (willingness) to provide sterile syringes to known or suspected IDUs. What compels some community pharmacists to participate in IDU-related HIV and other blood-borne pathogens prevention programs while other community pharmacists strongly object? How can such a legitimate public health strategy (e.g., one sterile syringe for each injection) work if community pharmacists are not willing to provide nonprescription syringes to known or suspected IDUs?

The purpose of this study, therefore, is to achieve a better understanding of why community pharmacists are willing or not willing to provide sterile syringes to known or suspected IDUs to help prevent the spread of HIV and other blood-borne pathogens (e.g., hepatitis).

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CHAPTER 2

LITERATURE REVIEW

Harm Reduction Approach

With statistics showing the increasing spread of HIV and other blood-borne pathogens (e.g., hepatitis) among the intravenous drug user (IDU) population, why are public health officials not strengthening their fight against drugs? Why would public health officials want to make it easier for IDUs to obtain drug injection equipment (i.e., sterile syringes)? To thoroughly examine the community pharmacist's role in the provision of sterile syringes to known or suspected IDUs, it is imperative to discuss the harm reduction model, the concept behind such initiatives as needle exchange programs (NEPs) and the provision of sterile syringes to known or suspected IDUs. Harm reduction is not a new concept. However, not until this past decade has this concept gained recognition as a framework to identify various strategies to target the consequences of drug use rather than the "use" itself, changing the overall orientation of many health and human service approaches.

Harm reduction aims to reduce drug-related health and social problems. It is based on a hierarchy of goals where immediate and achievable goals take priority, such as slowing the spread of HIV and other blood-borne pathogens among IDUs. IDU-related harm reduction approaches generally view abstinence as the most effective means of avoiding drug-related problems, though abstinence should not be a prerequisite for other services (Marlatt, 1996; Roche, Evans and Stanton, 1997). Within the harm reduction framework, “zero-tolerance” is seen as antithetical to public health and a burden to the criminal justice system (Nadelmann et al., 1997). Since the harm reduction framework is still under development, there is no consensus on its fundamentals. Harm reduction activists do not believe a drug-free society is realistic, and thus, recognize the need for new approaches to reduce or minimize harm. The purpose of harm reduction strategies is not to punish IDUs, but to support IDUs in reducing or minimizing harm to themselves and to others.

The harm reduction model can be discussed on three levels: conceptual, practical and policy (Fisk, 1998). Conceptually, the harm reduction approach has a “value-neutral” view of drug use and drug users. Drug use is seen as problematic and harmful to the user as well as the community. Instead of stigmatizing the drug user, the model views the users as an active competent player, making choices and taking responsibility for these choices. In order to effectively use harm reduction strategies, agencies must let go of the moralistic fervor attached to HIV/AIDS and drug use.

On a practical level, the harm reduction model focuses on immediate, reliable goals. For example, government health officials may declare that AIDS and/or hepatitis present greater threats to public health, and henceforth, AIDS and hepatitis prevention efforts should take precedence over anti-drug efforts. As a result, the provision of sterile syringes to IDUs would then have a higher priority than abstinence or other long-term goals. Long-term goals are still considered and attained in the harm reduction model, however, the model realizes that change is incremental and occurs over time. Harm reduction strategies do not encourage or legitimize illicit drug use, but acknowledges that it cannot be eliminated. This gradual step-down approach encourages individuals with excessive or high-risk behaviors to take it “one-step at a time” to reduce the harmful consequences of their behavior. Fisk (1998) noted that harm reduction approaches seek active participation from both the IDUs and providers of services. Without dual participation, the programs are ineffective.

From a policy standpoint, harm reduction strategies may seem to be in direct opposition to the U.S. drug policy that is based on the notion of “zero tolerance.” Drug policies cannot be based on an idealistic belief that illicit drug use will be eliminated or that drug users will always use drugs safely. Consequently, the harm reduction approach is not in need of more services but in need of policy change. It is important to distinguish between polices designed to “punish” the drug user and policies designed to allow drug users the freedom to express their needs and concerns. Drug polices should be assessed on their actual consequences, not on whether they symbolically send the right, the wrong, or mixed messages (Des Jarlais, 1995). The harm reduction model supports abstinence as the safest practice, but safer intravenous drug use is also supported as a means of reducing potential harm for those who are already using intravenous drugs.

Community-based local efforts have given harm reduction programs the impetus since harm reduction has not been promoted or supported as a national drug policy on a national/federal level. The twin epidemics (substance abuse and HIV/AIDS) are so stigmatized and morally condemned that persons who suffer from these problems are often marginalized by society, resulting in few advocacy groups for addicts and/or HIV-positive persons (associated with intravenous drug use). Nevertheless, one such harm reduction strategy, needle exchange programs (NEPs), has come to the forefront due to addiction advocacy groups (Marlatt, 1996). However, the provision of sterile syringes and other programs conflict with dominant drug policies (e.g., "Just Say No" campaign), making it difficult to adopt harm reduction policies by legal authorities.

Legal Issues

Across the United States, the limited supply of sterile syringes is the result of a montage of state and local laws and regulations governing the possession, sale, and distribution of sterile injection equipment (Legal Strategies, 1996; Legality, 2000). According to The United States Conference of Mayors (USCM, 1999), these legal rules were adopted as part of a prevention strategy that resulted in what has been called an "artificial scarcity" of sterile injection equipment with detrimental public health consequences for IDUs. The interrelated legislative and regulatory provisions fall into four main categories: (1) state and municipal drug paraphernalia laws, (2) the Federal Mail Order Drug Paraphernalia Control Act, (3) state syringe prescription laws, and (4) pharmacy regulations and practice guidelines (Gostin, 1998). Despite state and federal laws hindering programs that provide sterile syringes to IDUs, all states have laws that empower state and local health officials to take necessary action to prevent the transmission of disease or to respond to public health emergencies (Legal Strategies, 1996; Burris et al., 1996). Such laws are in contrast with Europe and Canada's legal systems. Few of these countries ever enacted prescription or drug paraphernalia laws, and the two that did, France and Austria, revoked them during the mid-1980s (Nadelmann et al., 1997).

Drug Paraphernalia Laws. Forty-seven states, the District of Columbia, and the Virgin Islands have drug paraphernalia statutes (Gostin et al., 1997; Gostin, 1998; Bluthenthal et al., 1999). These laws are the main nation-wide legal barriers to IDUs obtaining and possessing syringes. These statutes ban the manufacture, sale, distribution, possession, or advertisement of a broad assortment of devices, including syringes. Such laws may discourage IDUs from obtaining drug injection equipment, including sterile syringes, from a pharmacy for fear of being arrested, and thus, leading to syringe sharing (Gleghorn et al., 1995; Grund, et al., 1995; Case, Beckett, and Jones, 1998; Bluthenthal et al., 1999). As of 1997, 47 states make it a criminal offense for individuals who possess drug paraphernalia for the purpose of using a controlled substance (Bluthenthal et al., 1999). Technically, it is not an offense under these laws to provide sterile syringes to a customer if the pharmacist truly believes that the syringes will be used for a lawful purpose such as treating diabetes with insulin. However, a pharmacist could be found legally liable if the pharmacist knew that they would be used to inject illegal substances.

Five states (Hawaii, Maryland, Massachusetts, New York, and Rhode Island) and the District of Columbia have exceptions to their drug paraphernalia laws for operations of NEPs. Five states (Connecticut, Maryland, Massachusetts, New York, and Rhode Island) require NEP users to carry a certificate of participation. Five states (Alaska, Colorado, Iowa, Maryland, and Michigan) have local ordinances that regulate the possession, sale, or manufacture of drug paraphernalia (Gostin et al., 1997). Two states

(Oregon and Maine) removed drug policy barriers to syringe exchange without formally authorizing needle exchange (Burris et al., 1996). Gostin (1998) noted that only three states (Alaska, Iowa and South Carolina) and four territories (Guam, Northern Mariana Islands, Puerto Rico and American Samoa) have no statewide or territory-wide drug paraphernalia laws.

In states where IDUs legally can purchase sterile syringes without a prescription, police can continue to arrest such individuals for possession of drug paraphernalia (e.g., syringes). In 1993, Massachusetts's laws were amended to legalize the possession, distribution, or exchange of syringes as part of a pilot NEP. This was followed one year later by an order from the Boston police commissioner instructing Boston police officers not to charge IDUs participating in the pilot program with illegal possession of syringes. Case, Meehan, and Jones (1998) conducted a study to assess the number of arrests for syringe possession in 10 large cities in Massachusetts between 1991 and 1995. Results showed that arrests, prosecutions, convictions and incarcerations of IDUs for possession of syringes continued in 1994 and 1995, after the amendment of the syringe prescription law. The authors noted that the police required that an IDU surrender syringes or dispose of them to avoid further charges, and thus, placing the IDU at higher risk for sharing syringes and being infected with the HIV virus. Also, the authors concluded that drug treatment may be more cost effective than the enforcement of drug paraphernalia and prescription laws when dealing with the social problem of drug addiction.

Federal Mail Order Drug Paraphernalia Control Act. In 1986, The Federal Mail Order Drug Paraphernalia Control Act was passed, banning the sale and transportation of drug injection equipment, including syringes, in interstate commerce (Gostin et al., 1997). This introduces federal jurisdiction that can override state legislatures and law enforcers if they allowed greater access to drug injection equipment. Federal enforcement authorities potentially can prosecute most activities relating to the exchange and possession of drug paraphernalia, regardless of state enforcement decisions, since most syringes pass through interstate commerce (Gostin, 1998). For some reason, this drug policy is not strictly enforced since many NEPs operate from formal legal authorization under a state drug law or from authorization under local interpretations of state drug laws or public health laws.

Syringe Prescription Laws. Syringe prescription laws ban the dispensing or possession of hypodermic syringes without a valid medical prescription. Syringe prescription statutes differ from drug paraphernalia statues in that prosecutors of drug paraphernalia laws are required to prove criminal intent. Criminal intent is not required for a violation of syringe prescription laws. The simple action of selling or providing a sterile syringe without a prescription in a jurisdiction with such laws is itself a violation. The pharmacist dispensing the syringe without a prescription does not have to be aware that the purchaser intends to use it to administer illicit drugs. Eight states (California, Delaware, Illinois, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island) and one territory (the Virgin Islands) have prescription laws, restricting the provision of sterile syringes to IDUs without a prescription to (Gostin, 1998). Certain states require prescriptions to establish a legitimate purpose for specific classes of customers. For example, Virginia requires prescriptions for syringe sales to individuals under the age of 16 years, whereas, Florida requires prescriptions for syringe sales to individuals under the age of 18 years. Other states or localities may permit nonprescription sales only to persons with a legitimate medical need (e.g., Michigan, Nevada, Ohio, Texas, Virginia, and Washington). Michigan does not require prescriptions for the provision of needles and syringes. However, the cities of Warren, Westland, and Detroit have local ordinances placing restrictions on the purchase and or possession of syringes (Gostin et al., 1997).

In Connecticut, the possession and purchase of up to 10 syringes without a prescription became legal in July 1992 as a public health measure to reduce the transmission of HIV/AIDS among IDUs. In a study conducted by Valleroy and colleagues (1995), Connecticut pharmacies sold nonprescription syringes when allowed to do so. Fifteen months after the new laws, 83 percent of the 139 pharmacy managers interviewed via telephone reported selling nonprescription syringes. Despite the overwhelming majority of pharmacists selling nonprescription syringes, 19 percent reported negative incidents or situations at the pharmacy in relation to the sale of syringes without prescriptions. Less serious incidences included pharmacists' or customers' complaints about the sale of syringes to IDUs. More serious incidences involved customers engaging in violent behaviors, increases in shoplifting, IDUs injecting drugs in the pharmacy and used syringes found inside and outside the pharmacy. The researchers felt that states and other jurisdictions should repeal laws that restrict access to sterile syringes. The researchers also suggested that public health officials in states without syringe prescription laws should conduct research to determine the percentage of pharmacists selling nonprescription syringes.

Changes in the Connecticut laws also have been associated with decreases in self-reported syringe sharing behaviors and increases in purchasing of sterile syringes by IDUs from reliable sources such as pharmacies and NEPs (Grund et al., 1995). Groseclose and colleagues (1995) conducted a cross-sectional survey of IDUs after the laws went into effect. Among IDUs with a history of sharing syringes, there was a 39 percent decrease in the proportion who, in the previous 30 days, reported sharing a syringe in the period after the new laws, compared with the period before the changes. It was reported by Diaz et al. (1998) that the dramatic decline in sharing among HIV-infected IDUs in Connecticut began with the state's amendment to the syringe prescription and drug paraphernalia laws. Since this decrease in HIV-infected IDU syringe-sharing behavior coincided with the implementation of Connecticut's new laws and since the other sites in the study (none of which had changes to prescription laws during this period) did not demonstrate a similar decline, it is suggested that eliminating barriers to acquiring and possessing sterile syringes should decrease HIV transmission among IDUs. It is important to note, however, that the researchers could not determine exactly when Connecticut IDUs stopped sharing, the reason(s) they stopped sharing, and whether they purchased syringes from pharmacists. Similar results were reported in France where IDUs reported decreased sharing injection equipment after the prescription law in France was repealed in May 1987 (Lurie, Jones and Foley, 1998).

Most recently, Minnesota's Syringe Access Initiative became effective on July 1, 1998. Modeled after the Connecticut initiative in 1992, the Minnesota initiative allows individuals to purchase up to 10 syringes in pharmacies without a prescription. Also, the state drug paraphernalia statutes were repealed, making it legal for individuals to possess up to 10 unused syringes at one time. Pharmacist participation is entirely voluntarily. Under the new initiative, participating pharmacies are prohibited from openly displaying syringes or advertising their availability. HIV testing and prevention to customers is encouraged under this new statute. Most importantly, participating pharmacies must demonstrate that they support activities involving proper syringe disposal (i.e., the provision of informational brochures, used syringe collection containers, and needle exchange) (USCM, 1999). Other states have passed similar legislation, with New Hampshire, New York, Rhode Island, each passing legislation in 2000 allowing the provision of up to 10 sterile syringes without prescriptions to IDUs to help prevent HIV and other blood-borne pathogens (Coffin et. al, 2001).

Pharmacy Regulations and Practice Guidelines. In addition to drug paraphernalia laws and state prescription laws, pharmacy regulations established by pharmacy boards and state health agencies under state law may prevent pharmacists from providing syringes unless there is a lawful or valid medical purpose. Even if pharmacists at their own professional discretion or in "all instances" provide syringes without a prescription, they tend to follow certain procedures. Most pharmacies require additional information designed to screen out persons who do not have a reasonable justification to purchase a syringe. Additional requirements and/or pharmacy policies reported in the literature include picture identification; the person's name, address and/or telephone number; a card verifying diabetic status or injection drug use status; a confirmation from a doctor or another pharmacist of the person's diabetic status; or a log book with recorded syringe sales transactions. Other pharmacy policies include the requirement that the customer must listen to a safety message on the disposal of syringes, that the customer must be knowledgeable about his/her insulin doses, and that the customer is personally known by the pharmacist (Gleghorn, Glee and Vlahov, 1998; Case, Beckett and Jones, 1998).

Even though these regulations and guidelines may not be legally binding, they pose the threat of professional sanction, discouraging pharmacists from providing sterile syringes to known or suspected IDUs (USCM, 1999). Also, corporate or individual store policies may affect pharmacists' provision of sterile syringes. To date, 23 jurisdictions have pharmacy regulations or practice guidelines that affect the practice of pharmacists in the provision of sterile syringes with or without a required prescription to known or suspected IDUs (Gostin, 1998).

Texas Law. The state of Texas does not have syringe prescription laws prohibiting pharmacists from providing sterile syringes. Pharmacists can legally provide syringes without prescriptions. However, under Texas law, pharmacists may provide syringes, in their judgment, to customers/patients for "legitimate purposes" only (e.g., for diabetics). If pharmacists intentionally provide syringes for "non-legitimate purposes," pharmacists can face legal ramifications. Because of laws prohibiting the distribution of drug paraphernalia, it is currently illegal in Texas for a pharmacist to provide sterile syringes to a customer/patient if he/she knows that the customer will be using the syringe for a "non-legitimate purpose" (Gostin, et al., 1997). In the Texas Controlled Substance Act, drug paraphernalia includes "a hypodermic syringe, needle, or other object used or intended for use in parenterally injecting a controlled substance into the human body" (Texas CSA, 1989; Beasley, 1999). A person commits an offense if he/she knowingly or intentionally delivers, drug paraphernalia (i.e. syringes). Violation of the law is a misdemeanor subject to imprisonment of up to one year (Beasley, 1999). With regards to pharmacy practice, The Texas Pharmacy Act governs the practice of pharmacy in Texas. Therefore, The Texas State Board of Pharmacy has the power to enforce this act and all the laws that pertain to the practice of pharmacy. A pharmacist can be found guilty of engaging in "unprofessional conduct" if he/she violates any provision of the Texas Controlled Substance Act. According to the Texas State Board of Pharmacy, the board can enforce legal/professional sanctions against a pharmacist if he/she intentionally provides a syringe for the purpose of injection drug use. According to researchers at the Beasley School of Law (1999), "Dispensing sterile injection equipment to an IDU does not violate Texas law where the pharmacist does not and reasonably should not know that the patient intends to use the equipment to illegally inject drugs." Even though dispensing sterile syringes to known IDUs may violate Texas law, law analysts from the Beasley School of Law state that it is difficult to prove "intent" when providing syringes to known or suspected IDUs. The Beasley School of Law researchers also argue that drug paraphernalia laws do not and were not intended to regulate healthcare professionals practicing within their scope of practice. If drug paraphernalia laws were to apply to legitimate disease prevention activities (e.g., HIV and hepatitis), then it would be illegal to provide IDUs with bleach and alcohol pads for disinfecting equipment and drug injection sites that have become universally accepted measures in today's society. There is nothing in the Texas legislative history that indicates that the Texas Drug Paraphernalia Act was intended to interfere with the practice of healthcare professionals (Beasley, 1999).

Texas House Bill 288 from Representative Glenn Maxey (2001) was in legislature. Since current Texas law does not provide for the operation of harm reduction programs in Texas, House Bill 288 authorizes the establishment of local harm reduction programs (e.g., NEPs) via permission from local health authorities to prevent the spread of HIV and other blood-borne pathogens. The bill provided exceptions to certain offenses concerning the possession and delivery of drug paraphernalia if that person(s) is/are involved with a harm reduction program. House Bill 288 was tabled, and therefore, was not passed during the 2001 legislative session.

Needle Exchange Programs

Despite legal barriers, NEPs and other initiatives were implemented to make syringes readily available to known or suspected IDUs, stemming the relationship between the transmission of HIV/AIDS and unsafe injection drug practices. Such programs epitomize the notion of harm reduction, focusing on the immediate threat of HIV/AIDS within the IDU community rather than concentrating on a "drug-free society." The provision of sterile syringes by community pharmacists and NEPs operate under the notion that most people who cannot or will not stop injecting drugs will nonetheless take precautionary measures to reduce the risk of contracting HIV/AIDS.

The first NEP was established in Amsterdam in 1984 in an effort to prevent the spread of hepatitis B among the hard-to-reach IDUs, after pharmacists had decided not to sell syringes. Later, such groups were formed in Australia, Canada, Sweden, and the United Kingdom (Lurie et al., 1993). Despite the first U.S. public distribution of drug injection supplies in 1986, it was not until 1988 that the U.S. had its first fully operational needle exchange program in Tacoma, Washington (Lurie et al., 1993). Within the last two decades, the number of NEPs in the U.S. has risen dramatically. There are over 100 NEPs in the U.S. compared with more than 2000 in Australia. It is important to note that Australia's population is less than 10 percent of the U.S. population (CDC, 1998). It is estimated that over 10,000 infections world-wide could have been prevented since 1987 among IDUs. Thus, the provision of syringes via NEPs have become an integral part of a comprehensive public health strategy for reducing HIV transmission among IDUs around the world.

In November 1996, the Beth Israel Medical Center (BIMC) and the North American Syringe Exchange Network (NASEN) mailed surveys to the directors of 113 NEPs in the U.S. (Paone et al., 1998). Of the 100 respondents, 21 programs were new in 1995, 17 were new in 1996 and eight were new in 1997. Between 1996 and 1997, there was a 21.3 percent increase in the estimated number of IDUs attending NEPs.

Paone et al. (1998) reported that more than 17 million syringes were exchanged in 1997 in the U.S. Between 1994 and 1997, there was a 118 percent increase in the number of syringes exchanged. Modest estimates of the number of syringes needed to guarantee a sterile syringe for each injection show that a deficit of syringes still remains even though NEPs are closer to their goal than in past years. Using estimated frequency of injections, Paone and colleagues (1998) calculated a syringe deficit of 14 to 31 million syringes. In a study conducted in Montreal, Remis, Bruneau and Hankins (1998) found that less than five percent of the need for sterile syringes was met in that city, indicating that NEPs may not be enough to supply all IDUs with sterile syringes.

Effectiveness of NEPs and the Provision of Sterile Syringes to IDUs

A U.S. law enacted in 1988 bans the use of federal funds for NEPs until the programs are shown to reduce HIV transmission without leading to increased drug use. Funding, however, has been authorized by Congress to conduct research into the efficacy of such programs and to examine the impact of such programs on drug use. Eight government-sponsored studies have shown that NEPs meet these criteria, and the majority of scientific reviews have called for the ban to be lifted. On April 20, 1998, The Secretary of Health and Human Services, Donna Shalala, issued a determination that NEPs can be an effective part of a comprehensive strategy to reduce the transmission of HIV without losing the battle against illegal drug use (HHS, 1998). Unfortunately, the ban has not been lifted and federal funds continue to be restricted.

One reason that the ban has not been lifted is due to conflicting research regarding NEPs. Some studies supports the effectiveness of NEPs, others question their benefit to society. Between 1991 and 2000, eight important expert reviews of the scientific literature on NEPs have been commissioned by the federal government. Each report has concluded that NEPs are effective programs in providing access of sterile syringes to IDUs, that NEPs do slow the spread of HIV among IDUs, and that NEPs do not increase drug use (GAO, 1993; Lurie, 1993; National Academy, 1995; Day, 1999; IOM, 2001).

U.S. General Accounting Office (GAO) (1993). The GAO report in 1993, *Needle Exchange Programs: Research Suggests Promise as an AIDS Prevention Strategy*, was requested by the Chairman of the House Select Committee on Narcotics Abuse and Control. He asked (1) to review the results of studies addressing the effectiveness of NEPs in the U.S. and abroad, (2) to assess the credibility of a forecasting model developed at Yale University that estimates the impact of a NEP on the rate of new HIV infections, and (3) to determine whether federal funds can be used in support of studies and demonstrations of NEPs. A literature review was conducted examining over 20 published studies along with site visits to two needle exchange programs (Tacoma, Washington and New Haven, Connecticut). Nine NEP projects were reviewed regarding changes in syringe sharing behaviors. Only three of these NEP projects provided strong evidence, with two reporting a reduction in syringe sharing while a third reported an increase. Seven NEP projects were reviewed in regards to whether they led to increased injection drug use. Five projects had strong evidence indicating that drug use did not increase among IDUs. Using the forecasting model, researchers found that the model predicted a 33 percent reduction in new HIV infections over one year among New Haven NEP participants. While these findings suggest that NEPs may be effective as an AIDS prevention strategy, Health and Human Services (HHS) cannot use certain federal funds to support funding of NEPs. HHS, however, can continue to use funds for research involving NEPs.

National Commission on AIDS (1991). Researchers from the National Commission on AIDS prepared a full report over two years ago on the twin epidemics of substance use and AIDS. Through their hearings and site visits, the Commissioners had become concerned with the wide range and diverse nature of substance use. Concerned with behaviors that put individuals at risk for exposure to HIV and the impact the twin epidemics have had on communities of color, women and adolescents, the Commissioners offered five recommendations:

1. Expand drug abuse treatment so that all who apply for the treatment can be accepted into treatment programs. Continually work to improve the quality and effectiveness of drug abuse equipment.
2. Remove legal barriers to the purchase and possession of injection equipment. Such legal barriers do not reduce illicit drug injection. They do, however, limit the availability of new/clean injection equipment, and therefore, encourage the sharing of injection equipment, and the increase in HIV transmission.
3. The federal government must take the lead in developing and maintaining programs to prevent HIV transmission related to licit and illicit drug use.
4. Research and epidemiologic studies on the relationships between licit and illicit drug use and HIV transmission should be greatly expanded and funding should be increased, not reduced or merely held constant.
5. All levels of government and the private sector need to mount a serious and sustained attack on the social problems that promote licit and illicit drug use in American society.

University of California (1993). Prepared by the University of California at Berkeley and San Francisco for the Centers for Disease Control and Prevention (CDC), *The Public-Health Impact of Needle Exchange Programs in the United States and Abroad* project (Lurie et al., 1993) assessed the public health impact of needle exchange programs. Fourteen research questions were identified. Over 1,900 sources were reviewed, site visits to 15 cities with 23 NEPs were conducted, and 20 U.S. NEPs not visited during the project were surveyed using mail questionnaires. The researchers concluded that:

1. NEPS have continued to increase in number in the U.S.
2. U.S. NEPs offer a variety of services (e.g., condom and bleach distribution) even though funding is often unstable.
3. Some NEPs act as bridges to public health services particularly referrals to drug abuse treatment.
4. Annual budgets for U.S. NEPs is relatively low at approximately $170,000, with the largest cost component being personnel (66%). Syringe costs represent seven percent of the budget.
5. NEPs generally reach a group of IDUs with long histories of injection drug use who remain at significant risk for HIV infection.
6. Some NEPs appear to reach large proportions of the local IDU population while other NEPs do not. Other methods of increasing sterile syringe availability must be explored.
7. NEPs in the U.S. often encounter strong opposition from various communities.
8. There is no evidence that NEPs increase the amount of drug use by NEP clients or change overall community levels of non-injection and injection drug use.
9. U.S. NEPs have not been shown to increase the total number of discarded syringes.
10. NEP participants have reported decreased rates of HIV drug risk behavior, but not decreased rates of HIV sex risk behavior.
11. Limitations of using the testing of syringes as a measure of IDU behavior can be minimized by following syringe characteristics over time, or by comparing characteristics of syringes returned by NEP participants with those of nonparticipants of NEPs.
12. There is limited evidence that NEPs are associated with reductions in injection-related infectious diseases other than HIV/AIDS.
13. There is no clear evidence that NEPs reduce HIV infection rates, however, NEPs do not appear to be associated with increased rates of HIV infection.
14. NEPs can prevent significant numbers of infections among participants, their drug and sex partners and children.

National Academy of Sciences (1995). In July 1992, the National Academy of Sciences (1995) was requested to conduct a study of the impact of needle exchange and bleach distribution programs on drug use behavior and the spread of the HIV virus. In response to this request, the National Research Council (NRC) and the Institute of

Medicine (IOM) of the National Academy of Sciences organized an expert panel in 1993. After an extensive scientific literature review, the researchers published the report, *Preventing HIV Transmission: The Role of Sterile Needles and Bleach*, in 1995. The panel concluded that:

1. NEPs increase the availability of sterile injection equipment.
2. The lower the fraction of contaminated syringes in circulation, the lower the risk of new HIV infections.
3. There is no credible evidence that drug use is increased among NEP participants.
4. Based on self-reports, NEPs do not increase the frequency of injections among NEP participants and do not increase the number of new initiates to injection drug use.
5. NEPs have public support and that public support tends to increase over time.

Office of Technology Assessment (OTA) (1995). The sub-committee on Health and the Environment of the House of Representatives asked the Office of Technology in 1995 to examine the effectiveness of HIV prevention efforts. A key finding in this report was that the availability of sterile syringes does not increase the incidence of drug use. The researchers discovered that NEPs, along with drug detoxification and treatment, can play a crucial role in the reduction of HIV among IDUs.

National Institutes of Health (NIH) (1997). On February 13, 1997, the Consensus Development Conference convened on the NIH campus in Bethesda, Maryland to identify behavioral interventions that are effective with different populations in different settings for the two primary modes of HIV transmission, unsafe sexual behavior and unsafe injection practices. The expert panel found that the number of studies showing positive effects such as a reduction in syringe sharing greatly outnumbered those showing no effect. Therefore, the panel concluded that NEPs do not increase syringe use by IDUs, NEPs do not increase the overall number of IDUs, and NEPs do not increase the number of discarded syringes or drug paraphernalia in communities. The panel reported, "the evidence is unequivocal that consistent use of sterile injecting equipment is nearly 100% effective in protecting against HIV" (USCM, 1997). Strong evidence shows that NEPs are associated with either no change or a decrease in drug use, despite scattered cases showing increased drug use. Evidence shows no increases in new drug users after the implementation of NEPs. In the majority of studies reviewed by NIH, there was no increase in used syringes discarded in public places (NIH, 1997).

David Satcher, Surgeon General (2000). Scientists and public health experts within the Department of Health and Human Services compiled a review of recently published peer-reviewed research on NEPs, *Evidence-based Findings on the Efficacy of Syringe Exchange Programs: An Analysis of the Scientific Research Completed Since April 1998.* The researchers concluded that the new studies to date that have been reviewed contributed significantly to the existing data showing the following effects of NEPs:

1. NEPs contribute to a decrease in new HIV seroconversions among IDUs.
2. NEPs contribute to an increase in the numbers of IDUs referred to and retained in substance abuse treatment.
3. NEPs provide well-documented opportunities for multiple prevention services and referral and entry into medical care.
4. NEPs do not increase drug use among NEP participants.
5. NEPs contribute to a decrease in injection frequency among NEP participants.

The Surgeon General and researchers concluded that there is significant evidence that NEPs, as part of a comprehensive HIV prevention strategy, are an effective public health intervention that helps prevent HIV and other blood-borne pathogens and does not encourage drug use. The scientific evidence reviewed in this paper provides a basis on which communities that are significantly affected by the IDU-related HIV epidemic should consider NEPs as a tool to help prevent HIV and other blood-borne pathogens.

Institute of Medicine (IOM) (2001). The CDC requested that the IOM establish a committee to review current HIV prevention efforts in the U.S. The committee examined the available evidence and obtained useful information from federal, state, and local agencies involved in HIV prevention. From these findings, the committee suggested that the nation adopt the goal to "avert as many new HIV infections as possible with the resources available for HIV prevention" (IOM, 2001). To obtain this goal, the committee's strategic vision was comprised of the following six elements:

1. To develop an accurate surveillance system;
2. To allocate HIV prevention resources;
3. To direct HIV prevention services to HIV infected persons;
4. To translate findings from prevention research into action at the community level;
5. To invest in new tools and technologies; and
6. To strive to overcome social barriers.

Overall, the committee strongly recommended the removal of legal and policy barriers that limit access to sterile syringes. The committee believes that time is running out and the nation could do much more to prevent HIV infection among all risk groups. The researchers state that it will require moving obstacles that impede the implementation of harm reduction interventions that have been shown to be effective.

These expert-reviewed papers indicate that NEPs can have a positive impact on hard to reach populations by referring such individuals to drug treatment. NEPs can be a crucial component to a comprehensive strategy to prevent HIV/AIDS among IDUs. The studies by the National Commission on AIDS, the University of California, the Institute of Medicine, the National Academy of Sciences, and the National Institutes of Health

Consensus Panel recommended the revocation of the federal funding ban and state syringe prescription and drug paraphernalia laws. Overall, the unanimous conclusion of the eight reports was that NEPs reduce HIV transmission and do not increase drug use.

Despite the positive results of studies where NEPs have contributed to the reduced rates of HIV transmission among IDUs, the decrease in risk behaviors among IDUs, and the decrease in drug use among IDUs, other studies have revealed potential limitations of needle exchanges. Despite efforts by NEPs and pharmacy-based programs in Canada, HIV prevalence continues to rise (Hankins, 1998). Strathdee and colleagues (1997) conducted a study in Vancouver, British Columbia examining the prevalence and incidence of HIV, hepatitis C and risk behaviors among IDUs. Vancouver's NEP network is one of the largest in North America. Questionnaires were designed to collect demographic information, injection/non-injection drug use, needle and equipment sharing, re-use of one's own needle, syringe disinfection, needle sources, access to sterile syringes, NEP attendance, incarceration, housing, frequency of HIV testing, and drug treatment. Among 257 IDUs who tested HIV-negative at baseline and attended their first semi-annual follow-up visit, 24 seroconversions were confirmed, revealing an estimated HIV incidence of 18.6 per 100 person-years (95% CI, 11.1-26.0). HIV-positive IDUs were more likely to have attended a NEP, and to attend a NEP on a regular basis compared with HIV-negative IDUs. Using multiple logistic regression, the researchers found that behavior variables, commercial sex work, borrowing used needles, injecting with others, being an established IDU and attending a NEP more than once per week were all independently associated with HIV-positive serostatus. It is important, however, to note various limitations with the study. It is difficult to interpret a “casual” effect with NEPs and HIV prevalence since risk behaviors and exposure to HIV interventions could have changed following an HIV-positive diagnosis. Also, NEPs could attract higher risk IDUs. The authors suggest that long-term evaluation of NEPs is necessary to fully understand and measure the impact of NEPs in reducing HIV and other blood-borne pathogens among IDUs. Other studies have questioned the feasibility and practically of one-time use of sterile syringes to help prevent HIV (Gleghorn, Wright-De Aguero and Flynn, 1998; Remis, Bruneau and Hankins, 1998), with Remis and colleagues reporting that less than five percent of the need of one sterile syringe for each injection was being met via NEPs.

In another study conducted by Bluthenthal and colleagues (2001), IDUs were interviewed in Providence, Rhode Island to determine if frequent NEP attendance was associated with lower readiness to change drug use behavior. Readiness to change drug use was assessed using a nine-step decision ladder (a technique used successfully in other health behavior studies). Among the 168 IDUs enrolled in the study and analyzed in the study, the mean frequency of visits in the past six months to the NEP site was 24.7 (SD=28.6). According to the classification scheme, 14 percent of the respondents were precontemplators, 29 percent were in the contemplation stage, and 56 percent were in the determination stage or ready to change state. The researchers found that NEP attendance was not associated with readiness to change drug use (p=0.37). One can reach the conclusion that NEPs are neither enabling nor encouraging drug use.

Even though many more positive outcomes (results) of NEPs have been reflected in empirical research than negative outcomes, it is still important to report all outcomes when determining the effectiveness of NEPs. Such negative findings as the ones discussed in this paper have been controversial and have been discussed extensively in the U.S., with the authors claiming that the results have been misinterpreted.

Pharmacists' Involvement in the Provision of Sterile Syringes to IDUs

With NEPs not meeting the estimated need for sterile syringes, community pharmacists have become involved in the provision of sterile syringes to known or suspected IDUs. Throughout Europe, Australia and New Zealand, pharmacy-based programs are common and often operate more for the provision of sterile syringes than NEPs. Community pharmacists usually offer IDUs a choice of prepared packs sometimes including sharp containers, water bottles, condoms, alcohol swabs, HIV prevention pamphlets and bleach (Lurie, Jones and Foley, 1998). In 1991, 70 percent of pharmacists in Queensland supplied syringes to IDUs. Lurie and colleagues (1998) noted that although pharmacies abroad often provide sterile syringes separately, they are encouraged to provide IDUs with other items necessary for safer injection practices. Table 2.1 presents a comparison of five pharmacy kits in various countries.

Table 2.1 Pharmacy Kits Distributed to Injection Drug Users

Item	Australia	France	Netherlands	Spain	Switzerland
Name	Fitpack	Steribox	Basics Box	Anti-AIDS Kit	Flash Box
Container	Plastic	Cardboard	Plastic	Plastic bag	Cardboard
Disposal of used syringes	Section of Container	Section of Container	Section of Container	Plastic Housing	Container
Price*	$2.25; free if used pack returned	$1	$5	$0.50	$2
Needle/ syringe	3,5,10	2	2 1 separate needle	1	2 separate syringes 2 separate needles
Water bottle	0	1	2	1	0
Condoms	0	1	0	1	1
Alcohol Swabs	0	2	4	2	2
HIV prevention pamphlet	None	On box	Yes	Yes	Yes
Bleach	0	0	0	0	0
Other	None	1 cotton	Vitamin C Spoon	None	Vitamin C 2 dry swabs

*all prices given in U.S. dollars

Source: Lurie, Jones and Foley (1998)

All kits sell for five or less U.S. dollars. Interestingly, most kits generally contain only a few syringes despite the mounting evidence of a limited supply of sterile syringes for each injection. Unlike U.S. pharmacy-based programs, some European countries also have installed vending machines that sell or exchange syringes. Vending machines provide 24-hour access to sterile syringes (Lurie, Jones and Foley, 1998).

Prior to the opening of a pharmacy-based NEP in Baltimore, Maryland, the only pharmacy-based NEP in the U.S. was in Tacoma, Washington (Lurie, Jones and Foley, 1998). Unlike European and Australian pharmacists, Gleghorn, Gee and Vlahov (1998) found evidence of differential community pharmacy support for NEPs and pharmacy sterile syringe distribution to known or suspected IDUs. Even though most community pharmacists in Baltimore City supported the concept of NEPs, there was diversity in the provision of nonprescription sterile syringes in Baltimore City, a city without syringe prescription laws. Even though prescription laws do not prohibit the provision of sterile syringes to IDUs, many community pharmacists in Baltimore City provided sterile syringes at their own discretion. More than half of the community pharmacists engaged in restrictive sales practices, making it difficult for IDUs to obtain sterile syringes.

Use of Sterile Syringes by IDUs

IDUs can obtain syringes from a variety of sources, including pharmacies, NEPs, diabetics, drug dealers, friends, and shooting galleries. One study conducted by Gleghorn, Wright-De Aguero and Flynn, (1998) examined the sources of syringes, syringe use and reuse, and barriers to and facilitators of compliance with one-time uses of syringes by IDUs. The survey was administered in seven U.S. metropolitan cities to 593 active IDUs. Overall, less than one-fourth of the respondents (23%; N=135 out of 588) obtained their most recent syringe from a source where the syringe could reliably be considered sterile (i.e., pharmacy or NEP). Over 80 percent (N=494 out 588) of the respondents obtained their most recent syringe from their usual source, however, "usual source" was not identified. Reasons for syringe reuse given by IDUs included nothing wrong with the syringe (24%), no need to use a new syringe (19%), no source for obtaining a new syringe (16%), no money to pay for a new syringe (14%), and lack of availability of a new syringe (14%). Approximately, one-fourth of the respondents (26%, N=152 out of 583) indicated that needle dealers provided them with their most recent syringe followed by diabetics (21%), pharmacies (12%), and NEPs (11%). Facilitators for one-time use of syringes included free syringe (50%), access to NEP (38%), purchase syringe in pharmacies (24%), and elimination of prescription (10%). The results suggest that legal restrictions, finances and accessibility pose important barriers to preventing HIV/AIDS among IDUs.

IDU Opinions and Practices

If sterile syringes were to become more widely available to IDUs through pharmacies, would IDUs purchase them in pharmacies? Would IDUs be willing to pay for sterile syringes and, if so, how much? A number of studies on the opinions/beliefs and practices of IDUs shed light on these questions.

Evidence suggests that if all legal barriers were removed a significant number of IDUs would obtain some or all of their syringes in pharmacies. The most extensive evidence comes from Connecticut. After the prescription and drug paraphernalia laws were amended by loosening restrictions on nonprescription sales and possession of syringes in Connecticut, the proportion of IDUs who reported that they obtained syringes in pharmacies increased significantly. For example, Groseclose and colleagues (1995) conducted a study to determine whether the simultaneous, partial repeal of syringe prescription and drug paraphernalia laws in Connecticut affected the purchasing and usage of syringes by IDUs. Two survey questionnaires were administered, one before the new laws were enacted and one after the new laws were enacted. The questionnaire assessed IDUs' syringe-purchasing practices, their syringe-sharing behaviors, and their knowledge of the new syringe legislation. Fewer IDUs (N=124) participated in the initial survey than in the follow-up survey (N=134). Fewer IDUs reported purchasing syringes on the street after the new laws went into effect (74% before versus 28% after; $p<0.0001$). The proportion of IDUs who reported purchasing at least one syringe from a pharmacy after the enactment of the new laws was 78 percent (versus 19% before the new laws). Also, after the new laws, more IDUs reported obtaining syringes from NEPs in Connecticut (3% before versus 11% after; $p=0.01$). However, the percentage of IDUs reporting that they always carried syringes with them after the new laws did not increase significantly. Another study conducted in Connecticut found that 72 percent (N=850) of IDUs reported buying at least some of their syringes from a pharmacy, and of these, 41 percent reported buying all of their syringes from pharmacies (Singer et al., 1998).

Economic Analysis

Risk behaviors among IDUs are associated with substantial morbidity and mortality (Miller and Pisani, 1999). HIV/AIDS resources in the developing world are estimated to be at least $7 to $10 billion annually (Kates et al., 2002). The cost of treating one person with AIDS from the onset of HIV to death is about $119,000. Therefore, the cost to society of treating the 25,000 cases of injection drug-related cases in 1995 would cost over $3 billion. For those unfortunate individuals infected with AIDS who have access and the financial means to obtain new combination AIDS medications, the costs of medications alone is estimated to be about $12,000 per year (Day, 1998). Therefore, providing programs such as NEPs and pharmacy-based programs that would allow IDUs easy access to sterile syringes would make it possible for individuals to avoid getting HIV/AIDS. This would save lives as well as money. Lurie and Drucker (1997) estimated that between 1987 and 1994 a range from 4,400 to 9,600 HIV infections could have been prevented if NEPs had been established during this period, with 88 percent of these among IDUs, and the remainder among their sexual partners and children. Not preventing HIV/AIDS among IDUs could cost the U.S. healthcare system up to $538 million as a result.

Studies have found that NEPs and pharmacy-based programs are cost effective when compared to lifesaving interventions (Lurie et al., 1998b; Holtgrove et al., 1998). Lurie and researchers (1998b) estimated the cost per syringe provided by five syringe distribution strategies: (1) NEP, (2) a pharmacy-based NEP, (3) free pharmacy distribution of pharmacy kits, (4) sale of pharmacy kits to IDUs, and (5) sale of syringes in pharmacies. Findings revealed that the cost per syringe was $0.97 for the NEP, $0.37 for the pharmacy-based NEP, $0.64 for the pharmacy kit distribution, $0.43 for the pharmacy kit sale and $0.15 for the syringe sale in pharmacies. The total annual cost of providing 50 percent of the syringes needed for a single syringe for every injection ranged from $30,000 to $40 million depending on the need for various cities. Even though all strategies were cost-saving to society, NEPs would be the most expensive and syringe sales in pharmacies would be the cheapest. Interestingly, all pharmacy-based options were less costly than the NEPs. It is important to note the study is not without limitations, including the possible overestimation of the effectiveness of a syringe distribution program, the assumption of unlimited NEP and pharmacy capacity, the assumption of no start-up costs and the assumption that no increase in drug use is related to NEPs or pharmacy distribution.

Holtgrove and colleagues (1998) determined the cost of increasing access of IDUs to sterile syringes as an HIV preventative measure in the U.S. as well as the cost per HIV infection averted by such programs. It was estimated that $423 million would cover the costs for NEPs, pharmacy sales, and syringe disposal to cover all IDUs for one year. One-third of the costs would be out-of-pocket expenses for IDUs. On average, the cost would be approximately $34,000 per HIV averted, a cost well under the lifetime costs of a person with HIV/AIDS. Even though the cost to provide wide-spread access to sterile syringes to known or suspected IDUs may seem high, the cost saving to society in averting HIV infections (over 12,000 per year) is pivotal.

Levels of Support

With an abundance of evidence showing the positive impact of NEPs and increased availability of sterile syringes through pharmacies, why is this area of research so controversial? Drug use is generally viewed as harmful not only to individuals who use drugs but to society as well. Until recently, the U.S. "war against drugs" has primarily focused on abstinence (e.g., "Just say no" campaign). Zero-tolerance approaches disapprove of interventions such as sterile syringe distribution. Presently, The Office of National Drug Control Policy (ONDCP) and other federal agencies have done little to address this health problem. The National Commission on Acquired Immune Deficiency Syndrome reports that "the federal government must recognize that HIV and substance use is one of the issues of paramount concern within the 'war on drugs.' Any program which does not deal with the duality of the HIV/drug epidemic is destined to fail" (National Commission, 1991).

Opponents to NEPs and the availability of sterile syringes in pharmacies feel that these public health programs give the wrong message. Opponents of NEPs primarily object on ideological grounds. Most notable and outspoken on this topic is the former Governor of New Jersey, Christine Whitman. As a mother and a former governor, she strongly feels that such initiatives will send children the wrong message, suggesting the idea of "just say maybe" (Whitman, 1998). After a review of the scientific evidence, Ms. Whitman stated in a letter to the editor of the *Trenton Times* in New Jersey, "I, however, do not view this solely in terms of science, but also in legal, public policy and philosophical terms" (Whitman, 1998).

Reverend Michael Orsi, a member of the Governor's Advisory Council convened by Ms. Whitman, publicly states that NEPs undermine society by increasing taxes, not realizing the root of the problem and sending mixed messages (Orsi, 1998). Interestingly, former Governor Whitman and Reverend Orsi do not see any need for IDU-related harm reduction strategies despite New Jersey ranking in the top 10 for states with high prevalence rates of IDU-related HIV/AIDS.

On the other end of the spectrum, proponents of NEPs and sterile syringe access though pharmacies feel that the programs bridge a gap between drug communities and service organizations. Those who support harm reduction programs cite the importance of the programs with regards to counseling, education, and treatment referrals. Harm reduction initiatives are viewed as reaching out to users and are supported on community, state, and national levels. Supporters of such programs maintain that drug users have some control and are willing to modify behaviors due to IDUs' high level of participation in NEPs (CCSA, 1994).

Personal input from the community is crucial to establishing community-based programs such as NEPs. Community support is important if harm reduction programs are to be utilized effectively. In October 1995, Keyl et al. (1998) assessed community beliefs/opinions toward NEPs in Baltimore, Maryland where more than 50 percent of AIDS cases are associated with intravenous drug use. Keyl and colleagues conducted a household survey using in-person interviews to ascertain beliefs/opinions toward NEPs and pharmacy sale of syringes without prescriptions. Interviews were conducted one year after the opening of the Baltimore NEP. Nearly half (47 percent; N=138) of the respondents thought that NEPs would decrease the number of discarded needles on the street and 57 percent thought that NEPs would decrease the number of new cases of HIV. However, 72 percent of the respondents felt that NEPs would attract IDUs to the neighborhood. Interestingly, both opponents and proponents of NEPs thought that NEPs would attract IDUs to the neighborhood. Overall, 65 percent of the respondents favored NEPs in Baltimore and 47 percent favored the provision of sterile syringes without a prescription in pharmacies. Respondents who favored NEPs were more likely to agree to statements that NEPs would decrease the number of discarded needles and that NEPs would decrease the number of new cases of HIV.

NEPs have been endorsed by many influential organizations. State level support for syringe access through pharmacy is mounting (English, 2000). In 1992, a nationwide survey found moderate support for the repeal of prescriptions and paraphernalia laws from state pharmacy board leaders and state pharmacy association executives. In addition, limited support for pharmacist participation in the sale, exchange or distribution of syringes to IDUs was reported. According to the United States Conference of Mayors *AIDS Information Exchange* report, the Washington State Board of Pharmacy formally adopted a resolution stating, "It considered the distribution of sterile syringes for the purpose of reducing the transmission of blood-borne diseases a legal intended use" (USCM, 1999). Since then, the following national organizations want sterile syringes to be more widely accessible and have adopted policies related to pharmacy sale of syringes (Anderson et al., 1999; Cohen, 1999; USCM, 1999):

Association of State and Territorial Health Officials (ASTHO) (1995)
ASTHO feels that states should investigate the removal of modification drug paraphernalia and prescription laws.

National Alliance of State and Territorial AIDS Directors (NASTAD) (1997)
NASTAD asks state and local legislative bodies to increase availability of sterile syringes through NEPs, to deregulate drug paraphernalia laws, to increase access to sterile syringes through pharmacies, and to increase access to drug treatment programs.

American Medical Association (AMA) (1997)
The AMA strongly encourages state medical associations to initiate state legislation to change drug paraphernalia and prescription laws. The AMA encourages NEPs and enthusiastically supports legislation in revoking the 1988 federal ban on funding for NEPs.

American Pharmaceutical Association APhA (1999)
APhA encourages state legislatures and boards of pharmacy to revise laws and regulations to allow the provision of sterile syringes without prescriptions by a pharmacist in an effort to prevent the transmission of blood-borne diseases.

AMA, APhA, ASTHO, NASTAD, and the National Association of Boards of Pharmacy (NABP) passionately feel that harmonized effort of state leaders in pharmacy, public health, and medicine are needed to embark upon access to sterile syringes. Other scientific medical groups who support NEPs and the provision of sterile syringes via pharmacies include the American Academy of Pediatrics, American Nurses Association, American Psychiatric Association, American Society of Addiction Medicine, California Medical Association and the National Institutes of Health Consensus Development Conference. The American Public Health Association encourages the U.S. national government to take “positive steps” to support NEPs, and urges state and local governments to revoke or modify current drug paraphernalia and prescription laws and to ensure such public health initiatives complement drug treatment programs. Legal group supporters include American Bar Association and National Association of County and

City health Officials. Social groups supporting the access of sterile syringes include the National Association for the Advancement of Colored People, Mothers' Voices, and the National Association of Social Workers (DRCNet, 2000). The CDC is so convinced of clean-needle programs that it had set the goal of having 50 percent of all persons who inject drugs using clean needles by the year 2000 (HHS, 1995). With many local, state, and national organizations supporting the provision of sterile syringes to IDUs, it is not clear as to why the U.S. is far behind the world in revoking syringe prescription and drug paraphernalia laws and establishing effective NEPs and pharmacy-based programs to help prevent HIV and other blood-borne pathogens among the IDU population.

Pharmacists' Role in HIV/AIDS Prevention and Treatment

Even though local, state, and national organizations support pharmacy-based community programs, such programs will not be effective if pharmacists are not willing to provide sterile syringes to known or suspected IDUs. In order to examine community pharmacists' willingness to provide sterile syringes to known or suspected IDUs to help prevent the spread of blood-borne pathogens, it is important to first review the literature regarding the pharmacist's role in HIV/AIDS prevention and treatment strategies. Most of the research concerned with the role of the pharmacist in relation to HIV/AIDS has been directed toward clinical services that the pharmacist provides when a prescription is dispensed rather than toward preventative roles.

Much of the literature has focused on counseling issues. Research in the HIV/AIDS arena has primarily addressed the pharmacist's role in adherence strategies

(Lowers, 1997; Tseng, 1998; Remien, 1998; Blake, 1999). Since HIV/AIDS infection is often associated with sexual behavior and intravenous drug use, prejudice against certain patient populations may exist. As for the profession of pharmacy, attitudes of pharmacists toward certain populations such as homosexuals and intravenous drug users may affect the quality of pharmaceutical care provided. How do pharmacists view their expanded role within the world of HIV/AIDS? How do pharmacists feel about HIV/AIDS and intravenous drug use? Are pharmacists willing to provide sterile syringes to known or suspected IDUs to help prevent the spread of blood-borne pathogens (e.g. HIV and hepatitis)? A few studies found in the HIV/AIDS literature have shed some light on pharmacists' opinions/beliefs regarding HIV/AIDS education and prevention services. However, several international and domestic studies have focused specifically on pharmacists' opinions/beliefs pertaining to HIV/AIDS and intravenous drug use.

Pharmacists' Opinions, Levels of Comfort, Levels of Preparedness and Knowledge About HIV/AIDS. The literature shows that most pharmacists take a positive view of the pharmacist's role in HIV/AIDS education and preventative services. In order to mobilize pharmacists as information resources for HIV/AIDS education and prevention services, two similar U.S. studies were conducted to assess pharmacists' opinions and knowledge about HIV/AIDS. In the early 1990s, Binkley and associates (1995) surveyed 1,512 Alabama pharmacists. The objectives of the mail survey were (1) to establish a baseline of knowledge and attitudes among Alabama pharmacists about HIV/AIDS, (2) to assess pharmacists' willingness to assume the role of HIV/AIDS resources, and (3) to identify perceived barriers to assuming such a role in the community. The sample size of N=1512 had a mean age of 43±13.7 years with 66 percent male and 34 percent female. Binkley and colleagues found that a majority of pharmacists had generally open and positive opinions toward a variety of HIV/AIDS education and prevention issues. Over 88 percent (N=1337 out of 1512) of the respondents felt prepared to advise consumers in the area of HIV/AIDS prevention and transmission. Over 90 percent of the respondents appeared willing, if not very willing, to participate in HIV/AIDS prevention and education activities such as providing clients with informational materials or attending an HIV/AIDS introductory course. However, the more effort required to participate in the activity, the smaller the number of pharmacists willing to participate. Findings showed that pharmacist's perceptions of preparedness in the various HIV/AIDS subject areas (i.e. prevention, transmission, testing, and treatment) seem to match their actual knowledge on specific items of the survey instrument. For example, Alabama pharmacists who reported low levels of preparedness regarding HIV/AIDS testing and treatment, also reported low levels of knowledge regarding HIV/AIDS testing and treatment.

Modeled after the study by Binkley et al. (1995), Katz, Draugalis and Lai (1995) surveyed 199 Arizona pharmacists to assess the knowledge and opinions of HIV/AIDS. The mail questionnaires addressed the following: (1) pharmacy practice; (2) beliefs about the pharmacist's role in HIV/AIDS prevention; (3) preparedness in providing HIV/AIDS information; (4) comfort issues in discussing sensitive issues; (5) willingness to participate in HIV/AIDS education and prevention activities; (6) knowledge about HIV/AIDS covering a variety of content areas; and (7) demographic items. The sample size of N=199 had a mean age of 43±11.7 years with 59 percent male and 41 percent female. Despite low levels of HIV/AIDS-related activity, high levels of preparedness and comfort levels were reported, with pharmacists strongly agreeing (75 percent, N=149 out of 199) that providing HIV/AIDS information is part of a pharmacist's responsibility. The majority of respondents (92 percent, N=183 out of 199) were willing if not very willing to provide HIV/AIDS educational services despite low knowledge scores. Results of this study were similar to the results found in a five year update (Jordan, Katz, and Draugalis, 2000) with the most noticeable difference in knowledge level (1995 study – 57.7 percent correct; 1998 study – 50 percent correct). Jordan, Katz and Draugalis (2000) reported a need for more continuing education programs about HIV/AIDS.

Both Alabama and Arizona pharmacists reported high levels of preparedness regarding HIV/AIDS prevention and treatment and high levels of comfort regarding patient interaction. Unlike the findings from the Binkley et al. (1995) study, Katz, Draugalis and Lai (1995) reported a weak correlation (r=0.373) between total preparedness and knowledge. Overall, the results indicate that Alabama and Arizona pharmacists feel prepared, are comfortable, have positive opinions and are willing to provide HIV/AIDS-related services despite low knowledge scores.

In a nationwide Canadian study targeting community pharmacy managers, Cockerill and colleagues (1996) examined the role of the Canadian pharmacy and HIV/AIDS. The unit of analysis in the mail and telephone survey for this study was the pharmacy (i.e., the owner or manager of the pharmacy.) Two objectives of the survey were to assess attitudes and issues regarding HIV/AIDS and to assess the feasibility of community pharmacists to partake in HIV/AIDS prevention strategies. As found in the existing literature, researchers found that the majority of respondents were more knowledgeable of prevention strategies than standardized treatments. Only 46 percent (N=1,976) of respondents were aware of whether or not a position statement of their provincial licensing body existed. The majority of pharmacists (over 50 percent) were supportive of providing pamphlets on HIV, counseling on HIV, and providing referrals, while less than 21 percent were not supportive of providing bleach kits or on-site needle disposal units. Respondents from the previous studies appear to be comfortable interacting with homosexuals and heterosexual consumers. As a whole, pharmacists were not supportive of providing syringes to known or suspected IDUs. The issue of providing sterile syringes to known or suspected IDUs appears to be more controversial.

Pharmacists' Opinions and Comfort Levels Toward HIV/AIDS and Injection Drug Users. Research has shown that although pharmacists generally have positive opinions toward the expanded role of the pharmacist in HIV/AIDS prevention services, pharmacists often express mixed or controversial opinions toward HIV/AIDS and intravenous drug use. Pharmacists tend to view IDUs in a negative light (Binkley et al., 1995; Katz, Draugalis and Lai, 1995; Cockerill et al., 1996, Sheridan and Barber, 1997), affecting pharmacists' involvement in the provision of sterile syringes to known or suspected IDUs. Pharmacists have voiced their concerns about the unfairness to diabetics and to other needle users if drug users were to obtain the supplies free of charge (Cockerill et al., 1996). Binkley and associates (1995) found that over one-half of the Alabama pharmacists surveyed believed that people who are informed about HIV transmission via contaminated needles would not change their risky behaviors. Eighteen percent of the Alabama pharmacists also agreed that some people who have AIDS deserve to have the disease. Results from the Katz, Draugalis and Lai (1995) study regarding IDUs showed that 59 percent of the respondents from Arizona believed that people who are educated about how HIV is transmitted via contaminated needles would not change their risky behavior. Thirteen percent of the Arizona respondents agreed that "some people who have AIDS deserve to have AIDS" (Katz, Draugalis and Lai, 1995). Katz, Draugalis, and Lai (1995) reported that pharmacists in practice for 16 years or more had a significantly ($p=0.0009$) higher level of agreement that people with HIV/AIDS deserve to have the disease than those practicing 6 to 10 years and 11 to 15 years. Such results suggest that age may have an impact on pharmacists' opinions. The term, "some people" was not specifically defined for either the Alabama or Arizona study.

When reporting comfort levels on a 6-point Likert-type scale with 1 being "strongly disagree" and 6 being "strongly agree," Arizona pharmacists reported generally high comfort levels in answering questions about HIV/AIDS, answering questions about the use of condoms and spermicide, and filling/counseling prescriptions for heterosexual, homosexual, and hemophiliacs with HIV/AIDS. Comfort levels ranged from 4.98 ± 0.88 (answering adult male questions about the use of condoms and spermicide) to 5.28 ± 0.71 (filling/counseling prescriptions for hemophiliacs with HIV/AIDS). However, Arizona pharmacists were less comfortable, with comfort levels of 3.28 ± 1.60 and 3.53 ± 1.69 when asked if they agreed to the statements, "As a means of preventing the spread of HIV infection, I would be comfortable selling needles to individuals who inject illegal drugs" and "As a means of preventing the spread of HIV infection, I would be comfortable telling individuals who inject illegal drugs how to clean needles and syringes," respectively. Such responses imply that pharmacists' opinions/beliefs toward IDUs could impact pharmacists' HIV/AIDS-related services. This is supported in Jordan, Katz, and Draugalis's (2000) five year update study where pharmacists reported a higher comfort level (4.92 ± 1.11) filling/counseling prescriptions for an IDU who has AIDS than selling needles to known or suspected IDUs as a means of preventing the spread of HIV infection (comfort level = 3.44 ± 1.71).

In Canada, many pharmacists were apprehensive to participate in HIV prevention programs targeting IDUs despite the country's more liberal stance toward HIV and injection drug use (Cockerill et al., 1996). Close to 70 percent (N=1,976) of the respondents in the national Canadian survey reported that their own opinions toward drug use in the era of AIDS had become more tolerant. However, 18 percent indicated they were less tolerant while 14 percent suggested they were more confused. Mixed attitudes can be supported in other research where pharmacists have suggested an "uncomfortableness" in the provision of services for known or suspected IDUs such as selling sterile syringes (Wright-De Aguero et al., 1998) or counseling patients on how to clean needles and syringes used for illegal activities (Binkley et al., 1995). This negative view toward IDUs is in contrast to pharmacists' somewhat high comfort levels in working with heterosexuals, homosexuals and hemophiliacs, according to Katz, Draugalis and Lai (1995).

Although much less attention has focused on attitudes towards IDUs, recent studies suggest IDUs are perceived very negatively by other healthcare professionals. Studies have reported a decline in willingness to treat persons with AIDS among healthcare workers due to homophobia and/or an aversion to intravenous drug use. Overall this suggests that healthcare professionals' willingness to help persons with AIDS may be due to their own personal judgements of that person's responsibility for contracting HIV/AIDS. In 1987, Kelly and colleagues (1987) reported that physicians were much less willing to interact with gay men with AIDS even on a casual basis compared to leukemia patients with AIDS. Yedidia, Berry and Barr (1996) reported IDU-phobia and cynicism as having the strongest negative impacts on willingness to treat persons with AIDS among medical school graduates/residency trainees. The literature shows that pharmacists are not alone in the stigmatization of IDUs among healthcare professionals. Similar attitudes were found among nurses. In two separate studies, nursing students (West et al., 1996) and nurses (Gillispie and Davis, 1996) reported less favorable attitudes toward intravenous drug use-related AIDS compared to heterosexual, homosexual, blood transfusion and maternal-related AIDS cases. HIV patients infected via sexual contact and intravenous drug use were more likely to be blamed for their condition and seen as having significantly less moral integrity, among 135 healthcare workers in a study conducted by Hunter and Ross (1991). In general, healthcare workers were less likely to engage in personal interactions with IDUs compared to other persons with HIV/AIDS.

Among healthcare professionals in general, no consistent relationship has been found between gender and attitudes. Horsman and Sheeran (1995) contribute such findings to the fact that it is often difficult to separate sex from occupational and educational differences. Despite Horsman and Sheeran's (1995) rationalization, female respondents appeared more tolerant toward HIV/AIDS with a significantly greater proportion of female pharmacists stating they would be comfortable filling prescriptions for HIV/AIDS patients as well as from heterosexuals, homosexuals, and IDUs reported in the Binkley et al. (1995) study. One possible explanation is that female pharmacists are more likely than male pharmacists to prioritize patient care over business (Myers et al., 1998).

Personal Discretion Among Pharmacists in the Provision of Syringes Without Prescriptions. Even though prescription and drug paraphernalia laws play a pivotal role in pharmacists' intentions to provide sterile syringes to known or suspected IDUs, they are not always the deciding factor (USCM, 1999; Compton et al., 1992). Store policies and national endorsements may also influence a pharmacist's decision. However, even in situations free of external influences or hindrances, the provision of sterile syringes to known or suspected IDUs is still not a routine practice. Even without federal and state regulations, various pharmacy requirements and procedures concerning the provision of syringes without prescriptions to known or suspected IDUs suggest that the pharmacist's personal opinions may determine whether or not sterile syringes are provided (Binkley et al., 1995; Wright-De Aguero et al., 1998; Case, Beckett and Jones, 1998).

In states or countries with “relaxed” or repealed prescription laws, 54 to 87 percent of surveyed pharmacists tend to sell syringes without a prescription only at their own personal discretion rather than sell in an “all instance” or a “no sell” policy (Cockerill et al., 1996; Wright-De Aguero et al., 1998; Gleghorn, Gee and Vlahov, 1998).

Myers and associates (1996) conducted an analysis with the results from the Canadian study and found a significant relationship between syringe sales and actual provincial territorial policy towards the sales (χ^2=100.2, df=9, p=0.000). For example, the lowest sales were reported in British Columbia, the only province where providing syringes without prescriptions is illegal. Consequently, pharmacists in provincial jurisdictions where the provision of syringes without prescriptions is illegal appeared less willing to provide sterile syringes to nondiabetics.

Since 1992, Connecticut pharmacists have been permitted to sell up to 10 sterile syringes per purchase without a prescription (Weinstein and Wright-De Aguero, 1998). Using a cross-sectional design, Weinstein and Wright-De Aguero (1998) surveyed 329 Connecticut pharmacy managers and found that over three-fourths of surveyed pharmacy managers sold syringes and continued to sell syringes over-the-counter. Over half of the respondents permitted syringe sales at the pharmacists’ discretion, while only one-third reported selling syringes in “all” instances. Eighty percent of pharmacy managers who sold in “all” instances and 75 percent of pharmacy managers who at least sold syringes in “some” instances agreed that the sale of syringes without a prescription was a crucial part of a comprehensive approach to HIV prevention. However, of the 53 percent of pharmacy managers who permitted syringe sales at the pharmacist's discretion, 18.8 percent were "very willing" to sell syringes to IDUs.

Gleghorn, Gee and Vlahov (1998) measured community pharmacy managers' (N=46) reactions to the opening of the Baltimore Needle Exchange Program via a telephone survey in Baltimore, Maryland, a city without needle prescription laws. While 78 percent of the pharmacy managers surveyed were strongly or somewhat supportive of the needle exchange program, 67 percent of the pharmacy managers surveyed were strongly or somewhat supportive of the provision of sterile syringes to known or suspected IDUs in pharmacies. In support of NEPs, the researchers state that although there were no significant differences between pharmacy managers who did or did not require prescriptions or diabetic identification for syringes, there was diversity in opinions between the two groups regarding the support of pharmacy sales of syringes without prescriptions. Ninety percent of pharmacy managers who did not require prescriptions or diabetic identification for syringes strongly or somewhat supported the sale of syringes without prescriptions, while only 56 percent of pharmacy managers who did require prescriptions or identification strongly or somewhat supported the sale of syringes without prescriptions. With one-third of the pharmacy managers who were surveyed not supporting the sale of syringes without prescriptions and one-half of the pharmacy managers who were surveyed engaging in practice prohibiting the sale of syringes without prescriptions, results show that pharmacy managers use a great deal of discretion when providing syringes to IDUs.

Results from a telephone survey conducted in Maine (Case, Beckett and Jones, 1998) revealed that almost half of the surveyed pharmacy managers (47%; N=90 out of 208) were personally supportive of the new law in 1993 that allows but does not require Maine pharmacists to dispense sterile syringes without a prescription to anyone 18 years of age or older. Results showed that, although 94 percent of pharmacy managers were willing to sell syringes without prescriptions, 73 percent were willing to sell sterile syringes only at the discretion of the pharmacist while 22 percent were willing to sell syringes in all cases. When asked whether they would sell syringes to suspected IDUs, 43 percent of the respondents said no, again suggesting negative attitudes toward IDUs. It is important to note that Maine repealed its prescription law regulating the sale of syringes three years prior to the conduct of this study. However, during the conduct of the study, Maine's drug paraphernalia laws made it a criminal offense to possess syringes unless authorized by law, and thus, possibly negatively influencing pharmacists' decisions to sell syringes without prescriptions to IDUs.

On the contrary, the provision of syringes without prescriptions to suspected IDUs is more widely accepted in other countries, including Amsterdam, Australia, Canada, England, and New Zealand (Sloan, 1989). In England, the Royal Pharmaceutical Society of Great Britain "relaxed" their policy on the sale of injection equipment in 1986 in response to the spread of HIV/AIDS among IDUs. Almost 10 years later, Sheridan and Barber (1997) examined community pharmacists' attitudes and their involvement solely in service provision to IDUs. In a country where pharmacists' decision to sell syringes is left to their own professional discretion, the pool of willing suppliers (74%) in 1995 (currently selling or willing to sell) remained constant compared to the pool of willing suppliers (74%) in 1988 (Sheridan et al., 1996). Despite continuing support for the provision of sterile syringes to known or suspected IDUs, the pool of pharmacies willing to participate in needle exchange remains unchanged since 1988 at 55 percent (Sheridan et al., 1996).

Factors Influencing Pharmacists' Decisions to Provide Sterile Syringes to IDUs

Factors Affecting Attitudes. Attitudes toward HIV/AIDS and intravenous drug use are affected by a number of factors according to recent research. In 1994, Sheridan and Barber (1997) developed a mail questionnaire to investigate current practices and the level of involvement of community pharmacists in all aspects of services to drug misusers (including IDUs) as they relate to the prevention of the spread of HIV/AIDS. The two researchers examined the relationships between practice experience, attitude and service provision. Targeting community pharmacists in two North London Family Health Service Authorities, Sheridan and Barber (1997) found that 80 percent of respondents (N=123 out of 153) believed that "supplying injecting equipment to drug misusers showed a positive attitude to healthcare." However, there was evidence that respondents tended to negatively stigmatize IDUs. As supported in previously mentioned research (Katz, Draugalis and Lai, 1995), Sheridan and Barber (1997) found that this tendency was greater the longer the respondent had been employed as a community pharmacist. Pharmacists with more community experience tended to blame HIV-infected IDUs. A substantial minority (21%) of respondents preferred not to deal with AIDS patients, if given a choice. One-half of the respondents believed that IDUs caused "disruption" in the pharmacy and that pharmacists should not be obliged to provide services to IDUs. It is interesting to note that while pharmacists held positive beliefs toward their involvement in IDU-related HIV/AIDS preventative services, many held negative beliefs toward IDUs. Overall, pharmacists providing HIV/AIDS-related services had more positive attitudes toward HIV/AIDS and drug misuse compared to non-providers. Professional experience also was shown to be significantly related to a more positive attitude toward service provision (e.g., dispensing controlled drugs, selling injection equipment and providing needle exchange). The longer the pharmacist worked in a community setting, the more positive beliefs towards service provision, and to the contrary, the more stigmatization of IDUs and persons with HIV/AIDS.

In another study, Sheridan et al. (1997b) examined the relationships between pharmacists' beliefs and their involvement in IDU-related HIV/AIDS preventative services. Results indicated that those pharmacists already providing such services (i.e., sterile syringes and needle exchange) held significantly more positive beliefs toward the pharmacist's role in HIV/AIDS prevention and the provision of sterile injection equipment than non-providers. This is supported in other research where pharmacists who presently perform expanded services perceive themselves as more willing and able to do so than non-providers (Zelnio, Nelson and Beno, 1984). Sheridan et al. (1997b) also reported a significant overall association between participation in HIV/AIDS and drug misuse training and beliefs. Pharmacists taking part in training had more positive beliefs toward the role of the pharmacist in HIV/AIDS prevention.

The belief means were obtained for two types of services: (1) the provision of sterile syringes and (2) the provision of NEPs. The choice of responses for selling sterile syringes and providing NEPs were “Yes, currently do,” “Yes, would be willing,” “No, would not be willing.” Factor analysis of the belief statements generated three key components: (1) Role legitimacy – beliefs about the legitimacy of their role as a pharmacist, (2) Training – perceived need, and (3) Support – perceived need. Current pharmacy providers of sterile syringes and NEPs held more positive beliefs toward role legitimacy than willing and non-willing providers. Willing providers had the greatest perceived need for training, whereas current providers were more positive about help (support) being available. Sheridan and colleagues (1997b) felt that the greatest gain would be to focus on training and support for the willing provider group regarding HIV prevention and drug treatment services for drug misusers.

Since it has been well established within the literature that many pharmacists use their own professional discretion when selling syringes to known or suspected IDUs, it is important to examine the factors that influence those decisions. In other words, what factors influence a pharmacist’s decision to provide syringes without prescriptions to known or suspected IDUs? Various researchers have grouped influences into categories such as safety, context of sale (Wright-De Aguero et al., 1998; Weinstein and Wright-De Aguero, 1998), client/customer-related factors and organizational factors (Cockerill et al., 1996). For example, pharmacists have reported risk to oneself or staff, risk of theft/robbery, risk of discarded syringes, and professional liability as important safety concerns influencing one’s decision to sell syringes without a prescription. Also, time of day, presence of other customers, and the presence of in-store security staff have been reported regarding context of sale issues. Client/customer-related factors have included customer familiarity, customer sobriety, customer health, whether the customer is a known or suspected IDU, age, and sex. According to Cockerill and colleagues (1996), “remuneration” and “available space” have been reported as organizational concerns.

How important are such factors to pharmacists when making decisions to sell sterile syringes to known or suspected IDUs? Gleghorn, Gee and Vlahov (1998) had Baltimore community pharmacy managers (N=46) rate important factors that influenced their decision to sell syringes without a prescription. Familiarity with the customer (59%) and concern about HIV spread among IDUs (39%) were rated by respondents as very important. Customer appearance was rated as somewhat important by 39 percent, while customer’s sobriety (61%), risk of theft (52%), customer HIV status (50%), and the presence of other customers (46%) were rated as not important by most of the respondents. Wright-De Aguero et al. (1998) asked Connecticut pharmacy managers (N=345), regardless of pharmacy policy (i.e., at the pharmacist’s discretion), what influenced their personal decisions to sell syringes without a prescription. Safety issues were identified as very important in pharmacists’ personal decision about the sale of syringes with risk of discarded needles (66%), theft/robbery (68%), liability issues (46%) and the safety of self and staff (69%) most commonly mentioned. Supported by findings from the Baltimore study (Gleghorn, Gee and Vlahov, 1998) and the Canadian study (Cockerill et al., 1996), Connecticut pharmacists reported familiarity with the customer as a very important influence in their decision to sell syringes without prescriptions.

However, very few pharmacy managers were willing to sell to minors or known or suspected IDUs under the "customer-related" dimension.

Surveyed pharmacists also revealed their opinions on the effect of the sale of syringes without a prescription for HIV/AIDS prevention. Many pharmacists were not inclined to provide sterile syringes or participate in needle exchange due to the perception that such services would have a damaging effect on business such as intimidation of other patients, an increase in the number of discarded syringes, and encouragement of drug use or other illegal activity (Sheridan et. al., 1997; Sheridan and Barber, 1997). However, it is important to mention that very few serious incidents were reported in pharmacist surveys that specifically asked about negative experiences associated with syringe sales (Case, Beckett and Jones, 1998; USCM, 1999). As previously mentioned, some pharmacists have strong beliefs about drug use and are opposed to making it easier for IDUs to obtain syringes (Binkley et al., 1995), believing that illegal and harmful drug use would increase as a result. Without saying, legal and professional liability greatly affect a pharmacist's decision to sell sterile syringes to suspected IDUs or participate in needle exchange.

On the other hand, pharmacists have reported positive effects of the sale of syringes without a prescription for HIV/AIDS prevention. According to Wright-De Aguero and colleagues (1998), over three-fourths of the pharmacy managers who sell syringes in all cases (N=121) or at the discretion of the pharmacist (N=170) agree that the provision of sterile syringes is an important part of a comprehensive approach to HIV prevention among IDUs, their sex partners and their children. Other positive benefits regarding the provision of sterile syringes without a prescription include the reduction in the spread of HIV and an increase in the use of drug treatment programs by IDUs (Gleghorn, Gee and Vlahov, 1998).

In the only study found in the literature addressing the importance of peer and other social norms, Wright-De Aguero et al. (1998) found that 49 percent of the managers where nonprescription syringes were sold in "all instances" believed that most pharmacists they knew in Connecticut thought that they (pharmacists) should sell syringes without a prescription. However, it was reported that managers overall did not know what other pharmacists' thought or did regarding the sale of syringes. Multiple logistic models revealed that peer norms and perceived beneficial impact influenced pharmacy managers' decisions to provide sterile syringes at the pharmacist's discretion, whereas only perceived beneficial impact influenced the pharmacy manager's decision to provide sterile syringes in the stratum for sales in all instances.

Summary of Literature Review

At least one-third of all HIV/AIDS cases in the U.S. are related to intravenous drug use. The approach, known as "harm reduction," accepts drug use behavior and attempts to minimize its effects via health services and education. Overall, increasing the availability of sterile syringes to known or suspected IDUs via NEPs or pharmacy-based programs reduces unsafe injection practices, reduces the spread of HIV and other blood-borne pathogens (e.g., hepatitis), increases safe disposal of used syringes and offers IDUs counseling and other treatment referral options. The literature has shown that although pharmacists generally support the provision of preventative HIV/AIDS healthcare services, pharmacists often have different opinions about providing preventative HIV/AIDS healthcare services to known or suspected IDUs. With all external barriers removed, pharmacists often use their own discretion when providing sterile syringes to known or suspected IDUs even though the pharmacists are aware that such services may help prevent HIV and other blood-borne pathogens (e.g., hepatitis). Therefore, understanding the factors that determine pharmacists' willingness to provide sterile syringes is important if pharmacies are to be considered viable resources for syringe exchange/provision. Although many states have modified syringe prescription and drug paraphernalia laws to improve access to sterile syringes, this "harm reduction" issue remains controversial in the U.S., with many state laws making it a criminal offense to possess, distribute, and sell syringes with the intent to inject illicit drugs. Despite empirical research showing positive outcomes regarding the effectiveness of NEPs and local, state, and national organizational support, the federal government prohibits the use of its funds for NEPs or other community-based organizations in which needles are exchanged or provided/sold for injection drug use. It is imperative to understand that NEPs and pharmacy-based programs, alone, are not enough to curtail the HIV epidemic among IDUs, but that they should be considered as one part of a comprehensive HIV prevention strategy along with drug treatment, education and counseling.

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CHAPTER 3

THEORY

Rationale for the Study

The controversy over the provision of sterile syringes to known or suspected IDUs to help prevent the spread of HIV and other blood-borne pathogens (e.g., hepatitis) has been discussed in the lay press and reviewed in the scientific literature. A review of the literature has shown that the provision of sterile syringes to known or suspected IDUs via needle exchange programs (NEPs) have been associated with the following: 1) a reduction in unsafe injection practices; 2) a reduction in the incidence of HIV and other blood-borne pathogen infections; 3) an increase in the safe disposal of used syringes; and 4) effective counseling and referral options for IDUs. However, despite these positive results regarding the effectiveness of NEPs, NEPs are simply not enough to provide every IDU with one sterile syringe for each injection. With community pharmacists' education, experience and access to sterile syringes, pharmacy-based needle syringe provision programs have been established in several states throughout the U.S. The profession of pharmacy has the opportunity to expand its boundaries, providing public health initiatives to help reduce the spread of HIV and other blood-borne pathogens among the IDU population. However, scientific research regarding pharmacists' involvement in the provision of sterile syringes to known or suspected IDUs is limited. No known research has specifically assessed community pharmacists' beliefs, attitudes, intentions or willingness to provide sterile syringes to known or suspected IDUs using a grounded theoretical model. This study will contribute to the literature by providing insight into what factors influence community pharmacists' decision-making process regarding the provision of sterile syringes to known or suspected IDUs. Therefore, a need for this study is well established.

Attitudes toward IDUs and the provision of sterile syringes to IDUs may affect community pharmacists' decisions to provide sterile syringes to IDUs. In addition to their own attitudes toward the provision of sterile syringes, community pharmacists may consider the beliefs of significant others/referent groups (e.g., pharmacy clients, other community pharmacists, pharmacy managers, State Board of Pharmacy officials) when deciding whether or not to provide sterile syringes to known or suspected IDUs since community pharmacists serve the public. Also, because the delivery of healthcare services (i.e., pharmacy services) is subject to external factors (i.e., lack of opportunities, lack of resources, pharmacy policies), it is also suspected that community pharmacists' perceived behavioral control over the behavior in question may influence their formation of intentions (willingness) to provide sterile syringes to IDUs. In the domain of health, the application and testing of theoretical models such as the Theory of Reasoned Action (TRA) or the Theory of Planned Behavior (TPB) have almost exclusively focused on predicting the intentions and behaviors of patients (Millstein, 1996). Given this, such models could be extremely informative in predicting intentions (willingness) and behaviors of healthcare providers as well (i.e., community pharmacists' willingness to provide sterile syringes to known or suspected IDUs).

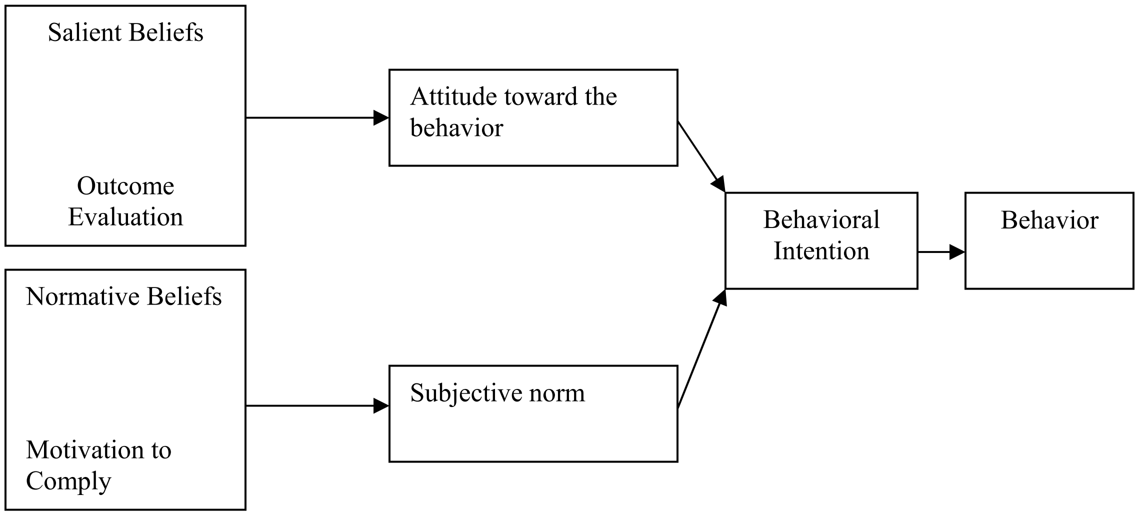
Theory of Reasoned Action (TRA)

Researchers have shown great interest in the relationship between attitude and behavior. The TRA is a general model of behavior that offers one approach for explaining individual's behavioral intentions and behaviors (Ajzen and Fishbein, 1980). The TRA evolved from independent, applied research problems that confronted investigators in the 1950s and 1960s. Researchers were concerned with problems of attitude theory, measurement, and the prediction of behavior. The TRA is centered on the idea that people are logical and make methodical use of information available to them. The TRA supports the idea that people generally take into account implications of their actions before they decide to engage or not to engage in a given behavior. In other words, behaviors are under volitional control.

According to the model, overt behavior is a function of an individual's intention to perform that function. The TRA establishes a link between behavioral intention and behavior, and specifies the inter-relationships and causal processes among the variables (Fishebein and Ajzen, 1975; Ajzen and Fishbein, 1980). Behavioral intention is influenced by two additive components: attitude toward the behavior and subjective norms. Thus, the TRA consists of three components:

1) <u>Intention</u> – immediate determinant of behavior;
2) <u>Attitude toward the behavior</u> – positive or negative evaluations of performing the behavior; and
3) <u>Subjective norm</u>- social pressure to perform or not to perform a behavior.

Figure 3.1
Theory of Reasoned Action



Source: Ajzen I and Fishbein M. Part 1. Chapter 1. A Theory of Reasoned Action. *Understanding Attitude and Predicting Social Behavior*. Prentice Hall, Inc., Englewood Cliffs, NJ: 1980.

As indicated by the TRA model, information or salient beliefs affect intentions either through attitudes and/or through subjective norms (SN). The attitudinal component can be described as “a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object” (Fishbein and Ajzen, 1975). The attitude toward a behavior in the TRA model has two features. Attitudes are determined by beliefs about a given object and by the evaluation of attributes, characteristics, or qualities of a given object. Beliefs or salient beliefs about an object are referred to as the cognitive component or the “knowledge.” The second component is affective in nature, the evaluative aspect of the outcome.

$$A = \sum e_i b_i$$

A = attitude toward object
b = the belief about the object's attributes or about the act's consequences
e = evaluations of attributes or consequences

According to Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980), attitude is determined by multiplying the evaluation of the attribute by the subjective probability that the object is related to the attribute and then summing the products.

The TRA also recognizes the importance of social influences on the individual. The normative side of the TRA framework also has two components. The first component is the individual's perception of the most salient group norms. The second component is the individual's motivation to comply. Peer group norms must have a cost or benefit for the individual to be compliant/noncompliant with regard to the behavior in question (Vanlandingham et al., 1995). Therefore, individuals are more likely to have intentions to engage in a specific behavior if such intentions are seen as instrumental in achieving desired consequences and are considered worthwhile by persons or groups the individual wishes to please. For example, a pharmacist may perceive social pressures to provide counseling on the practice of safe sex when condoms are purchased if the pharmacist believes that the pharmacy manager thinks the he/she should provide the counseling and the pharmacist is motivated to comply with the pharmacy manager. The strength of each normative belief is multiplied by the individual's motivation to comply with the referent in question, and the subjective norm is directly proportional to the sum of the resulting products across the salient referents as shown in the following equation:

$$SN = \sum n_i m_i$$

SN = Subjective Norm
n = normative belief
m = motivation to comply

The predictive ability of the TRA has been analyzed in many studies in a variety of settings. A vast body of research supports this model in predicting intentions and behaviors (Ajzen and Fishbein, 1980). Empirical research has established the theory's predictive validity regarding various types of behavior under volitional control such as weight loss behaviors, family planning behaviors, consumer behaviors, voting behaviors, study behaviors, seat belt usage behaviors and drinking behaviors (Ajzen and Fishbein, 1980; Pender and Pender, 1986; Sideridis, Kaissidis and Padeliadu, 1998; Leone, Perugini and Ercolani, 1999; Albarracin et al., 2001). Sheppard, Hartwick and Warsaw (1988) conducted a meta-analysis to investigate the effectiveness of the TRA in predicting intentions and behaviors. The authors reviewed 87 separate studies involving 174 behaviors. Behaviors ranged from voting in presidential elections to resigning from a job to having an abortion to using birth control pills. Overall, the authors estimated correlations of $R=0.66$ ($p=0.001$) for the intention-attitude and subjective norm relationship and $R=0.53$ ($p=0.01$) for the intention-behavior relationship. In other words, 43 percent of the variance in intention was explained by attitudes and subjective norms and 28 percent of the variance in behavior was explained by intention, indicating that the TRA constructs significantly influence intention and behavior. Even though the meta-analysis conducted by Sheppard and colleagues (1988) provided support for the use of the TRA in the prediction of intentions and behaviors, only 20 percent of the studies predicting behavior and 11 percent of the studies predicting intentions used the models correctly. Several studies in the meta-analysis reported examining more than one behavior, providing alternative choices, and not using intention as a measure. Sheppard and colleagues (1988) concluded, however, that the model performed extremely well, even if utilized in situations that did not fall within the boundaries set by the model. Albarracin et al. (2001) reported positive findings in their more recent meta-analysis of the TRA in predicting a single behavior. After reviewing 42 studies using the TRA to predict condom use, Albarracin and colleagues (2001) concluded that the TRA was a "highly successful" predictor of condom use. As implied by the model, the intention to use condoms can be predicted from attitudes and subjective norms which are formed from salient beliefs.

Because the settings and circumstances of the research using the TRA have varied so widely in the literature, and because of the nature of this project, the remainder of this TRA review will focus on studies of the TRA that involve health-related behaviors. Also, because the focus of this study is on pharmacists' willingness to provide sterile syringes to known or suspected IDUs and not the actual behavior, the review of the TRA will concentrate on the constructs of the model as they relate to intention formation and not so much on actual behavior.

Table 3.1 summarizes a sample of the studies found in the literature that use the constructs of the TRA to predict intentions of health-related behaviors. Please note that Table 3.1 is not an exhaustive list of studies predicting health behaviors using the TRA, but a sampling. Attitudes and subjective norms accounted for a significant proportion of variability in health-related intentions, ranging from 5.5 percent to 47 percent. The TRA constructs routinely predicted intentions to perform health-related behaviors.

Table 3.1
Review of Studies Using The Theory of Reasoned Action to Predict Intentions of Health-Related Behaviors

Study	Behavior	Sample (N)	Correlation Coefficient (r)/ Beta Weights (β) for A-I	Correlation Coefficient (r)/ Beta Weights (β) for SN-I	Intention R^2
Pender and Pender (1986)	1) exercise regularly 2) maintain weight 3) avoid stressful situations	377 residents of households	1) r=.177 ** 2) r=.127** 3) r=.271***	1) r=.263** 2) na 3) na	1) R^2=.054 * 2) na 3) na
Ried and Christensen (1988)	drug taking compliance	113 female college students	β=.22****	β=.36****	R^2=.34****
Chan and Fishbein (1993)	tell partners to use condoms	312 females	β=.42**	β=.20**	R^2=.26.5**
McCaul et al., (1993)	1) Breast Self Exam 2) Testicular Self Exam 3) Brushing teeth 4) Flossing teeth	1-2) 138 college students 3-4) 81 college students	1) β=.55* 2) β=.64* 3) β=.30* 4) β=.10*	1) β=.05* 2) β=.04* 3) β=.10* 4) β=.33*	1) R^2=.34* 2) R^2=.43* 3) R^2=.11* 4) R^2=.15*
Burak (1994)	teach HIV/AIDS education	198 elementary school teachers	Na	na	R^2=.47***
Vanlandingham et al. (1995)	unsafe sexual practices	1472 Thai men	*	***	na
Millstein (1996)	delivery of preventative services	765 primary care physicians	β=.22***	β=.28***	R^2=.15***
Dilorio (1997)	to care for persons with HIV/AIDS	368 neuroscience nurses	β=.184***	β=.048	R^2=.042***
Rise and Wilhelmsen (1998)****	not to drink alcohol at the next home party	1) 896 7^{th} graders 2) 906 9^{th} graders	1) boys β=.09 girlsβ=.21 2) boys β=.12 girlsβ=.14	1) boys β=.46 girls β=.41 2) boys β=.39 girlsβ=.41	1) boys R^2=.26 girls R^2=.28 2) boys R^2=.20 girls R^2=.24

A-I = Attitudes-Intention, SN-I = Subjective Norms-Intention, na=not available
*p<.05, **p<.01, ***p<.001, ****significant (p value not indicated)

Two studies listed in Table 3.1 examined the applicability of the Health Belief Model (HBM) and the TRA in predicting health-related behaviors (Ried and Christensen, 1988; Vanlandingham et al., 1995). In 1988, Ried and Christensen published results of their study that applied the HBM and the TRA in predicting drug-taking compliance behavior among female patients with uncomplicated urinary tract infections (UTI). A total of 113 females participated in the study. All female patients presenting a prescription for 20 tablets of Bactrim DS for the treatment of an uncomplicated UTI were asked to participate in the study. Using stepwise regression analysis, four TRA variables were significant predictors of intention: 1) subjective norms, 2) normative expectations, 3) salient belief strength, and 4) attitude. Together, all four variables accounted for 34 percent of the variance in compliance intention. When adding TRA variables to the HBM using hierarchical regression procedures, an additional 19 percent of the variance in actual compliance was explained compared to the initial 10 percent of variance explained by the HBM variables alone. It is interesting to note that social influence variables strongly predicted compliance intentions even though none of the normative behaviors entered into the equation when predicting compliance behavior. In their final conclusion, Ried and Christensen observed that while the influence of significant others plays a role in forming intentions, patients' own attitudes and situational circumstances had a greater impact on whether or not the patient actually completed the medication. It should be noted that results of the study should be generalized only to similar populations and disease states since modifying situations can influence even the best of intentions.

Vanlandingham and colleagues (1995) applied the HBM and the TRA to an analysis of risky sexual practices (inconsistent condom use with commercial sex workers) among Thai Males. Results indicated that both applications of the theories provided useful guidelines for identifying important covariates of consistent condom use for this population. However, according to the Bayesian approach, the TRA model resulted in a greater reduction in the model deviance, correctly classifying 71 percent of the cases into the correct condom use category compared to the HBM correctly classifying 65 percent of the cases. The relative advantage of the TRA model appeared to be largely due to the incorporation of normative influence as supported in the Ried and Christensen (1988) study. Vanlandingham and colleagues (1995) state that the "results provide strong support for TRA's contention that both perceived norm and motivation to comply are important components of the decision making process." It is important to note that this study used a cross-sectional approach rather than a longitudinal approach, making it more difficult to determine cause and effect.

Chan and Fishbein (1993) assessed college women's intentions to tell their partners to use condoms every time they had sexual intercourse. Results showed that the TRA received considerable support, with both attitudes and subjective norms accounting for 26 percent of the variation of women's intention. In contrast to the findings from Vanlandingham et al.'s (1995) study, attitude toward the behavior was more important than social influences. However, with the addition of Triandis' concept of "emotional reaction" or "emotional gut reaction" variable, three percent of the variation in intention was added beyond that explained by the TRA constructs. Even though the increase was small, the authors noted that future researchers should consider emotional reactions in addition to the "affective" component of attitude when predicting health-related intentions and behaviors.

In Pender and Pender's (1986) study, the researchers studied the relationships among attitudes, subjective norms, and intentions regarding weight loss behaviors. Intentions to (1) exercise regularly, (2) maintain/attain recommended weight, and (3) avoid highly stressful life situations in a group of 377 adults in two Midwestern communities were examined. Data were collected using a questionnaire developed from interview information according to guidelines described by Ajzen and Fishbein (1980). For the intention to exercise regularly ($r=0.223$), only 5.5 percent ($p=0.01$) of the variance was accounted for by attitudes and social norms. When weight of the individual was added to the model, the accounted variance doubled to 13 percent ($p=0.01$). For the intention to maintain/attain the recommended weight, attitude was significantly associated with intention, but not subjective norms. Similar results were found with the intention to manage stress, with attitude having a low but significant correlation with intention and subjective norms not significantly contributing to the model. It appears attitude plays a major role in the formation of intentions to lose weight. However, the authors suggest that more research needs to be conducted to determine the true potential of the TRA in predicting weight loss behaviors.

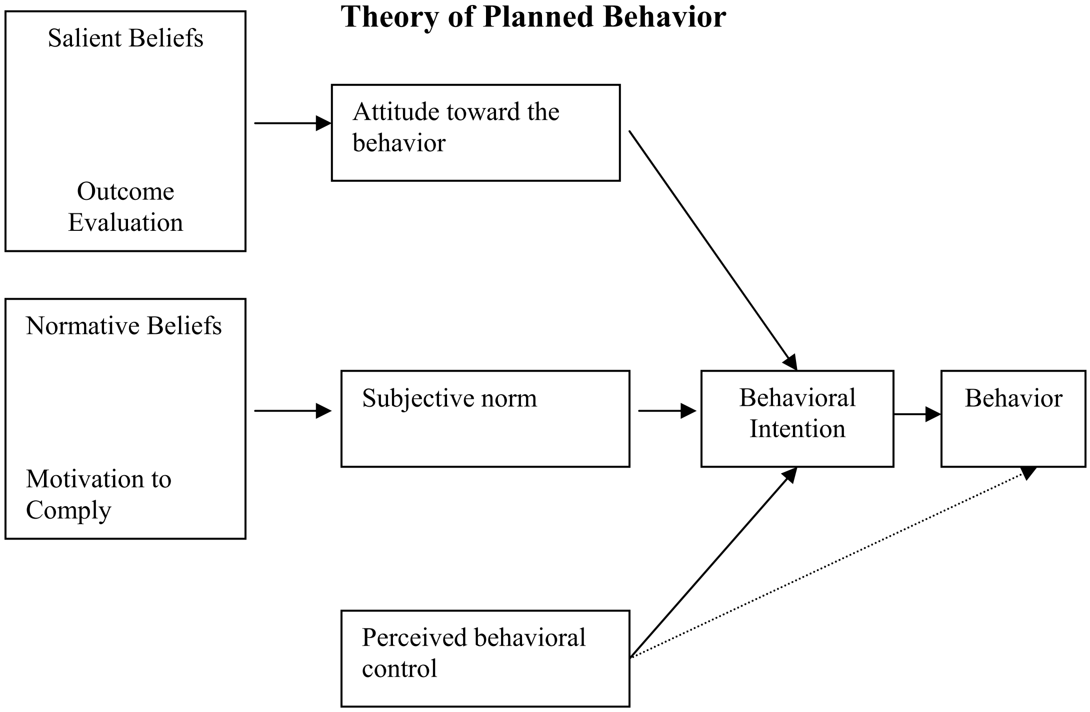
Overall, many studies confirm that the TRA is very useful in predicting the intention to engage in a particular health behavior as well as predicting the behavior itself when the behavior in question is under total volitional control. Many studies find that both attitudes and subjective norms are significant predictors of intention and behavior. A few studies have reported the attitudinal component to be a better predictor of intentions and behavior, while other studies have reported subjective norms as the better predictor. For health behaviors that affect others, intentions appeared to be significantly shaped by social influences, whereas, attitudes appeared to significantly influence intentions for behaviors that primarily affect the individual performing the behavior.

Despite the positive findings supporting the use of the TRA, not all behaviors or under total volitional control. In Table 3.1, for example, the TRA proved to be a useful model in: 1) predicting health-protective behavioral intentions (McCaul et al., 1993); 2) predicting alcohol consumption at the next home party (Rise and Wilhelmsen, 1998); 3) providing care for persons with HIV/AIDS (Dilorio, 1997); and 4) teaching HIV/AIDS education (Burak, 1994). However, adding the perceived behavioral control (PBC) construct to the model, a construct found in the Theory of Planned Behavior (TPB) model, significantly improves the predictive validity. Therefore, when particular behaviors violate the assumption of total volitional control, other grounded theories should be considered. One such theory is the TPB.

Theory of Planned Behavior (TPB)

As discussed previously, the TRA is a well-developed and tested behavioral model that has been used to successfully predict a variety of health-related behaviors (Millstein, 1996). However, the TRA has its limitations, such that the behavior in question must be under total volitional control. In recognition of this limitation, Ajzen (1991) added an additional component to the model for behaviors that are not completely under an individual's volitional control: the individual's belief about his/her ability to perform the behavior. Therefore, Ajzen (1991) expanded the TRA to include a "perceived behavioral control" component. The TPB is an extension of the TRA made necessary by the TRA model's limitations in dealing with behaviors in which people have incomplete volitional control. As in the TRA, the central component in the TPB model is the individual's intention to perform a specific behavior. Not all behaviors can be performed at will, or under volitional control. Some behaviors may in fact depend at least to some degree on such non-motivational factors as availability of opportunities and resources. In other words, perceived behavioral control is often referred to as an individual's perceived ability to perform a given behavior due to external factors.

Figure 3.2
Theory of Planned Behavior



Source: Ajzen I. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*. December 1991; 50(2): 179-211.

The TPB postulates three conceptually independent determinants of intentions: attitude toward the behavior, subjective norms (SN), and perceived behavioral control (PBC). Perceived behavioral control plays a vital role in the TPB model. The perceived behavioral control construct refers to an individual's perception of the ease or difficulty in performing the intended behavior. Perceived behavioral control is included as an exogenous variable that has both a direct effect on intention and an indirect effect on behavior through intentions. The resources and opportunities available to a person must to some extent dictate the likelihood of behavioral achievement. As a general rule, the more favorable an attitude toward the behavior, the more favorable a subjective norm toward the behavior, and the greater the perceived behavioral control, the stronger an individual's intention is to perform the behavior under consideration.

To measure perceived behavioral control, each salient control belief is multiplied by the perceived power of the particular control factor to facilitate or inhibit performance of the behavior. The resulting products are summed across the salient control beliefs to produce the PBC.

$$PBC = \sum c_i p_i$$

PBC = perceived behavioral control
c = the control belief that a specific factor will increase or reduce the difficulty of performing the behavior in question
p = the perceived power of a particular control factor to facilitate or inhibit performance of the behavior

As mentioned with the TRA, the TPB has been applied in wide array of behavioral domains, including searching for jobs, playing video games, voting, losing weight, attending class, committing driving violations and cheating (Godin, Valois and

Lepage, 1993; Parker et al., 1992; Ajzen, 1991). Madden, Ellen and Ajzen (1992) compared the TRA with the TPB for ten different behaviors. The behaviors included exercising regularly, getting a good night's sleep, talking to a close friend, doing laundry, avoiding caffeine, going shopping with a friend, renting a videocassette, taking vitamin supplements, and listening to an album. Inclusion of the PBC construct did increase the predictive validity of intentions for all ten behaviors. The change in R^2 ranged from an increase of one percent (intentions to take vitamins) to 20 percent (intention to talking to a close friend), concluding that the TPB explained significantly more variation than the TRA. On average, the change in R^2 due to the addition of the perceived behavioral control construct was 11 percent. In fact, a number of researchers have relied on the TPB to predict and understand people's intentions to engage in various activities (Ajzen, 1991), including general health behaviors. Because the settings and circumstances of the research using the TPB have varied so widely, and because of the nature of this project, the remainder of this review will be restricted to studies of the TPB that involve health behaviors. Also, because the focus of this study is on pharmacists' willingness to provide sterile syringes to known or suspected IDUs and not actual behavior, the review of the TPB will concentrate on the constructs of the model as they relate to intention formation and not so much to behavior.

Godin and Kok (1996) reviewed applications of the TBP in the domain of health and verified the theory's predictive validity regarding health-related behaviors. Fifty-six studies were reviewed with 58 behavioral applications and 87 intentional applications. The 58 health behaviors were classified in the following categories:

1) Addictive (e.g., cigarette, alcohol, drugs, eating disorder),
2) Automobile,
3) Clinical screening (e.g., cancer screening, health check),
4) Eating,
5) Exercising,
6) HIV/AIDS, and
7) Oral Hygiene.

The authors reported that attitudes, subjective norms, and perceived behavioral control accounted for an average of 41 percent of the variance in intention, varying from 32 percent (eating disorders) to 47 percent (oral hygiene behaviors). Attitudes, subjective norms and perceived behavioral control were found to be significant components in the prediction of intention in 82 percent, 47 percent and 86 percent of the behavioral applications, respectively. On average, the perceived behavioral control construct added an additional 13 percent to the explained variance in intention. Averaged correlations for attitude were highest for addictive, clinical/screening, and HIV/AIDS-related domains. Averaged correlations for subjective norms were highest for automobile-related and oral-hygiene domains, while perceived behavioral control averaged correlations were highest for oral-hygiene. Godin and Kok (1996) concluded that perceived behavioral control is an important construct for explaining intention, clearly standing by itself in health-related behaviors. Subjective norm appears to be less important in the prediction of intentions. Even in domains where it reached significance, it was often lower than attitude and perceived behavioral control. In general, the TPB performs quite well across various health-related behavioral domains.

Within the exercise domain, Blue (1995) conducted a meta-analysis and revealed that the addition of the perceived behavioral control construct over the TRA constructs increased the prediction of intention to exercise. In most of the studies, attitudes and perceived behavioral control were better predictors of intentions. Twenty-three studies were reviewed. Similar to findings reported by Godin and Kok (1996) and Godin, Valois and Lepage (1993), subjective norms had a nonsignificant influence on intentions to exercise. In the meta-analysis by Blue (1995), Blue reported that correlations of subjective norms were positive but nonsignificant for all but five of the exercise-related studies. Social influences, even when significant, were small. This implies that exercise is a personal choice and not influenced by social pressure. The role of attitude is also in agreement with a study by Godin, Vezina and Leclerc (1989) where attitudes strongly influenced intentions to exercise after pregnancy, accounting for one-third of the variance for both nullipara and pluripara women. In addition to attitude, other variables such as habit was a significant contributor to the prediction of intention for nullipara women, whereas, perceived barriers and subjective norms were more significant in predicting intention for pluripara women.

The literature has shown that attitudes and perceived behavioral control significantly contribute to the prediction of pregnant women's intention to breastfeed (Wambach, 1997) and mother's intention to limit the frequency of their infants' sugar intake (Beale and Manstead, 1991). Among 135 pregnant women (Wambach, 1997), attitudes and perceived behavioral control explained 23 percent of the variance in intention to breastfeed, with attitude being the largest contributor (Attitude, $\beta=.30$; PBC, $\beta=.27$, $p=0.001$). Subjective norm was proven not to be a factor. Results showed that the women held positive attitudes toward breastfeeding, had high levels of PBC, and were not significantly influenced by social norms.

Beale and Manstead (1991) examined the applicability of the TPB to account for mothers' intentions to limit their infants' sugar intake. One group of mothers was exposed to a dental health education program and the other group was not. Both the experimental group and the control group were interviewed twice to predict intention. Adding the perceived behavioral control construct to the model to predict pregnant mothers' intentions to limit their infants' sugar intake increased the explained variance by 4.5 percent (R^2=16%, p=0.01) before the dental health education program and by 5.8 percent (R^2=27%, p=0.01) after the dental health education program. The authors reported a significant change in attitudes in the experimental group which correlated strongly with the nonsignificant change in intention in the experimental group. Attitudes strongly influenced intention formation among this group of mothers. Overall, these findings suggest that this behavior is at least partly nonvolitional and that the behavioral intention is strongly influenced by attitudes followed by perceived behavioral control. Subjective norms made only a small and non-significant contribution to predict mothers' intentions to limit their infants' sugar intake.

Attitudes (β=.53, p=0.0001) followed by subjective norm (β=.19, p=0.001) and perceived behavioral control (β=.14, $p<0.05$) significantly influenced 191 student smokers' intentions to participate in a smoking-cessation program (Babrow, Black and Tiffany, 1990). Forty-nine percent of the variance in intention was explained by attitudes, subjective norms, and perceived behavioral control. Overall, student smokers expressed moderate intention to participate in the study. The authors noted that perceived behavioral control should be interpreted with caution due to the low reliability on the composite for control beliefs (α=.53). Analysis of the outcome beliefs revealed that most of the differences in intentions were due to variations of positive consequences. Students more likely to participate in the smoking-cessation program believed that positive consequences were more likely as a result of their participation. Overall, the researchers felt that the TPB is useful for understanding and implementing health communication campaigns that encourage participation in smoking-cessation programs.

Rise and Wilhelmsen (1998) conducted a study to predict adolescent's intention not to drink alcohol at the next home party in two different age groups (13 and 15 years of age) using the TPB. The researchers used seventh graders (N=915) and ninth graders (N=982) from 12 schools in central and suburban areas of Bergen, Norway. Students completed questionnaires derived from a pilot study that measured behavioral intention, behavioral beliefs, normative beliefs and control beliefs. From their results, the authors found that the inclusion of perceived behavioral control improved the prediction of behavioral intentions. In other words, perceived behavioral control better predicted adolescents' intentions to not drink alcohol at the next home party beyond the effects of the components of the TRA. Unlike intentions to exercise, the subjective norm construct was the strongest predictor of intention not to drink at the next home party for seventh and ninth graders. This is a logical finding since the context (i.e., home) of this particular behavior is often controlled by parents (i.e., referent group) for this age group.

Quine and Rubin (1997) also reported subjective norm as the strongest TPB construct when predicting women's intention to use hormone replacement therapy (HRT). The TPB constructs explained 36 percent of the variance in intention. All three constructs were significant predictors of intention (Attitude, β=.16; SN, β=.33, PBC, β=.30, $p<0.001$). When the variable, similar prior behavior, was added to the model using hierarchical multiple regression analysis, the variable made a significant contribution to the prediction of intention, even though it was small (R^2change=1%, $p<0.001$). Quine and Rubin state that attitude may be more important than normative beliefs in situations where behavior is performed in private (e.g., testicular exam). In McCaul et al.'s (1993) study, attitude significantly influenced the prediction of intentions over subjective norms with regards to self breast exams and self testicular exams. Quine and Rubin (1997) also report that subjective norm is more important in situations where the preventative health behavior is performed publicly (e.g., committing driving violations). In Parker et al.'s (1992) study, perceived behavioral control and subjective norm contributed significantly to the prediction of intentions to commit driving violations over that perceived by attitudes. Subjective norm may also be more important with regards to behavior that may affect the lives of referent others if the behavior is not performed. Quine and Rubin (1997) feel that this may be the reason that subjective norm plays an important role in the formation of intentions to take HRT because not taking HRT may have consequences for other people (i.e., spouse, children).

Despite the TPB's usefulness to predict health-related intentions and behaviors, it is clear from the literature that the application and testing of the TPB has almost exclusively focused on predicting the intentions and behaviors of patients or consumers. However, given the focus of this study (i.e., pharmacists' willingness to provide sterile syringes to known or suspected IDUs), it is important to review the literature and discuss applications of the TPB in predicting intentions and behaviors of healthcare providers.

Three studies have used the TPB to explain and better understand the decision making processes of nurses (Randall and Gibson, 1991; Nash, Edwards and Nebauer, 1993; Dilorio, 1997). Nash, Edwards and Nebauer (1993) examined the behavioral factors that underlie nurses' assessment of pain. The researchers asked the following questions:

1) What is the nature of nurses' attitudes, subjective norms, and perceived control regarding the performance of assessments?
2) Can intention to perform a pain assessment be predicted from nurses' attitudes, subjective norms and perceived control?
3) What is the relative contribution of attitudes, subjective norms and perceived control to the prediction of intention to perform pain assessment?

One hundred nurses received the questionnaire. The questionnaire was developed to measure the constructs contained in the TPB as they related to nurses and pain assessment. Multiple regression revealed that perceived behavioral control was the only variable to make a significant contribution to the prediction of intention to assess patients' pain (Attitude, $=\beta .10$; SN, $\beta = -.09$; PBC, $=\beta .46$, $p<0.001$). Attitude, subjective norm, and perceived behavioral control accounted for 21 percent of variance in intention to assess patients' pain. Groups were further divided into "intenders" and "non-intenders." Only perceived behavioral control scores revealed a significant difference between intenders and non-intenders ($p<0.05$). It is important to note that despite the nonsignificant contributions of attitudes and subjective norms, both constructs were positive. One can conclude that although perceived behavioral control plays a major role among nurses in the prediction of intentions to assess patients' pain, these nurses generally believed in the importance of pain assessment and perceived a small degree of social influence. In general, the more resources and opportunities the nurses think they had, the greater their intention to assess patients' pain since intention was greatly influenced by the perceived behavioral control construct.

Dilorio (1997) examined 368 neuroscience nurses regarding their intentions to care for persons with HIV/AIDS. Hierarchical multiple regression showed that adding the perceived behavioral control construct to the existing TRA constructs improved the predictive validity of the model. The perceived behavioral control construct increased the amount of explained variance to 15 percent ($p<0.001$), an increase of 11.3 percent above the TRA explained variance. Perceived behavioral control was the only significant contributor to the prediction of intention in the final model. Attitudes, subjective norm and perceived behavioral control were all positively correlated with intention, meaning that those who held positive attitudes, had support from others and who perceived control over the situation, were more likely to care for persons with HIV/AIDS. Similar to findings in Nash, Edwards and Nebauer's (1993) study regarding nurses' intentions to assess patients' pain, nurses intending to care for persons with HIV/AIDS perceived that they had control over resources necessary to perform the behavior.

In 1991, Randall and Gibson published findings from their study applying the TPB to the explanation of ethical decision making among 116 nurses. The questionnaire contained four scenarios: 1) doctor/incompetence, 2) doctor/mistake, 3) nurse/incompetence and 4) nurse/mistake, followed by questions that measured the key constructs of the TPB. The nurses were asked if they would report to their supervisors about healthcare professionals responsible for the mistakes/incompetence depicted in the scenarios. Regression analysis revealed that attitude and subjective norms were significant contributors to the prediction of intention (Attitude, $\beta=.67$, $p<0.001$; SN $\beta=.22$, $p=0.001$; PBC, $\beta=.05$, $p=0.41$). Together, the TPB constructs accounted for 61 percent of the variance in intent to report the healthcare professional. Attitude contributed to over 50 percent of the accounted variance. Out of 12 behavioral beliefs, two beliefs significantly predicted attitude toward the behavior: 1) protecting the health and safety of patients ($p<0.001$) and 2) being responsible for getting the health professional disciplined ($p<0.05$). Among the four scenarios, nurses were more likely to report the incompetence (72%) than the mistake (52%) ($p=0.002$). In all scenarios, attitude toward the behavior was the most significant. The researchers entered a "moral obligation" variable into the model and found it to significantly increase explained variance in intent (R^2change=.0016, $p<0.001$). Only in one scenario (nurse/mistake) was the perceived behavioral control beta significant ($\beta=.31$; $p<0.01$). Interesting to note, the authors concluded that the TPB is useful in explaining ethical decision making and that reporting a colleague to a supervisor may be perceived to be under volitional control despite the nonsignificant contribution of the perceived behavioral control construct to the TPB model in three out of the four scenarios.

With regards to predicting intentions and behavior of healthcare professionals, Millstein (1996) conducted a study comparing the ability of the TRA and the TPB to predict, prospectively, physician's behavior in regard to educating adolescent patients about the transmission of HIV and other sexually transmitted diseases. Interestingly, neither the TRA nor the TPB had been used prospectively as a model for explaining physician behavior. The study was comprised of 765 board-certified physicians practicing in California. Data from questionnaires were collected at two times, six months apart. At Time 1, Millstein collected information on TRA and TPB model variables, physicians' sociodemographic and practice attributes and physician behavior. At Time 2, Millstein assessed physician behavior again. Regressing intention on attitudes and subjective norms yielded a significant overall model for TRA constructs ($R=.39$, $p<0.0001$) and regressing intention on attitudes, subjective norms, and perceived behavioral control yielded a significant overall model for TPB constructs ($R=.52$, $p<0.0001$). This finding indicated that the TPB constructs significantly improved the prediction of behavioral intention (R^2change=.12, $p<0.0001$). All three constructs significantly contributed to the model (Attitude, $\beta=.11$; SN, $\beta=.21$; PBC, $\beta=.37$, $p<0.001$). Also, the addition of perceived behavioral control in the first step of the equation added significantly to the prediction of behavior (R^2change=.11, $p<0.0001$). In other words, perceived behavioral control accounted for 11 percent of the variance alone in predicting behavior, indicating that perceived behavioral control has a direct influence on behavior, without regard to intention. It is important to note that the research found a direct effect of perceived behavioral control when behavior was regressed on attitudes, social norms, perceived behavioral control and intention simultaneously ($\beta=.18$, $p<0.0001$). In general, physicians who believed that they had control over the situation (i.e., resources, opportunities) had greater intentions to provide preventative services. The results of the study indicated that the TPB has relevance for predicting intentions and behaviors of healthcare professionals.

In a review of the literature, two studies examined the utility of the TPB to predict teachers' intentions to teach HIV/AIDS education (Burak, 1994) and to provide dietary counseling (Astrom and Mwangosi, 2000). Burak (1994) examined and predicted 198 elementary teachers' intentions to teach HIV/AIDS education in the 1992-1993 school year. Using the TPB, Burak (1994) administered questionnaires to 16 urban and suburban elementary school teachers in central and eastern Massachusetts. Both direct measures and indirect measures of attitudes, subjective norms, and perceived behavioral control were elicited. Multiple regression results showed that adding the perceived behavioral control construct increased the explained variance in intention to 64 percent ($p=0.0001$), an increase in R^2 of 17 percent above that explained by attitude and subjective norms alone. The teachers' beliefs that they did or did not have control over the situation (perceived behavioral control) was the strongest predictor of intentions. Among direct and belief-based measures, significant correlations ($p=0.0001$) were found between each direct measure and its corresponding belief-based measure. Burak (1994) found that the teacher's grade level, in-service training, and past experience all made significant contributions to the explained variance, increasing the explained variance an additional 4.7 percent, two percent, and eight percent, respectively. Even though perceived behavioral control contributed the greatest relative weight to the prediction of intentions, teachers in this study did not believe that they had the resources, opportunities, or support to teach HIV/AIDS in the 1992-1993 school year. Therefore, the design of interventions should aim to increase teachers' perceptions of control over HIV/AIDS education.

Similar to findings in the Burak (1994) study, Astrom and Mwangosi (2000) found that the perceived behavioral control construct played a major role in the prediction of primary school teachers' (N=232) and teacher-trainees' (N=195) intention to provide dietary counseling. R^2 increased from .24 to .39 ($p<0.001$) for teachers and from .33 to .44 ($p<0.001$) for teacher-trainees when perceived behavioral control was added to the model, indicating that the TPB is a better fit in predicting intentions. Perceived behavioral control and attitude were the strongest predictors among teachers, whereas, perceived behavioral control and subjective norms were the strongest predictors among teacher-trainees. Teacher-trainees may not have had relevant teaching experience needed to form strong attitudes toward the intention to provide dietary counseling, and therefore, were more influenced by social norms. Perceived behavioral control was the strongest contributor in both groups, whereas, subjective norm was not a significant contributor in the teacher group. The results indicate that the TPB is far superior than the TRA in the prediction of intentions in this situation. Since intention for both teachers and teacher-trainees to provide dietary counseling seemed equally predictable, Astrom and Mwangosi (2000) believed this finding "supports the theoretical expectation that predictive value of the TPB remains unaffected by the nature of prior experience." Similar to findings in the Burak (1994) study, Astrom and Mwangosi (2000) stated that in order to encourage teachers and teacher-trainees to provide dietary counseling, strategies need to be developed to increase their perceived control over the situation.

It is extremely important to mention that research exploring the applications of the TPB are not limited to the key TPB constructs: attitude, subjective norm and perceived behavioral control. Many researchers have modified the model by introducing other variables such as 1) self-identity (Sparks and Guthrie, 1998; Armitage and Conner, 1999; Terry, Hogg and White, 1999), 2) self-efficacy (Terry and O'Leary, 1995; Armitage and Conner, 1999) and past behavior (Sheeran, Norman and Armitage, 2000). Due to the focus of this study (i.e., pharmacists' willingness to provide sterile syringes to known or suspected IDUs), past behavior will be reviewed in more detail. According to Leone, Perugini and Ercolani (1999), past behaviors predict intention (in this case, willingness) even when perceived behavioral control is included. Although past behavior has been shown to improve the predictive validity of the TPB, the authors note that the effect of past behavior on intentions are noticeably decreased from the TRA to the TPB because of the inclusion of the perceived behavioral control construct. According to the researchers, the perceived behavioral control component is a self-efficacy based variable, and therefore, can tap into a portion of past behavior effects on intention. In examining and predicting elementary school teachers' intentions to teach their students about HIV/AIDS, the addition of the past experience variable to the TPB model resulted in an explanation of 72 percent of the variance in teacher's intention (Burak, 1994). In Quine and Rubin's (1997) study examining women's attitudes toward the use of HRT, predicting intention and measuring past behavior, the authors reported that a hierarchical multiple regression showed that past behavior made a small independent contribution to the prediction of intention when added after the components of the TPB. In Albarracin et al's. (2001) meta-analysis reviewing TRA and TPB applications regarding condom use, intentions correlated more strongly with past behavior than with future behaviors. Perceived behavioral control was also more strongly associated with past behavior than with future behavior. However, when past behavior was added to the TPB model, the influences of attitudes, subjective norms, and perceived behavioral control on intention became small. Overall, researchers recommend the consideration of a past behavior variable when predicting intentions and behaviors.

In summary, the TPB has been shown to be a useful model in predicting intentions from attitudes, subjective norms and perceived behavioral control constructs across a variety of health behaviors. The addition of the perceived behavioral control construct has significantly increased the amount of explained variance in intention. An important discovery for this study is that the TPB has not only been shown to be useful in the prediction of health-related behavioral intentions among patients, but also among healthcare professionals. The TPB has been shown to significantly contribute to the prediction of healthcare professionals' (e.g., nurses, doctors) intentions to provide preventative and other professional services to patients and/or consumers. The behavior in question and situational characteristics greatly affect the individual contributions of attitudes, subjective norms and perceived behavioral control. Therefore, the TPB model may be useful for predicting pharmacists' intentions (willingness) to provide preventative and other professional services to patients and/or customers. Additional studies should be conducted to further examine the decision-making processes among other healthcare providers (i.e., pharmacists) to better predict health-related intentions and behaviors.

Objectives

The purpose of this study was to achieve a better understanding of why community pharmacists are willing or not willing to provide sterile syringes to known or suspected IDUs. A better understanding of this health-related intention (willingness) formation may be achieved by using the TPB. The five primary objectives of this study were:

1. To explore the utility of the TPB (attitude, subjective norm, perceived behavioral control) and the predictive strength of each TPB component in predicting community pharmacists' willingness to provide sterile syringes to known or suspected IDUs;

2. To determine if the perceived behavioral control construct adds to the prediction of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond that explained by attitude and subjective norm;

3. To determine if the recent past behavior construct adds to the prediction of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond that explained by attitude, subjective norm, and perceived behavioral control;

4. To determine if attitudes toward the provision of sterile syringes to known or suspected IDUs differ by gender; and

5. To explore relationships between demographic/practice characteristics and the TPB constructs (attitude, subjective norm, perceived behavioral control, willingness) and recent past behavior.

Theoretical Framework

In order to examine and predict the willingness of community pharmacists to provide sterile syringes to known or suspected IDUs, it was desirable to employ a theoretical model that can be used to predict willingness. Two models that have been used extensively to explain and predict health-related intentions (and behaviors) are the TRA and TPB. Due to the limitations of the TRA in dealing with behaviors over which people have incomplete volitional control, Ajzen (1991) proposed the TPB, which extends the TRA by including the concept of perceived behavioral control. The perceived behavioral control construct is based on the fact that many factors can interfere with control over the intended behavior, some internal to the person and some external to the person. To ensure the accurate prediction of intention (and behavior) over which individuals have limited control, it is necessary to assess the extent to which the individual is capable of exercising control over the behavior in question. Therefore, the TPB was used to predict community pharmacists' willingness to provide sterile syringes to known or suspected IDUs.

The term "willingness" was used in this study model even though the majority of research applying the TPB model uses the term "intention." Willingness can be distinguished from intention in that willingness includes a relative lack of planning or premeditation and self-focus when compared to intention (McCann, 1997; Gibbons et al., 1998). Intention encompasses a "commitment" with established plans to engage in a behavior. Willingness may be less constrained by social desirability when compared to intention (Gibbons et al., 1998). For example, "Are you willing to stay out late?" versus

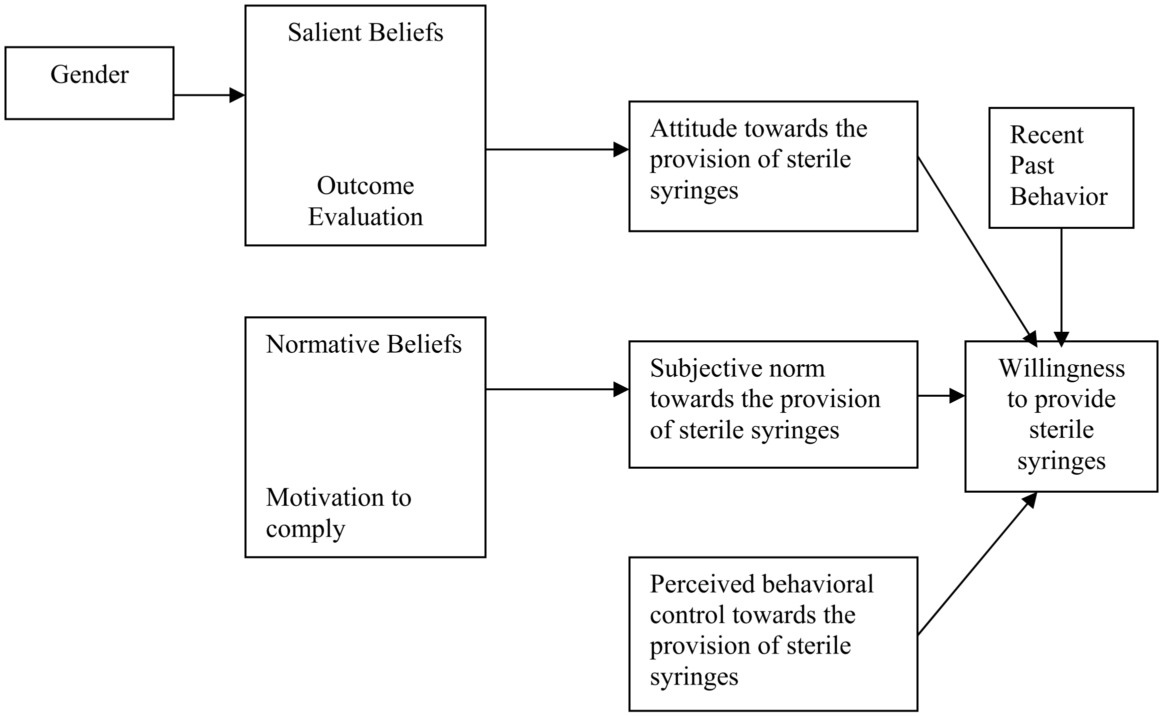
“Do you intend to stay out late?” With the controversy surrounding the provision of sterile syringes to known or suspected IDUs and the lack of official policies from the Texas Governor, Texas State Board of Pharmacy, and Texas Pharmacy Association supporting or not supporting the pharmacist’s role in the provision of sterile syringes to known or suspected IDUs, willingness may be a better construct than intention. Therefore, willingness appeared to be more appropriate for this study. The use of willingness in the application of the TPB is supported in Berger and O’Brien’s (1998) study that predicted the willingness of clinical psychology students to interact with persons living with HIV.

Since community pharmacists serve the public, community pharmacists may consider the beliefs of significant others/referent groups (e.g., pharmacy clients, other community pharmacists, pharmacy managers, State Board of Pharmacy officials) over their own attitudes in deciding whether or not to provide sterile syringes to known or suspected IDUs. In addition to the three key constructs of the TPB (i.e., attitudes, subjective norms, perceived behavioral control), two new variables were added to the study model (i.e., gender and recent past behavior).

Because of past behavior’s contribution to variance in intentions as shown in Burak’s (1994) study, the recent past behavior variable in this study model was used to help better predict community pharmacists’ willingness to provide sterile syringes to known or suspected IDUs. When past behavior was added to the TPB model, past behavior improved the predictive validity of the TPB (Leone, Perugini and Ercolani, 1999; Sheeran, Norman and Armitage, 2000).

As stated in Chapter 2, female respondents appeared more tolerant toward HIV/AIDS with Binkley et al.'s (1995) study reporting that female pharmacists felt more comfortable filling prescriptions for heterosexuals and homosexuals. Yedidia, Berry and Barr (1996) conducted a study assessing changes in physicians' attitudes toward AIDS during a residency training and found that gender was the only significant demographic variable in the final hierarchical equation, with females more willing to treat persons with AIDS. Females who were unwilling initially were more likely to increase in willingness when compared to males. In a study comprised of 131 university students, a significant main effect of gender was found with regards to a behavioral measure and an affective measure, indicating that females were more willing than males to approach a person with AIDS and had more positive responses toward persons with AIDS compared to males (Posson and Jackson, 1995). This is supported in other research using university students (Borchert and Rickabaugh, 1995; Johnson and Baer, 1996). Even though this study was targeting IDUs and not persons with AIDS specifically, the gender variable was included in the model since literature indicates that females generally have more positive attitudes toward persons with AIDS including heterosexuals, homosexuals, hemophiliacs, and IDUs. Gender can influence attitudes which in turn can influence willingness. As stated by Myers et al. (1998), female pharmacists were more likely to prioritize patient care over that of business.

Figure 3.3
Study Model



According to the study model, community pharmacists should be willing to provide sterile syringes to known or suspected IDUs if their overall attitudes toward the behavior are influenced by more beliefs concerning the positive outcomes than by beliefs concerning the negative outcomes. Also, community pharmacists should be willing to provide sterile syringes to known or suspected IDUs if they are motivated to comply with referent others perceived as supporting the behavior and if they have the resources, opportunities, and knowledge to carry out the behavior.

Hypotheses

The literature has shown that persons who hold positive attitudes toward a specific behavior, who are strongly influenced by social norms supporting the behavior in question, and who have high perceived behavioral control over the behavior in question are more likely to form an intention to perform the behavior in question.

> **H1**: Attitude, subjective norm and perceived behavioral control will explain a significant amount of variance in the willingness to provide sterile syringes to known or suspected IDUs.

Therefore, community pharmacists should be willing to provide sterile syringes to known or suspected IDUs if their overall attitudes toward the behavior are influenced by more beliefs concerning the positive outcomes than by beliefs concerning the negative outcomes.

> **H2**: Favorable attitudes will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

Also, community pharmacists should be willing to provide sterile syringes to known or suspected IDUs if they are motivated to comply with referent others perceived as supporting the intended behavior.

> **H3**: Social norms supporting the provision of sterile syringes to known or suspected IDUs will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

Community pharmacists should be willing to provide sterile syringes to known or suspected IDUs if they perceive themselves to have the resources, opportunities, and knowledge to carry out the behavior.

> **H4**: Strong perceptions of behavioral control will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

As discussed in Chapter 2, pharmacists generally support the provision of preventative HIV/AIDS healthcare services. However, pharmacists often have different opinions providing preventative healthcare services to known or suspected IDUs. It has been shown that pharmacists often use their own discretion when providing sterile syringes to known or suspected IDUs even when all external barriers have been removed.

H5: When perceived behavioral control is present, the attitude construct in the TPB model is a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct.

The TPB has been shown to significantly contribute to the prediction of healthcare professionals' intentions to provide preventative care and other professional services to patients and/or consumers above and beyond that of the TRA.

H6: The perceived behavioral control construct significantly increases the explanatory power of the regression model when only using attitude and subject norm constructs to explain willingness to provide sterile syringes to known or suspected IDUs.

The addition of the recent past behavior construct to the TPB model improves the predictive validity of the TPB above and beyond the three primary TPB constructs (attitude, subjective norm and perceived behavioral control).

H7: The recent past behavior construct significantly increases the explanatory power of the regression model using the constructs of the TPB to explain willingness to provide sterile syringes to known or suspected IDUs.

As shown in the literature, gender can influence attitudes which in turn can influence willingness. Generally, females have more positive attitudes toward persons with AIDS including heterosexuals, homosexuals, hemophiliacs, and IDUs.

H8: Female community pharmacists will have significantly more positive attitudes than male community pharmacists toward the provision of sterile syringes to known or suspected IDUs.

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CHAPTER 4

METHODOLOGY

This study was designed to determine community pharmacists' willingness to provide sterile syringes to known or suspected intravenous drug users (IDUs). As introduced in Chapter 3, the Theory of Planned Behavior (TPB) was used since the provision of sterile syringes to known or suspected IDUs is not a behavior that is completely under community pharmacists' volitional control. By determining gender and measuring community pharmacists' attitudes, subjective norms (SN), perceived behavioral control (PBC) and recent past behavior toward the provision of sterile syringes to known or suspected IDUs, researchers can better predict Texas community pharmacists' willingness to perform the behavior under consideration.

Due to the exploratory nature of this study, a nonexperimental survey design developed from information obtained from focus groups was utilized to meet the objectives of this research. Of the different types of study designs used in quantitative research, mail survey methods was used in this study. Other research methods such as telephone surveys, face-to-face drop-off surveys, and face-to-face interviews were not chosen due to time, complexity, and cost. This chapter is divided into eight major sections: Sample Selection, Instrument Development, Pilot Test, Instrument Distribution, Data Analyses, Regression Model, Objectives and Hypotheses Tests and Limitations.

SAMPLE SELECTION

The study population used for this study was active status Texas community pharmacists. Texas community pharmacists were chosen for several reasons: a small local study was appropriate because of the exploratory nature of the research; the conduction of focus groups comprising the target population was more feasible on a local level than a national level; and budget restraints required a population that is readily accessible.

Subjects eligible for inclusion in this study population were comprised of all practicing community pharmacists in the state of Texas. A complete list of active status Texas community pharmacists was made available from the Texas State Board of Pharmacy. A list of names, addresses and license status of all eligible Texas community pharmacists was obtained from the Texas State Board of Pharmacy via the Internet.

Because this study involved human subjects, an application for exemption of this project was sent to and approved by the Institutional Review Board (IRB) at the University of Texas at Austin.

Sample Size

An appropriate sample size must be determined in order for hypotheses to be given a chance of being supported when specific statistical tests are applied to the data (Kraemer and Thiemann, 1987). Kraemer and Thiemann (1987) state that the alpha level, the effect size, the sample size, the power, and the type of statistical test to be used must be considered when testing hypotheses. According to Kraemer and Thiemann, when more than one kind of statistical test is used to examine data, the sample size of the study is determined by using the formula for the statistical test with the greatest probability of rejecting the null hypothesis when it is truly false. As indicated in the literature, correlation and regression have the same power (Pedhazur, 1982; Kraemer and Thiemann, 1987; Motulsky, 1995; Fox, 1997). Kraemer and Thiemann (1987) state that "correlation and regression have exactly equal critical effect sizes and thus equal necessary sample sizes." The Pearson product-moment correlation coefficient (Pearson r) formula (n=v+2) was used.

Using a review of the literature to determine the range of effect sizes (coefficients of multiple determination) reported in the relevant studies, an effect size within this range was set. The theory is that the population effect size for the current study may be expected to fall somewhere within the vicinity of these values. Madden and colleagues (1992) compared the Theory of Reasoned Action (TRA) and the TPB and reported a coefficient of multiple determination range of R^2=0.17 to 0.66. A review of the literature revealed that the range of effect sizes from 16 previous studies using the TPB was R^2=0.18 to 0.88 (Ajzen, 1991). It is important to note that getting drunk (R^2=0.52), exercising after giving birth (R^2=0.88), exercising after a coronary event (R^2=0.30), using condoms (R^2=0.48) and losing weight (R^2=0.31 and 0.55) were the only health-related behaviors measured in the Ajzen study.

In Godin and Kok's review (1996) of the TPB's application to health-related behaviors, R^2 ranged from 0.02 (abstaining from alcohol/drugs after discharge) to 0.82 (testicular self-exam). The majority of the health-related behaviors focused on the patient perspective rather than on the healthcare professional perspective. Only one out of the 58 behavioral applications listed in the review predicted the intentions of a healthcare professional. As reported in Godin and Kok's meta-analytic review (1996), the Godin et al.'s study in 1992 predicting intention to perform clinical exams on HIV patients revealed an R^2=0.50. The range of effect sizes used to calculate the sample size in this study was based on the effect sizes from the studies reviewed that are the most similar to the proposed study (Nash, Edwards and Nebauer, 1993; Millstein, 1996; Dilorio, 1997; Berger and O'Brien, 1998). Millstein (1996) reported an R^2=0.27 when regressing TPB constructs to physicians' behavioral intentions to providing preventive services. Berger and O'Brien (1998) reported an R^2=0.26 when determining psychology students' willingness to interact with persons living with HIV. Dilorio (1997) reported an R^2=0.15 when predicting neuroscience nurses' intentions to care fore person with AIDS. Nash, Edwards and Nebauer (1993) reported an R^2=0.21 when predicting nurses' intentions to assess patients' pain. Because of the exploratory nature of this study, the effect size (coefficient of multiple determination) was set at R^2=0.22 (The average of the R^2 = 0.27+0.26+0.15+0.21/4=0.22). The alpha level of significance for all statistical tests was set to α=0.05. The power for statistical analysis was set at 80 percent. T-tests, ANOVAs, correlations and regression were primarily used in this study.

The power tables provided by Kraemer and Thiemann (1987) were used to determine the appropriate sample size for this study. In a two-tailed test, with 80 percent power, an alpha of 0.05, and an effect size of 0.22, the power tables indicated that an appropriate sample size for this study is 158. Therefore, the sample size using the Pearson r formula (n=v+2) was determined to be 160 where v=158.

With multiple regression, it is important to have at least 10 to 20 subjects per predictor variable. With four construct items (attitude, subjective norm, perceived behavioral control, and recent past behavior), a minimum of 40 subjects and a maximum of 80 subjects were desired. Therefore, a sample size of 160 subjects provides adequate power for this study.

Sampling Method

A systematic random sample of names from the list of Texas community pharmacists was used to select a sample from the study population. The sample was a probability sampling since each community pharmacist on the list provided by the Texas State Board of Pharmacy had an equal probability of selection (Henry, 1990). Pharmacist response rates for mail questionnaires in the literature have ranged from 46 to 89 percent (Katz, Draugalis and Lai, 1995 and Wright-De Aguero et al., 1998). Brown (1998) reported a response rate of 39.6 percent when assessing Texas community pharmacists' perceptions about the use of alternative therapies and their impact on compliance. Therefore, a 40 percent response rate was estimated for this study targeting Texas community pharmacists.

The formula used to determine the adjusted study sample size when taking into account the expected response rate was:

AN = N/rr

where AN = the adjusted sample size, N = number of responses needed according to the power analysis discussed in the previous section and rr = expected response rate. Once the equation was applied:

$$AN = 160/0.40$$

the adjusted sample size was N = 400. With an expected 40 percent response rate, 400 survey instruments were distributed to obtain 160 responses. After the 400 Texas community pharmacists were randomly selected from the list obtained from the Texas State Board of Pharmacy via the Internet, an additional 50 African Americans and 50 Hispanics were randomly selected from the list to ensure the sample population was representative of Texas community pharmacists. Oversampling African Americans and Hispanics brought the total sample size to 500 potential study participants (400 potential study participants + 50 additional African Americans + 50 additional Hispanics).

INSTRUMENT DEVELOPMENT

The survey instrument was developed to measure the constructs of the TPB with the addition of the recent past behavior variable (See Appendix A). In addition to measuring attitudes, subjective norms, perceived behavioral control, recent past behavior and willingness regarding the TPB, data were collected on demographic/practice characteristics (gender, age, race, years in pharmacy practice, pharmacy setting, current job-title, policy knowledge). Methods discussed by Ajzen and Fishbein (1980) were applied to develop the survey instrument for this study.

Focus Groups

According to Ajzen and Fishbein (1980), the survey instrument should be developed from information obtained from a representative sample of the population. Three focus groups were conducted with local community pharmacists not chosen to respond to the survey questionnaire. One focus group took place in Austin, Texas using local community pharmacists including the Capital Area Pharmacy Association (CAPA) members. One focus group took place in Ft. Worth, Texas, using local community pharmacists including Tarrant County Pharmacy Association (TCPA) members. One focus group took place in Dallas, Texas, using locally community pharmacists. The contact person of each local chapter was contacted to plan a recruitment strategy to ask for volunteers to participate in the focus groups. For all potential focus group volunteers, the purpose of the study, the purpose of the focus groups, the length of the focus group, and the rules of the focus group were discussed. A list of names, addresses, and/or telephone numbers of those willing to participate in the focus groups were obtained. The goal was to recruit eight to ten volunteers from each local chapter meeting to participate in the focus groups. The literature recommends recruiting six to eight volunteers (Patton, 1990; Fowler, 1993). By recruiting eight to ten volunteers for each focus group, the researcher strove to have a minimum of six community pharmacists attending each focus group. Once focus group participants were identified from the recruitment meeting, a focus group meeting was scheduled.

Each focus group participant was contacted via telephone or email the night before the scheduled focus group meetings to remind each participant of the time, date, and location. The focus group participants' perceptions, experiences, and feelings regarding the provision of sterile syringes to known or suspected IDUs were used to develop the survey instrument.

In order to obtain salient beliefs, salient referents and perceived behavioral control, each focus group lasted one to two hours and covered the following items:

Salient Beliefs

1. Identify perceived advantages associated with community pharmacists providing sterile syringes to known or suspected IDUs.
2. Identify perceived disadvantages associated with community pharmacists providing sterile syringes to known or suspected IDUs.
3. Identify other perceived advantages and disadvantages associated with community pharmacists providing sterile syringes to known or suspected IDUs.

Salient Referents

4. Identify individuals or groups who would approve of community pharmacists providing sterile syringes to known or suspected IDUs.
5. Identify individuals or groups who would not approve community pharmacists providing sterile syringes to known or suspected IDUs.
6. Identify other individuals or groups who would or would not approve community pharmacists providing sterile syringes to known or suspected IDUs.

Perceived Behavioral Control

7. Identify perceived factors or circumstances that would make it easier to provide sterile syringes to known or suspected IDUs.
8. Identify perceived factors or circumstances that would make it more difficult to provide sterile syringes to known or suspected IDUs.

To follow Ajzen and Fishbein's (1980) recommendation, five to nine of the most frequently mentioned outcomes were selected to construct the survey instrument.

Independent and Dependent Variables

The major constructs of interest in this study were attitude, subjective norms, perceived behavioral control, recent past behavior and willingness. Attitude, subjective norms, and perceived behavioral control were measured from belief outcomes obtained from the focus groups and from global questions (direct measures) from the survey instrument. Willingness was measured from one global question (direct measure) from the survey instrument. Recent past behavior was measured from one global question (direct measure) from the survey instrument. Ajzen and Fishbein (1980) recommend measuring attitudes, subjective norms and perceived behavioral control on both a global (direct) level and a more indirect (belief-based) level. Direct measure attitude items are gleaned from the existing literature, whereas, salient beliefs used to measure belief-based contructs are obtained from the targeted population via focus groups. According to Ajzen, moderate correlations should exist between direct and belief-based constructs of the TPB. Even though direct measures can accurately measure attitudes, subjective norms and perceived behavioral control, belief-based measures can gain more insight into the cognitive foundation. Researchers can gain insight as to why people hold specific attitudes, subjective norms and perceptions of behavioral control by taking a closer look at salient beliefs. Therefore, to follow Ajzen and Fishbein's (1980) recommendation, direct and belief-based attitude, subjective norm and perceived behavioral control measures were used in this study.

In one study in particular, Valois and associates (1993) tested the psychometric properties of a scale to assess perceived behavioral control. A total of 217 students enrolled in a certificate program in Law were administered questionnaires that measured belief-based perceived behavioral control, global perceived behavioral control, and intentions to continue with the Certificate of Law. The authors found that the belief-based measure provides more information than the global perceived behavioral control dimension due to the possibility of identifying the salient beliefs linked with the presence of resources and opportunities influencing or hindering the performance of the behavior. Direct measures and belief-based measures were elicited in this study to determine the relationship between the two measures per construct item.

Independent Variables - *Attitude*. Fishbein and Ajzen (1980) define attitude as "a learned disposition to respond in a consistently favorable or unfavorable manner with respect to a given object." Attitude toward a behavior is the positive or negative evaluations of performing the behavior. There are three basic features of attitudes: attitudes are learned, predisposed actions and such actions are consistently favorable or unfavorable toward the object. "Attitude" for this study was determined by beliefs (b_i) about the provision of sterile syringes to known or suspected IDUs and by the evaluation (e_i) of attributes (i.e., $A=\Sigma e_i b_i$). Belief outcomes (b_i) were elicited from the focus groups. Focus group participants were asked to identify perceived advantages and disadvantages associated with community pharmacists providing sterile syringes to known or suspected IDUs. Focus group participants were expected to identify perceived outcomes regarding the provision of sterile syringes to known or suspected IDUs. Once salient beliefs were identified from the focus groups, belief strengths and outcome evaluations were determined from the study sample. Ajzen and Fishbein (1980) recommend measuring the belief strength of belief outcomes by asking subjects "likelihood" questions (e.g., How likely will providing sterile syringes to known or suspected IDUs result in [belief outcome -n]?). The belief strength statements were rated by using Osgood's bipolar scale which is recommended by Ajzen and Fishbein (1980). For the belief strength measurement, this 7-point semantic differential scale ranged from unlikely (–3) to likely (+3) and then was summed across all belief strength statements to determine the behavioral belief score. The evaluative component (e_i) of the belief outcome was measured by asking a series of questions rating outcome evaluations on a 7-point semantic differential scale using a set of bipolar evaluative adjective scales, bad(-3)/good(+3). For example, "How good or bad do you feel each of the following consequences (belief outcomes –n) would be if you provided sterile syringes to known or suspected IDUs." The outcome evaluation values were summed to determine the outcome evaluation score. The respondent's belief-based attitude toward the provision of sterile syringes to known or suspected IDUs was determined by multiplying the respondents evaluation of each of the belief outcomes by the respondent's belief strength and then summing the products for the total set of beliefs. For example, if a respondent believes that providing sterile syringes to known or suspected IDUs would encourage drug use is very unlikely (-3) and that the outcome regarding the encouragement of drug use is very bad (-3), then the cross-product for that belief for the respondent is +9. It is important to note that even though the outcome to encourage drug use is very bad (-3), the cross-product to the belief is positive since the respondent believes the belief to be very unlikely (-3). If a respondent believes that providing sterile syringes to known or suspected IDUs would reduce HIV is very likely (+3) and that the outcome regarding that belief is very good (+3), then the cross product for that belief is +9. Therefore, both cross-products for the two beliefs would positively influence the respondent's belief-based attitude score.

The survey instrument also contained global questions (direct measures) addressing the respondents' attitudes toward the provision of sterile syringes to known or suspected IDUs by asking a series of questions: "Providing sterile syringes to known or suspected IDUs will be _____." Texas community pharmacists were asked to respond to the statements using a 7-point bipolar scale consisting of evaluative adjectives, such as bad(-3)/good(+3), harmful(-3)/beneficial(+3), useless(-3)/useful(3), foolish(-3)/wise(+3), worthless(-3)/valuable(+3) and punishing(-3)/rewarding(+3). The items were summed to form a single score.

Subjective Norm. Ajzen and Fishbein (1980) define subjective norm as "a person's belief that most of his/her important others think he/she should (or should not) perform the behavior in question." A person considers whether specific groups or individuals think he/she should or should not perform a behavior and then uses that information to make his/her decision to perform the behavior. Subjective norms were measured in a similar way to that of attitudes. To measure subjective norms, Ajzen and Fishbein use $SN = \Sigma n_i m_i$, where n_i is the normative belief and m_i is the motivation to comply. The first component in the subjective norm equation is the person's perception of the most salient group norms. The normative belief component is the belief of what other groups or individuals think the person should do. Salient referents were obtained from the previously mentioned focus groups. Focus group participants were asked to list groups or individuals who would approve or disapprove of the respondents' provision of sterile syringes to known or suspected IDUs. For example, "What groups or individuals would influence your decision to provide sterile syringes to known or suspected IDUs?" Salient referents were then used to development statements to measure normative beliefs and motivation to comply. Normative beliefs (n_i) were measured by asking a series of questions using Osgood's bipolar 7-point semantic differential scale ranging from unlikely(-3)/likely(+3). For example, "How likely is it that (salient referent –n) would think you should provide sterile syringes to known or suspected IDUs?" Similar to the attitude measurements, the sum of the normative beliefs made up the normative score.

The second component in measuring subjective norms is the person's motivation to comply ($SN = \Sigma n_i m_i$). The motivation to comply (m_i) component is the belief that a person will do what others (referent groups) think he/she should do. Motivation to comply is influenced by the individual's personality and the characteristics of the referents. Motivation to comply is measured by asking a series of questions. For example, "Generally, how likely are you willing to do what (salient referent –n) would want you to do?" The respondents were asked to respond to the questions using Osgood's bipolar 7-point semantic differential scale ranging from unlikely(-3)/likely(+3). The sum of the motivation to comply responses made up the motivation to comply score. The subjective norm score was then calculated by summing the products of each normative belief by its corresponding motivation to comply response. For example, if a respondent indicates that IDUs are very likely (+3) to think that the respondent should provide sterile syringes to known or suspected IDUs and the respondent is very unlikely (-3) to do what IDUs would want him/her to do, then the belief-based cross-product for that referent group for the respondent is –9. Therefore, the cross-product for that normative belief would negatively influence the respondent's belief-based subjective norm score.

A single item on the survey instrument directly measured the respondent's subjective norm by asking the following: "If I provide sterile syringes to known or suspected IDUs, most people who are important to me would approve." The respondents were asked to respond to the question using Osgood's bipolar 7-point semantic differential scale ranging from disagree(-3)/agree(+3).

Perceived Behavioral Control (PBC). Perceived behavioral control is the perceived control that an individual has in performing the behavior in question. It is defined as the ease or difficulty of performing a specified behavior. For this study, the perceived behavioral control was defined as the perceived ease or difficulty for a community pharmacist to provide sterile syringes to known or suspected IDUs. For this study, perceived behavioral control was operationalized as $PBC = \Sigma c_i p_i$,, where c_i is the control belief that a specific factor will increase or reduce the difficulty of providing sterile syringes to known or suspected IDUs and p_i is the perceived power of a particular control factor to facilitate or inhibit performance of the behavior. Focus group participants were asked to determine what would make it easy and what would make it difficult to provide sterile syringes to known or suspected IDUs. The information obtained was used to develop control belief statements and perceived statements for the survey instrument. Control beliefs were measured by asking a series of questions. For example, "Will (control belief –n) make it easy or difficult for you to provide sterile syringes to known or suspected IDUs?" The respondents were asked to respond to the questions using Osgood's bipolar 7-point semantic differential scale ranging from difficult(-3)/easy(+3). The sum of the control belief responses made up the control belief score. Perceived power was measured by asking a series of questions. For example, "How much control do you feel you have over (control belief –n) when it comes to providing sterile syringes to known or suspected IDUs?" The respondents were asked to respond to the questions using Osgood's bipolar 7-point semantic differential scale ranging from no control(-3)/complete control(+3). The sum of the perceived power responses made up the perceived power score. Perceived behavioral control was then calculated by summing the products of each control belief and its corresponding perceived power score. For example, if a respondent feels that support from the community would make it very easy (+3) for the respondent to provide sterile syringes to known or suspected IDUs and he/she also feels that he/she had no control (-3) over support from the community, then the cross-product for the belief-based perceived behavioral control item for the respondent is –9. Therefore, the cross-product for that perceived behavioral control item would negatively influence the respondent's belief-based perceived behavioral control score.

As with attitude and subjective norms, perceived behavioral control was directly measured with two items on the survey instrument. The first question determined the ease or difficulty in providing sterile syringes to known or suspected IDUs and the second question measured whether or not respondents feel that they have complete control over providing sterile syringes to known or suspected IDUs. Both questions required a response to Osgood's bipolar 7-point semantic differential scale ranging from disagree (-3)/agree(+3). The scores of the two items were summed to form a single score.

Recent Past Behavior. Recent past behavior was measured by asking the respondents to answer one item on the survey instrument, "How often did you provide sterile syringe(s) to a known or suspected IDU in the past 3 months?" Respondents used a bipolar 7-point semantic differential scale ranging from never(-3)/always(3) to respond to this item.

Demographic/Practice Characteristics. Gender was determined with one item on the survey instrument. Age was determined with one item asking the respondents to complete the year in which the respondents were born. Ethnic background was determined with one item inquiring about the respondents' racial identity. Response options included: 1) African-American/Black; 2) American Indian or Alaskan Native; 3) Asian-American/Oriental; 4) Caucasian-American/White; 5) Mexican-American or Other Hispanic Origin; and 6) Other (please specify). Respondents were asked to record their years in pharmacy practice by completing the following question: "How many years have you been practicing pharmacy?" Current job-title at his/her primary place of employment was determined with one item on the survey instrument. Response options included: 1) Pharmacy Owner/Partner; 2) Pharmacy Manager; 3) Staff Pharmacist; 4) Relief Pharmacist; and 5) Other (please specify). Pharmacy setting was determined with one item inquiring about the respondent's practice setting at his/her primary place of employment. Response options included: 1) community-independent; 2) community-chain; 3) community-clinic; and 4) Other (please specify). Included were two questions asking respondents to record the number of hours worked per week at their primary place of employment and the number of hours per week spent dispensing and interacting with patients. Policy knowledge was determined by asking the respondents one global question on the survey instrument, "Are you aware of an official/unofficial policy regarding the provision of sterile syringes to known or suspected IDUs at your pharmacy?" If the respondents marked "yes" to the above question, the respondents were asked to indicate whether or not their official/unofficial pharmacy policy supports or does not support the provision of sterile syringes to known or suspected IDUs. Also, if the respondents were aware of an official/unofficial policy, the respondents were to indicate if the policy is official or unofficial or mark "don't know." One item asked respondents to identify general procedures for screening customers when selling syringes. Responses included: 1) Do not screen, 2) Require Diabetic Information, 3) Require picture identification, 4) Require name/address, 5) Consider time of day, 6) Ask customer(s) why they want them, 7) Consider familiarity with customer and 8) Other (please specify).

One item asked respondents to describe in his/her own words how you (respondent) suspect or know an individual is an IDU. This item was the only open-ended item on the survey instrument.

Dependent Variable - *Willingness*. As discussed in Chapter 2, "willingness," was used in this study. Willingness is distinguished from intention in that willingness includes a relative lack of planning or premeditation and self-focus when compared to intention, whereas, intention encompasses a "commitment" with established plans to engage in a behavior (Gibbons et al, 1998). Therefore, willingness appeared to be more appropriate for this study. The use of willingness in the application of the TPB was supported in Berger and O'Brien's study (1998) predicting the willingness of clinical psychology students to interact with persons living with HIV.

Since no established methods existed for measuring willingness, willingness was measured similarly to intention in the TPB. For the purpose of this study, the willingness to provide sterile syringes to known or suspected IDUs was directly measured with one item: "I am willing to provide sterile syringes to known or suspected IDUs." Respondents used Osgood's bipolar 7-point semantic differential scale ranging from unlikely(-3)/likely(+3) to respond to this item. Ajzen and Fishbein (1980) define behavioral intention as "a measure of the likelihood that a person will engage in a given behavior." As implied by the TPB, intention is influenced by attitudes, subjective norms and perceived behavioral control [$I=(w_1)(A) + (w_2)(SN) + (w_3)(PBC)$]. Since "willingness" was measured instead of intention in this study, willingness was operationalized as $W=(w_1)(A) + (w_2)(SN) + (w_3)(PBC) + (w_4)(PB)$, where PB = recent past behavior. Weighted sums of attitude, subjective norms, perceived behavioral control and recent past behavior made up the predicted willingness value. Multiple regression provided beta weights for the predicted willingness calculation.

The final statement on the survey instrument stated that if the respondent would like to receive results of this study once it was completed, he or she was instructed to email Jay H. Mashburn at jhackburn@yahoo.com or send a postcard to the following address: Jay H. Mashburn, College of Pharmacy – Mail Code A1930, University of Texas at Austin, Austin, Texas 78712.

PILOT TEST

A pilot test of the survey was undertaken to identify issues concerning length, face validity, content, clarity, and format/organization. Twelve participants were selected in Austin, Texas. Names, addresses and telephone numbers were obtained from the community pharmacists who were willing to participate in the pilot test. The volunteers were a representative sample of the community pharmacists to be surveyed. The volunteers did not participate in the actual study. Volunteers for the pilot test were asked to write comments on the survey instrument regarding the length of time to complete the survey, if the items' meaning and relevance were self-evident, and if the items adequately covered the topic under investigation as well as relevant issues regarding the clarity and format/structure of the instrument. Respondents were asked to make a copy of the survey instrument to keep and to return the completed survey instrument in the self-addressed postage-paid envelope along with his/her comments. Written comments were reviewed and telephone calls were made to each volunteer to discuss the survey more thoroughly. After necessary modifications were made, a final draft of the instrument was then developed.

INSTRUMENT DISTRIBUTION

The following materials were sent at specified times to the 500 randomly selected Texas community pharmacists from the mailing list obtained from the Texas State Board of Pharmacy via the Internet:

1. First mailing of survey questionnaire along with a cover letter (Appendices A and B); and
2. Second mailing of survey questionnaire with a revised cover letter (Appendices A and C).

This procedure included two separate mailings as recommended by Salant and Dillman (1994).

First Mail Out - The Cover Letter and Survey Instrument

The first contact with the potential respondents was the first mailing of the survey instrument (Appendix A) and its cover letter (Appendix B). Each questionnaire was not marked with an identification number to ensure anonymity. Potential respondents were asked to complete the questionnaire and return it within two weeks. The cover letter and survey instrument were mailed via first class with a self-addressed postage-paid return envelope. Salant and Dillman (1994) state that the practice of using return postage-paid envelopes may increase response rates by 2 to 4 percent over rates with business reply envelopes. In addition, Fox, Crask and Kim (1988) support the view that first class mailings with self-addressed postage-paid envelopes increase response rates. According to Fox and associates, university-sponsored research also had greater response rates than research sponsored by other means.

The first paragraph of the cover letter described the purpose of the survey. Respondents were introduced to the ideas that blood-borne pathogens and intravenous drug use pose major threats to our society and that the provision of sterile syringes to intravenous drug users may help to reduce the spread of HIV and other blood-borne pathogens (e.g., hepatitis) among IDUs and other populations affected by intravenous drug use-related HIV and other blood-borne pathogen infections.

The second paragraph described the purpose of the survey informed the respondents that participation in the study was on a voluntary basis, and provided a statement designed to convince the respondents that the results of the study would ultimately impact the level of involvement of community pharmacists in public health services. The importance of the respondents' participation in the study was expressed along with the return date for the completed questionnaire. The anonymity of participants was emphasized in the third paragraph. As shown in a study by Tyagi (1989), a high level of voluntary response is likely if anonymity or confidentiality is offered. Thus, anonymity and confidentiality was offered.

The last paragraph of the cover letter explained that the study was being conducted as partial fulfillment of the requirements for a dissertation, and provided the respondents with a telephone number at the College of Pharmacy, The University of Texas at Austin if they had any questions about the study or the survey instrument. The cover letter was printed on College of Pharmacy letterhead and signed by both researchers.

Second Mail Out – Revised Cover Letter and Survey Instrument

The final contact with potential respondents was the second mailing of the questionnaire (Appendix A). A revised cover letter (Appendix C) was similar to the first cover letter but modified to explain the second mailing. The final survey instrument was mailed to all 500 potential study participants. The final survey instrument and revised cover letter was mailed via first-class with a self-addressed postage-paid return envelope.

DATA ANALYSES

The survey data was coded and entered into SPSS statistical package software. Using an IBM-compatible computer, the data was analyzed using the SPSS (2000) statistical software program for Windows. Each statistical test involving attitudes, subjective norms, and perceived behavioral control was performed on both belief-based measures and their respective direct measures.

Reliability of the scales used in the survey instrument was tested using Cronbach's alpha. A Cronbach alpha was considered acceptable at α=0.6 (Robinson, Shaver and Wrightsman, 1991).

Appropriate descriptive statistics (frequency distributions, means and standard deviations) were obtained for selected variables to provide a description of the sample data. Frequencies were obtained for all categorical data (gender, race, current job-title, pharmacy practice setting, and policy knowledge). Means and standard deviations were obtained for all interval data (belief-based and direct measures for attitudes, subjective norms, and perceived behavioral control, willingness, recent past behavior, age, years in practice, hours worked per week at primary place of employment and hours work per week dispensing medication).

T-tests were used to evaluate differences between means among those community pharmacists that are willing to provide sterile syringes to known or suspected IDUs and those that are not with regards to significant predictors of attitudes, subjective norms, and perceived behavioral control. T-tests were also used to evaluate differences between means among men and women with regards to attitudes.

A correlation analysis was performed to determine if there was a significant association between age and the TPB constructs (attitude, subjective norm, perceived behavioral control, willingness) and recent past behavior as well as years in practice and the TPB constructs and recent past behavior. A correlation analysis was performed to determine if there was a significant association between hours worked in primary place of employment and the TPB constructs (attitudes, subjective norms, perceived behavioral control, willingness) and recent past behavior as well as number of hours worked and the TPB constructs and recent past behavior.

Multiple regression analysis was used to regress willingness on the TPB constructs (attitudes, subjective norms, perceived behavioral control) and recent past behavior to determine significant predictors of Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs for both belief-based and direct measure constructs.

Theoretically, the data obtained from the survey instrument using Osgood's bipolar 7-point semantic differential scale was at the ordinal level. However, many scientific researchers treat ordinal data as interval data because many researchers believe that the discrepancy is not significant enough to use nonparametric tests (Polit and Hungler, 1995).

REGRESSION MODEL

The main objective of this study was to develop a regression model using the dimensions of the TPB and recent past behavior to predict Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs. If this regression model can help to explain Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs, this study may provide the pharmacy profession with some practical information that will better define community pharmacists' involvement in harm reduction strategies.

The regression model used in this study was (Pedhazur, 1982):

$$Y = b_0 U + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + E$$

where U was the unit vector, X_1 was the independent variable attitude, X_2 was the independent variable subjective norm, X_3 was the independent variable perceived behavioral control and X_4 was the independent variable recent past behavior. Y is the dependent variable "Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs."

OBJECTIVES AND HYPOTHESES TESTS

The following hypotheses and statistical tests were associated with Objective 1:

Objective 1: To explore the utility of the TPB (attitude, subjective norm, perceived behavioral control) and the predictive strength of each TPB component in predicting community pharmacists' willingness to provide sterile syringes to known or suspected IDUs.

H1: Attitude, subjective norm and perceived behavioral control will explain a significant amount of variance in the willingness to provide sterile syringes to known or suspected IDUs.

H2: Favorable attitudes will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

H3: Social norms supporting the provision of sterile syringes to known or suspected IDUs will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

H4: Strong perceptions of behavioral control will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

H5: When perceived behavioral control is present, the attitude construct in the TPB model is a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct.

For **H1**, multiple regression was used to regress willingness on the TPB constructs (attitude, subjective norm, perceived behavioral control) to determine the strongest predictors of willingness to provide sterile syringes to known or suspected IDUs. The R^2 value (coefficient of multiple determination) from the regression analysis was examined to determine the overall significance of the TPB in predicting willingness to provide sterile syringes to known or suspected IDUs.

For **H2**, **H3**, and **H4**, beta weights for attitudes, subjective norms and perceived behavioral control were examined to determine each construct's (attitudes, subjective norm, perceived behavioral control) positive/negative relationship and significance in predicting willingness to provide sterile syringes to known or suspected IDUs.

If the belief-based attitude construct was a significant predictor of willingness to provide sterile syringes to known or suspected IDUs, t-tests were conducted on each salient belief, each respective outcome evaluation and each product (salient belief X evaluation) to determine which salient beliefs, evaluations, and products are significantly different for those who are willing and those who are not willing.

If the belief-based subjective norm construct was a significant predictor of willingness to provide sterile syringes to known or suspected IDUs, t-tests were conducted on each normative belief, each respective motivation to comply and each product (normative belief X motivation to comply) to determine which normative beliefs, motivations to comply, and products are significantly different for those who are willing and those who are not willing.

If the belief-based perceived behavioral control construct was a significant predictor of willingness to provide sterile syringes to known or suspected IDUs, t-tests were conducted on each control belief, each respective perceived power, and each product (control belief X perceived power) to determine which control beliefs, perceived power, and products are significantly different for those who are willing and those who are not willing.

Those willing to provide sterile syringes to known or suspected IDUs had a score between +1 to +3 on the 7-point scale ranging from unwilling(-3) to willing(+3) to the question –"I am willing to provide sterile syringes to known or suspected IDUs to help prevent the spread of HIV and other blood-borne pathogens (e.g., hepatitis)." Non-willing respondents had a willingness score ranging from –3 to –1. Neutral responders (score of 0) were not included in the t-test analyses.

For **H5**, multiple regression was used to regress willingness on the belief-based constructs of the TPB (attitude and subjective norm), when perceived behavioral control was present. Only respondents with perceived behavioral control scores between +1 and +63 were used in this regression analysis. Multiple regression was also used to regress willingness on the direct measure constructs of the TPB (attitude and subjective norm), when perceived behavioral control was present. Perceived behavioral control was considered present when respondents scored between +1 to +6 when summing the means of the two direct measure perceived behavioral control items. For both models using belief-based constructs and direct measure constructs, the beta weight of the attitude variable was examined to assess if the attitude construct in the regression model was a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct.

The following hypothesis and statistical test were associated with Objective 2:

Objective 2: To determine if the perceived behavioral control construct added to the prediction of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond that explained by attitude and subjective norm;

H6: The perceived behavioral control construct significantly increases the explanatory power of the regression model when only using attitude and subject norm constructs to explain willingness to provide sterile syringes to known or suspected IDUs.

The analysis for **H6** consisted of a hierarchical multiple regression analysis. To determine if the addition of perceived behavioral control accounted for a significant increase in the variance explained beyond the TRA constructs (attitude, subjective norm), perceived behavioral control was entered in a last separate step (after the TRA constructs). The beta weight of the perceived behavioral control construct and the change in R^2 were examined to determine the significance of the contribution of the perceived behavioral control construct to the regression model.

The following hypothesis and statistical test were associated with Objective 3:

Objective 3: To determine if the recent past behavior construct added to the prediction of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond that explained by attitude, subjective norm and perceived behavioral control.

H7: The recent past behavior construct significantly increases the explanatory power of the regression model using the constructs of the TPB to explain willingness to provide sterile syringes to known or suspected IDUs.

The analysis for **H7** consisted of a hierarchical multiple regression analysis. To determine if the addition of the recent past behavioral construct accounted for a significant increase in the variance explained beyond the TPB constructs (attitude, subjective norm, perceived behavioral control), recent past behavior was entered in a last separate step (after the TPB constructs). The beta weight of the recent past behavior construct and the change in R^2 were examined to determine the significance of the contribution of the recent past behavior construct to the regression model.

The following hypothesis and statistical tests were associated with Objective 4:

Objective 4: To determine if attitudes toward the provision of sterile syringes to known or suspected IDUs differed by gender.

H8: Female community pharmacists will have significantly more positive attitudes than male community pharmacists toward the provision of sterile syringes to known or suspected IDUs.

Analysis for **H8** consisted of a two-tailed t-test to test the mean difference in attitudes between female and male respondents. If a significant difference in mean attitudes existed between female and male respondents, t-tests were conducted on each salient belief, each respective outcome evaluation and each product (salient belief X evaluation) to determine which salient beliefs, evaluations, and products were significantly different for female and male respondents.

The following statistical tests were associated with Objective 5:

Objective 5: To explore relationships between demographic/practice characteristics and the TPB constructs (attitude, subjective norm, perceived behavioral control, willingness) and recent past behavior.

T-tests were used to determine if significant differences in means of subjective norms, perceived behavioral control, willingness and recent past behavior existed between female and male respondents. For those respondents who are knowledgeable about their pharmacy's policy regarding the provision of sterile syringes to known or suspected IDUs, t-tests were conducted to determine if significant differences in means of attitudes, subjective norms, perceived behavioral control, willingness and recent past behavior existed between respondents working under a policy supporting the provision of sterile syringes and respondents working under a policy not supporting the provision of sterile syringes.

ANOVAs were used to determine if significant differences between ethnic backgrounds, pharmacy setting, and current job-title existed among the TPB constructs (attitudes, subjective norms, perceived behavioral control, willingness) and recent past behavior.

LIMITATIONS

All data were collected at one point in time. The TPB assumes a causal relationship among the variables tested. Because of the cross-sectional nature of the data, causality was not possible.

Due to the controversial nature of the subject matter, social desirability factors may cause respondents to modify their self-reports in a favorable direction. As with self-reported data such as mail surveys, there were limitations which may affect the generalizability of the results. The scope of this study was restricted to Texas community pharmacists. Therefore, results could not be extrapolated to community pharmacists nationwide. The sample in this study was voluntary, and therefore, may be not representative of all Texas community pharmacists.

It is important to note the limitations of using multiple regression analysis. When a particular model is used to study the relationship between variables, it is generally not known in advance whether the model is appropriate in that it satisfies all of the assumptions necessary for regression analysis. For regression to be considered appropriate, the model must meet the required assumptions of linearity, normality and homoscedasticity. Histograms, partial plots and scatterplots were examined to determine if the assumptions were met.

One problem is the unstable nature of the regression weights. According to Cohen (1988), regression weights change with different samples and when independent variables are added or subtracted from the model. This instability can result in problems in interpreting the relative contributions of the independent variables to the dependent variable. The addition of other independent variables to the regression equation can also change the value of R^2, the coefficient of multiple determination, which is the percent of variance in the dependent variable accounted for by the independent variables in combination. Since R^2 is used to calculate the F test of significance, changing values of the F test can also result in data interpretation problems.

The problem of multicollinearity is also associated with a multiple regression model (Fox, 1997). Multicollinearity refers to the intercorrelations among independent variables. High multicollinearity in a multiple regression model severely limits the size of R, the multiple correlation coefficient. This makes interpreting the importance of a given independent variable difficult because the effects of the independent variables are confounded. Correlation matrices, diagnostic analysis of eigenvalues and condition indexes, and analysis of Variance Inflation Factors (VIF) and tolerance values were used to determine if collinearity of the predictor variables existed.

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CHAPTER 5

RESULTS

The purpose of this study was to achieve a better understanding of why community pharmacists' are willing or not willing to provide sterile syringes to known or suspected intravenous drug users (IDUs). A better understanding of this health-related intention (willingness) formation was achieved by using the Theory of Planned Behavior (TPB) (Ajzen and Fishbein, 1980). The five primary objectives of this study were:

1. To explore the utility of the TPB (attitude, subjective norm, perceived behavioral control) and the predictive strength of each TPB component in predicting community pharmacists' willingness to provide sterile syringes to known or suspected IDUs;

2. To determine if the perceived behavioral control construct adds to the prediction of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond that explained by attitude and subjective norm;

3. To determine if the recent past behavior construct adds to the prediction of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond that explained by attitude, subjective norm and perceived behavioral control;

4. To determine if attitudes toward the provision of sterile syringes to known or suspected IDUs differ by gender; and

5. To explore relationships between demographic/practice characteristics and the TPB constructs (attitude, subjective norm, perceived behavioral control, willingness) and recent past behavior.

Using the TPB requires conducting focus groups to develop a questionnaire that can be used to evaluate the research question(s). This chapter describes the findings from the three focus groups used to develop the questionnaire and the development of the questionnaire based on the focus group results. This chapter also describes the survey response rate, descriptive statistics of the sample data, tests of hypotheses, and the development of the regression model using the constructs of the TPB.

Focus Group Results

Three focus groups were conducted using local community pharmacists. Focus groups took place in Austin, Dallas, and Fort Worth, Texas. Eight community pharmacists (four women and four men) participated in the Austin, Texas focus group, seven community pharmacists (four women and three men) participated in the Dallas, Texas focus group and two community pharmacists (one woman and one man) participated in the Fort Worth, Texas focus group. Appendix D describes the structure of the focus groups which were based on recommendations by Ajzen and Fishbein (1980). The moderator greeted each participant and provided a brief introduction of the purpose and goals of the focus group session. Consent forms were signed and dated by each participant and the moderator. Snacks and beverages were provided during each focus group session. Participants were reminded that the session would be audiotaped for transcription purposes only. Participants were given the rules of the focus group session and were asked brief introductory questions to establish a set comfort level for the group. Participants were then given time to record their answers on paper to the six key focus group questions. Participants were asked:

1. What do you think are some of the advantages associated with community pharmacists providing sterile syringes to known or suspected IDUs?
2. What do you think are some of the disadvantages associated with community pharmacists providing sterile syringes to known or suspected IDUs?

3. Are there any individuals or groups who would approve of community pharmacists providing sterile syringes to known or suspected IDUs?

4. Are there any individuals or groups who would not approve community pharmacists providing sterile syringes to known or suspected IDUs?

5. What do you think would make it easier to provide sterile syringes to known or suspected IDUs?

6. What do you think would make it difficult to provide sterile syringes to known or suspected IDUs?

The written responses to the key questions were then discussed. The final question allowed participants to discuss any issues or concerns they felt were not discussed during the focus group session. The Austin, Texas focus group lasted two hours, the Dallas, Texas focus group lasted one hour and thirty minutes, and the Fort Worth, Texas focus group lasted one hour. Each participant in the Austin, Texas focus group received $25.00 cash at the end of the focus group session. Each participant in the Dallas, Texas and Fort Worth, Texas focus groups received a free dinner.

The transcriptions and written responses were then analyzed for emerging themes. Once all responses to the questions were examined, key words and phrases were grouped together into categories so that the frequency of responses could be tabulated. Table 5.1 shows the responses to the key questions and the frequency of responses.

Table 5.1
Responses to Key Questions by Focus Group Participants for Survey Development (N=17)

Key Questions Asked	Responses (frequency)
Advantages of providing syringes to IDUs	Decreases spread of disease (HIV, hepatitis) (16)
	Provides counseling/referral opportunities (6)
	Increases syringe accessibility for IDUs (6)
	Decreases healthcare costs (HIV, hospital) (5)
	Lowers stigma associated with IDUs (5)
	Increases syringe sales (3)
	Sanitizes IDU community/Promotes safe drug use (3)
	Decreases theft/crime (2)
	Increases use of sharps containers (2)
Disadvantages of providing syringes to IDUs	Increases unfavorable clientele/ Decreases reputation of store (16)
	Enables drug use (11)
	Requires more time from pharmacists (10)
	Increases health and safety concerns for staff (5)
	Increases theft/crime (5)
	Goes against pharmacists' moral standards (3)
	Has negative impact on the community (3)
	Increases healthcare costs (pharmacy, hospital) (2)
	Increases number of dirty syringes in circulation (2)
	Poses conflict with pharmacy management (1)
	Increases legal issues/ramifications (1)
Individuals/groups who support providing syringes to IDUs	Health organizations (CDC, HIV/AIDS groups) (13)
	Professional organizations (APhA, AMA) (11)
	IDUs (6)
	Church/clergy (5)
	Employer/Management (5)
	Community groups (5)
	Regulatory agencies (3)
	Family (3)
	Friends (2)
	Social Medicine Groups (2)
	Politicians (2)
	Needle companies (1)
	Needle disposal companies (1)
	Police (1)

Table 5.1 (continued)
Responses to Key Questions by Focus Group Participants for Survey Development (N=17)

Key Questions Asked	Responses (frequency)
Individuals/groups who do not support providing syringes to IDUs	Church/clergy (10) Regulatory agencies (9) Employer/Management (7) Community groups (6) Family (6) Professional organizations (APhA, AMA) (5) Friends (5) "Just Say No" Campaign (3) Politicians (3)
Factors that make it easy to provide syringes to IDUs	Support from employer/Store policy (15) Support from regulatory agencies (7) Support from community (5) Support from staff/peers (5) Evidence to show positive impact of syringe provision (3) Demeanor of IDU (Politeness) (2) Designated area for syringe disposal (2) Designated area to serve IDU (2) Support from church (2) A mandatory return of used syringes (1) Support of family (1) Opportunities to refer IDUs to treatment (1)
Factors that make it difficult to provide syringes to IDUs	Legal issues/ramifications (12) Lack of support from employer/store policy (10) Lack of time (8) Lack of support from community (5) Lack of support from staff/peers (5) Personal ethical and moral issues (5) Lack of support from family (5) Lack of church support (3) Safety concerns (3) No syringe disposal options (1) No reimbursement (1)

Note: IDU = Intravenous Drug User.

The goal was to obtain the five to nine most mentioned behavioral beliefs, normative beliefs, and control beliefs to develop the survey. Responses to the two questions regarding advantages and disadvantages of providing sterile syringes to known or suspected IDUs became the behavioral beliefs. Totally, twenty advantages and disadvantages were mentioned. However, ten advantages and disadvantages were mentioned five times or more and were used as the behavioral beliefs. Twenty-three individuals/groups were mentioned as those who would support or not support the provision of sterile syringes to known or suspected IDUs and nine were used as normative beliefs. Twenty-three factors were mentioned that would make it easy or difficult for community pharmacists to provide sterile syringes to known or suspected IDUs and seven were used as control beliefs. All beliefs used to develop the survey were mentioned five or more times during the focus group sessions.

Focus group participants were asked if they had any difficulties in responding to the statement, "I am willing to provide sterile syringes to known or suspected IDUs," based on a 7-point bipolar scale ranging from very unwilling (-3) to very willing (+3). None of the participants reported any difficulties with the scale.

The focus groups revealed that the provision of sterile syringes to known or suspected IDUs is a controversial topic. One major issue that emerged from the focus groups was the weighing of the public health focus of preventing disease and the potential of increasing unfavorable clientele in the pharmacy. It is also a morally and ethically charged issue, with church/clergy emerging as an important referent group not supporting the provision of sterile syringes to known or suspected IDUs.

Belief-Based Measures

Ten belief-based measures were developed from three structured focus groups consisting of a total of 17 Texas community pharmacists. Table 5.2 presents a summary of the construction of the belief-based constructs of attitude, subjective norm and perceived behavioral control.

Table 5.2
Summary of Development of Belief-Based Measures of Attitude, Subjective Norm, and Perceived Behavioral Control

KEY QUESTIONS ASKED DURING FOCUS GROUPS	RESPONSES TO QUESTIONS	CONSTRUCTS IN FINAL SURVEY
Advantages and disadvantages of providing sterile syringes to known or suspected IDUs	▪ Decrease the spread of HIV and other blood-borne diseases. ▪ Increase the number of IDUs in pharmacy. ▪ Provide opportunities to counsel or offer treatment referrals. ▪ Encourage drug use. ▪ Decrease healthcare costs. ▪ Decrease stigma associated with IDUs. ▪ Increase syringe accessibility. ▪ Increase crime/theft. ▪ Require more time from pharmacist. ▪ Increase safety concerns for staff and clientele.	Behavioral beliefs
Individuals/groups who would approve and/or disapprove of pharmacists providing sterile syringes to known or suspected IDUs.	▪ Professional Organizations ▪ Health Organizations ▪ Regulatory Agencies ▪ Community Groups ▪ Family ▪ Friends ▪ IDUs ▪ Church/Clergy ▪ Employer/Management	Normative beliefs
Factors that would make it easy and/or difficult to provide sterile syringes to known or suspected IDUs.	▪ Work-related high demands of time. ▪ Support from regulatory agencies. ▪ Support from employer. ▪ Support from community. ▪ Support from staff/peers. ▪ Support from family. ▪ Personal ethical and moral issues.	Perceived Behavioral Control beliefs

Note: IDU = Intravenous Drug User.

Behavioral beliefs obtained from responses to the focus group questions regarding advantages and disadvantages of providing sterile syringes to known or suspected IDUs were used to calculate the belief-based attitude score. Normative beliefs obtained from the responses to the focus group questions regarding who would approve or disapprove of pharmacists providing sterile syringes were used to calculate the belief-based subjective norm score. Perceived behavioral control beliefs obtained from the focus group questions regarding what would make it easy or difficult to provide sterile syringes to IDUs were used to calculate the belief-based perceived behavioral control score.

Pilot Test

A pilot test of the survey was undertaken to determine if there were any major problems with the instrument such as wording of the questions and instructions and if any part of the survey was confusing to the respondents. Thirteen volunteers in Austin, Texas were selected to complete the pilot test. Reliability of the three belief-based scales used in the survey (i.e., attitude, subjective norm, and perceived behavioral control) were tested using Cronbach's alpha. Cronbach's alpha for attitude, subjective norm, and perceived behavioral control were 0.33, 0.67, and 0.14, respectively. One possible reason for the low reliability was the low number of participants in the pilot test. The scales were left unchanged for the study questionnaire. Appropriate changes were made to the instrument when necessary regarding survey format and wording.

Distribution of Surveys and Response Rates

Of the 500 surveys initially mailed out to Texas community pharmacists, a total of six surveys were returned as undeliverable. Four surveys were undeliverable due to unknown or incorrect addresses and two surveys were returned due to a change in address. The four unknown/incorrect addresses were omitted from the second mailing list and the two new addresses were changed for the second mailing. A follow-up survey and revised cover letter were then mailed on November 28, 2001 to 496 potential study participants from the modified mailing list. Data collection ended three weeks after the second mailing of the survey. After the second mailing, two surveys were returned as undeliverable, one due to a change in address and one due to a unknown or incorrect address. The second mail-out surveys that were undeliverable contained different names/address than the first mail-out surveys that were undeliverable. Therefore, it is possible that the two persons who did not receive the second mail-out surveys did receive the first mail-out surveys.

For response rate calculations, 496 surveys were used as the number of surveys distributed. Five returned surveys were excluded. Of the five surveys that were excluded, one pharmacist had retired, one pharmacist only completed demographic data, one pharmacist did not complete the survey because cost issues were not addressed, one pharmacist did not complete significant questions pertaining to beliefs and one survey was ripped where answers were unidentifiable. Of the 496 surveys distributed, a total of 174 usable surveys were returned, yielding a response rate of 35.1 percent.

Non-normality

Data were entered into an SPSS data file for screening. The first step in data screening involved an assessment of non-normality. With regard to the issue of non-normality in the analysis of multivariate data, Curran, West and Finch (1996) recommend concern if skewness is > |2| and kurtosis is > |7|. An examination of the skewness and kurtosis statistics for each variable failed to identify any distributions that met these threshold values except for the Belief Variable: Providing sterile syringes to known or suspected IDUs will increase the number of IDUs coming into my pharmacy (skewness = -2.19), Ethnicity Variable (skewness = -2.09) and an IDU Screening Variable "Requiring Picture ID" (skewness = 2.33). There was little concern regarding skewness since the skewness of the three variables was close to |2|.

Outliers

For regression analysis, one univariate outlier was identified in each of three respondents. The outliers were outside of three standard deviations of the predicted value. The cases involved in these three outliers were excluded from the regression analyses.

Missing Data

There were 322 instances of missing data across all respondents and variables. These cases of incomplete data were spread across 51 respondents (29.3%). Within each individual variable, the rate of missing data did not exceed 4.6 percent (range 0.6% to 4.6%). To discern if there were any patterns dictating the occurrence of missing data within the study sample, cases with incomplete and full data were subdivided into two groups and an independent groups t-test was performed across each study variable. Significant differences between the missing data sample and the full data sample were found with the "Outcome 1 Variable: Providing sterile syringes to known or suspected IDUs will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis) is Good/Bad" (t=-2.60, p=0.01), the "Outcome 5 Variable: Providing sterile syringes to known or suspected IDUs will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits) is Good/Bad" (t=-3.52, p=0.01), the "Motivation to Comply Variable: Employer/Management" (t=2.62, p=0.01) and the "Control Variable: Work-related high demands of my time" (t=-2.10, p=0.04). All other study variable p-values ranged from 0.983 to 0.051. For the most part, the results of the analysis supported the argument that missing data were missing at random, and there was not any distinguishable systematic pattern underlying the incidence of missing data (West, 2001; Rubin, 1976).

Multiple imputation was used to impute missing values. The resulting covariance matrix is provided in Table 5.3.

Table 5.3. Raw Study Data EQS Input Covariance Matrix

	Will	D Att	D SN	D PBC	PB	BB Att	BB SN	BB PBC
Will	4.99							
D Att	17.22	94.53						
D SN	2.77	12.19	3.40					
D PBC	4.01	17.09	2.43	10.46				
PB	2.69	10.50	1.47	3.34	4.25			
BB Att	38.33	188.40	25.12	43.41	24.99	910.10		
BB SN	7.90	36.05	7.33	6.83	2.03	99.77	486.90	
BB PBC	5.11	44.38	6.27	4.27	3.79	104.20	50.81	242.70

LEGEND
Will = Willingness
D Att = Direct Attitude
D SN = Direct Subjective Norm
D PBC = Direct Perceived Behavioral Control
PB = Recent Past Behavior
BB Att = Belief-Based Attitude
BB SN = Belief-Based Subjective Norm
BB PBC = Belief-Based Perceived Behavioral Control

Internal Consistency

Cronbach's alpha was used to confirm the internal consistency of the measurement scales of the survey instrument using the entire usable sample of responses. These reliability coefficients are displayed in Tables 5.4 and 5.5. Each belief-based measurement scale and the direct measure attitude scale demonstrated a composite reliability exceeding the 0.60 threshold value suggested by Bagozzi and Yi (1988), indicating good reliability, except the direct measure perceived behavioral control scale. The direct measure perceived behavioral control scale is the most unreliable scale measurement (α=0.58). One possible explanation is the low number of items (two items) used in the direct measure perceived behavioral control scale. The direct measure of subjective norm was only one item, and therefore, a Cronbach's alpha was not computed.

Table 5.4
Reliability Analysis of Belief-Based Study Scales

Scale	Number of Items	Standardized Item Alpha
Belief-Based Attitude	10	0.85
Belief-Based Subjective Norm	9	0.75
Belief-Based Perceived Behavioral Control	7	0.70

Table 5.5
Reliability Analysis of Direct Measure Study Scales

Scale	Number of Items	Standardized Item Alpha
Direct Measure Attitude	6	0.93
Direct Measure Perceived Behavioral Control	2	0.58

Demographics

Over half of the respondents were male (59.5%). The mean age of the respondents in the study was 48.6 years (SD=12.46) with a range of 26 to 78 years. Table 5.6 depicts the age, gender and ethnicity of the respondents.

Table 5.6
Descriptive Statistics on Age, Gender, and Ethnicity

Variable	N (%)	Mean	Standard Deviation	Minimum Value	Maximum Value
Age (Years)[a]		48.6	12.46	26	78
Gender[b]					
Male	103 (59.5)				
Female	70 (40.5)				
Ethnicity[c]					
Caucasian	137 (79.7)				
Mexican-American	16 (9.3)				
African-American	9 (5.2)				
Asian-American	7 (4.1)				
American Indian	1 (0.6)				
Other[d]	2 (1.2)				

[a]Three pharmacists failed to indicate age (N=171).
[b]One pharmacist failed to indicate gender (N=173).
[d]Two pharmacists failed to indicate ethnicity (N=172).
[d]Other includes one Caucasian-German and one blank "other" item.

The majority of the respondents were Caucasian (N=137) followed by Mexican-American (N=16), African-American (N=9) and Asian-American (N=7). Only one pharmacist identified himself/herself as American-Indian and two pharmacists indicated the "Other" category regarding ethnicity, with one pharmacist indicating Caucasian-German and the other leaving the "Other" item blank. Two respondents failed to indicate ethnicity.

Practice Characteristics

Table 5.7 depicts practice characteristics of respondents. Less than half of the respondents (44.4%) were staff pharmacists while 39.1 percent were pharmacy managers and pharmacy owners/partners. Eight pharmacists (4.7%) indicated the "Other" category, including assistant managers, clinical, compliance specialist, pharmacy director, and supervisor. Five pharmacists failed to indicate job title. Over half of the respondents (68.8%) worked in chain pharmacies and 78.9 percent of respondents worked in urban and suburban areas.

Table 5.7
Descriptive Statistics on Practice Characteristics

Practice Characteristics	N (%)
Job Title[a]	
Pharmacy Owner/Partner	18 (10.7)
Pharmacy Manager	48 (28.4)
Staff Pharmacist	75 (44.4)
Relief Pharmacist	20 (11.8)
Other[b]	8 (4.7)
Practice Setting[c]	
Community – Independent	47 (27.6)
Community – Chain	117 (68.8)
Community – Clinic	1 (0.6)
Other[d]	5 (2.9)
Practice Area[e]	
Urban	63 (37.1)
Suburban	71 (41.8)
Rural	36 (21.2)

[a]Five pharmacists failed to indicate job title (N=169).
[b]Other includes assistant manager, clinical, compliance specialist, pharmacy director, and supervisor.
[c]Four pharmacists failed to indicate practice setting (N=170).
[d]Other includes hospital outpatient, hospital retail, long term/assisted care hospital, and infusion center.
[e]Four pharmacists failed to indicate practice area (N=170).

Table 5.8 depicts respondents' years in practice, hours worked per week, and hours of dispensing per week. On average, respondents worked full time (mean=37.3, SD=11.56) and spent over 30 hours per week dispensing prescriptions (mean=33.1, SD=13.00).

Table 5.8
Descriptive Statistics on Years in Practice, Hours Work/Week, and Hours Dispense Rx/Wk[a]

	Mean	**Standard Deviation**	**Minimum Value**	**Maximum Value**
Years in Practice[b]	21.7	12.90	2	53
Hours Work/Week[c]	37.3	11.56	5	65
Hours Dispense Rx/Wk[d]	33.1	13.00	2	65

[a]Rx/Wk = prescriptions per week.
[b]Two pharmacists failed to indicate Years in Practice (N=172).
[c]Five pharmacists failed to indicate Hours Work/Week (N=169).
[d]Six pharmacists failed to indicate Hours Dispense Rx/Week (N=168).

Table 5.9 depicts respondents' screening procedures when selling syringes. Over half of the respondents' required diabetic information (54.7%) and/or considered familiarity with their customers (62.8%) when selling syringes. Only 18.0 percent (N=31) did not screen customers when selling syringes.

Table 5.9
Descriptive Statistics for Screening Procedures

Screening Procedures[a]	**N (%)**
Do not screen	31 (18.0)
Require Diabetic Information	94 (54.7)
Require Picture Identification	21 (12.2)
Require Name/Address	26 (15.1)
Consider Time of Day	40 (23.3)
Ask Why They Want Them	84 (48.8)
Consider Familiarity with Customer	108 (62.8)
Other[b]	36 (20.9)

[a]Two pharmacists failed to mark any response (N=172).
[b]Others include "Require prescription," "Question knowledge of syringes," "Physical characteristics," "Depends on requirements of management," and "Wears identification bracelet."

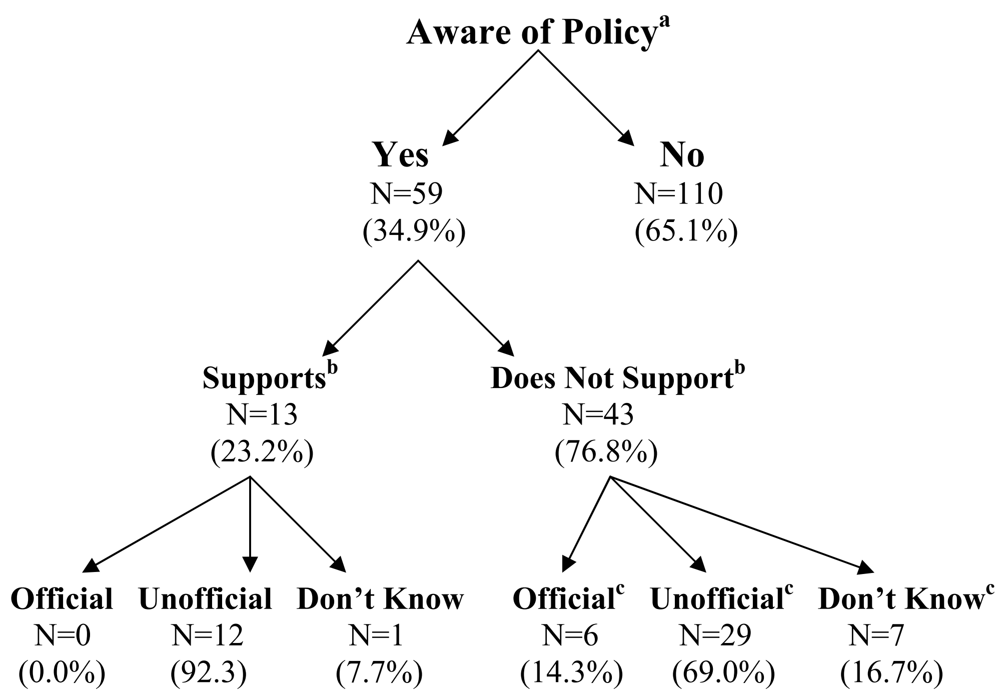
Determination of Known or Suspected IDU

Over three-fourth of the respondents (N=151) completed the open-ended question asking respondents to describe in their own words how they suspect or know an individual is an IDU. The six most frequent responses included appearance (75 responses), inaccurate responses to questions regarding the purpose of the syringe such as incorrect syringe size and incorrect insulin dosage (65 responses), behavior (35 responses), stories/excuses provided by the customer requesting syringes (27 responses), unfamiliarity of the customer (20 responses) and time of day the customer requests syringes (16 responses). Words to describe appearance included "unkept," "poor grooming," "thin," "track marks," "pale," "worn-looking," "long hair," "tattoos," "piercings," "dirty," "young," "body odor," "unhealthy," "strung-out" and "wasted/drawn." Words to describe behavior included "drunk," "spaced-out," "nervous" and "poor eye contact." Out of the 27 respondents stating that known or suspected IDUs make up stories/excuses, 22 respondents stated that known or suspected IDUs say that the syringes are for a grandmother/mother. Respondents indicated that known or suspected IDUs usually request syringes at night and on the weekends. Respondents also stated that known or suspected IDUs talk too much (12 responses), are arrogant and demanding (9 responses), will only buy syringes (1 response) and will pay any price (1 response). Four respondents stated that they have a gut feeling about a known or suspected IDU, whereas, 10 respondents stated they do not question or make judgments about any customer requesting syringes.

Policy Knowledge

Out of the 169 pharmacists who indicated an awareness of a policy, 65.1 percent (N=110) of respondents were not aware of an official or unofficial policy regarding the provision of sterile syringes to known or suspected IDUs at their pharmacy. Five pharmacists failed to answer this survey item (N=169). Of those pharmacists who were aware of a policy (N=59), 76.8 percent (N=43) stated their pharmacy policy does not support the provision of sterile syringes to known or suspected IDUs and three pharmacists failed to indicate whether or not the policy supported the provision of sterile syringes. Figure 5.1 presents the descriptive statistics on policy knowledge.

Figure 5.1
Descriptive Statistics on Policy Awareness, Policy Support, and Official Policy Status



[a]Five pharmacists failed to indicate Awareness of Policy (N=169).
[b]Three pharmacists failed to indicate Policy Support (N=56).
[c]One pharmacist failed to indicate Official Policy Status (N=42).

Constructs of the Theory of Planned Behavior

The survey measured all the constructs of the TPB. The constructs are willingness, attitude, subjective norms and perceived behavioral control. As discussed in Chapter 4, the "intention" construct in the TPB was changed to "willingness" for the purpose of this study. Attitude, subjective norms, and perceived behavioral control were measured using both direct and belief-based measures. In addition to the key constructs of the TPB, a measure of recent past behavior was examined.

Direct Measures

Direct measures of willingness, attitudes, subjective norms and perceived behavioral control toward the provision of sterile syringes to known or suspected IDUs were developed from the literature and recommendations from Ajzen's TPB. One item was used to measure willingness, a total of six items was used to measure direct attitude, one item was used to measure direct subjective norm and two items were used to measure direct perceived behavioral control.

Table 5.10 shows the mean and frequency distribution of willingness. The mean willingness score was –0.37 (SD=2.25, range –3 to +3). Out of the 170 pharmacists who responded to the question, 50.6 percent of the responses (N=86) were between –1 and –3, indicating respondents were not willing to provide sterile syringes to known or suspected IDUs. Over one-fourth of the respondents (28.2%) were very unwilling (-3) to provide sterile syringes. Four pharmacists failed to indicate their willingness to provide sterile syringes to IDUs.

Table 5.11 shows the mean and frequency distribution of direct attitudes. Direct attitude was measured with six questions using a 7-point semantic differential scale with the following anchors: bad/good, harmful/beneficial, useless/useful, foolish/wise, worthless/valuable, punishing/rewarding. The mean direct attitude score was –0.52 (SD=9.76, range –18 to +18), indicating respondents did not have a favorable attitude toward the provision of sterile syringes to known or suspected IDUs. Four of the six items were between –1 and 0, indicating unfavorable attitudes toward providing sterile syringes to known or suspected IDUs.

Table 5.10
Mean and Frequency Distribution of Willingness (1 item)

Question: I am willing to provide sterile syringes to known or suspected IDUS.

			Frequency Distribution of Responses (%)						
N	**Mean**	**SD**	**Very Unwilling (-3)**			**Neither Willing nor Unwilling (0)**			**Very Willing (+3)**
170	-0.37	2.25	28.2	14.7	7.6	8.2	11.2	16.5	13.5

Note: IDU = Intravenous Drug User.

Table 5.11
Mean and Frequency Distribution of Direct Attitude (6 items)

Item	Question	N	Mean	SD	Frequency Distribution of Responses (%)						
					Very Bad (-3)			**Neither Good nor Bad (0)**			**Very Good (+3)**
1	I feel that providing sterile syringes to known or suspected IDUs is….	170	-0.37	1.99	21.2	14.7	12.4	14.1	14.7	15.3	7.6
					Very Harmful (-3)			**Neither Beneficial nor Harmful (0)**			**Very Beneficial (+3)**
2	I feel that providing sterile syringes to known or suspected IDUs is….	169	0.17	1.98	14.8	11.8	8.3	13.6	23.7	13.6	14.2
					Very Useless (-3)			**Neither Useful nor Useless (0)**			**Very Useful (+3)**
3	I feel that providing sterile syringes to known or suspected IDUs is….	166	0.01	1.98	17.5	10.8	8.4	15.1	25.3	10.2	12.7

Table 5.11 (continued)
Mean and Frequency Distribution of Direct Attitude (6 items)

					Frequency Distribution of Responses (%)						
Item	**Question**	**N**	**Mean**	**SD**	**Very Foolish (-3)**			**Neither Wise nor Foolish (0)**			**Very Wise (+3)**
4	I feel that providing sterile syringes to known or suspected IDUs is….	167	-0.17	1.98	21.0	8.4	12.0	16.2	20.4	12.6	9.6
					Very Worthless (-3)			**Neither Valuable nor Worthless (0)**			**Very Valuable (+3)**
5	I feel that providing sterile syringes to known or suspected IDUs is….	165	-0.04	1.91	13.9	13.9	12.1	15.8	21.2	12.1	10.9
					Very Punishing (-3)			**Neither Rewarding nor Punishing (0)**			**Very Rewarding (+3)**
6	I feel that providing sterile syringes to known or suspected IDUs is….	166	-0.09	1.24	8.4	3.0	9.0	58.4	13.3	5.4	2.4
Scale Total		**165**	**-0.52**	**9.76**							

Note: IDU=Intravenous Drug User

One item was used to directly measure subjective norm. Subjective norm was measured using a 7-point bipolar scale (ranging from –3 "strongly disagree" to +3 "strongly agree"). The mean direct subjective norm was –0.44 (SD=1.84, range –3 to +3), meaning that pharmacists slightly disagreed with the statement, "If I provide sterile syringes to known or suspected IDUs, most people who are important to me would approve." Table 5.12 depicts the mean and frequency of distribution of the subjective norm responses.

Table 5.12
Mean and Frequency Distribution of Direct Subjective Norm (1 item)

Question: If I provide sterile syringes to known or suspected IDUs, most people who are important to me would approve.

			Frequency Distribution of Responses (%)						
N	**Mean**	**SD**	**Strongly Disagree (-3)**			**Neither Agree nor Disagree (0)**			**Strongly Agree (+3)**
170	-0.44	1.84	18.2	16.5	10.0	25.3	14.1	8.2	7.6

Note: IDU=Intravenous Drug User.

Two items were used to measure direct perceived behavioral control using a 7-point bipolar scale (ranging from –3 “strongly disagree” to +3 “strongly agree”). The overall direct perceived behavioral control mean score was 0.71 (SD=3.24, range –6 to +6) indicating that pharmacists feel fairly neutral about having complete control over whether or not they will provide sterile syringes and that the provision of sterile syringes is fairly easy to do. The mean response to the statement, “For me to provide sterile syringes to known or suspected IDUs would be easy,” was between –1 and 0 (mean= -0.52, SD=2.28, range –3 to +3), indicating a slight disagreement with the statement. The mean response to the statement, “I have complete control over whether or not I will provide sterile syringes to known or suspected IDUs,” was between +1 and +2 (mean=1.23, SD=2.03, range –3 to +3), indicating that respondents agreed with the statement. Table 5.13 shows the mean and frequency distribution of direct perceived behavioral control.

Table 5.13
Mean and Frequency Distribution of Direct Perceived Behavioral Control (2 items)

					Frequency Distribution of Responses (%)						
Item	**Question**	**N**	**Mean**	**SD**	**Strongly Disagree (-3)**			**Neither Agree nor Disagree (0)**			**Strongly Agree (+3)**
1	For me to provide sterile syringes to known or suspected IDUs would be easy.	172	-0.52	2.28	31.4	15.7	7.6	7.0	8.7	16.9	12.8
2	I have complete control over whether or not I will provide sterile syringes to known or suspected IDUs.	172	1.23	2.03	8.7	5.8	8.1	8.7	8.1	20.3	40.1
Scale Total		**172**	**0.71**	**3.24**							

Note: IDU=Intravenous Drug User.

Recent past behavior was measured using a 7-point bipolar scale ranging from –3 “Never” to 0 “Sometimes” to +3 “Always.” The mean for the recent past behavior item was –1.11 (SD=2.07, range –3 to +3), indicating that pharmacists had not often provided sterile syringes to known or suspected IDUs in the last three months. Out of the 172 respondents, 42.4 percent of respondents (N=73) indicated that they had never provided sterile syringes to known or suspected IDUs and 12.8 percent of respondents (N=22) reported that they sometimes provided sterile syringes to IDUs. Only 5.8 percent (N=10) reported that they always provide sterile syringes to known or suspected IDUs. Two pharmacists did not complete the item. Table 5.14 shows the mean and frequency distribution of the recent past behavior question.

Table 5.14
Mean and Frequency Distribution of Recent Past Behavior (1 item)

Question: How often did you provide sterile syringes to a known or suspected IDU in the last three months?

			Frequency Distribution of Responses (%)						
N	**Mean**	**SD**	**Never (-3)**			**Sometimes (0)**			**Always (+3)**
172	-1.11	2.07	42.4	14.0	4.7	12.8	9.3	11.0	5.8

Note: IDU=Intravenous Drug User.

Belief-Based Measures

Belief-based attitude, belief-based subjective norm, and belief-based perceived behavioral control were measured using 7-point bipolar scales. The belief-based attitude construct consisted of two components: the behavioral belief and its respective behavioral outcome. Twenty items were used to measure belief-based attitude, including ten behavioral beliefs and their respective behavioral outcomes. Each behavioral belief was measured using the scale response of -3 “Very Unlikely” to +3 “Very Likely” and each behavioral outcome was measured using the scale response of -3 “Very Bad” to +3 “Very Good.”

The belief-based subjective norm construct consisted of two components: normative beliefs and motivation to comply. Eighteen items were used to measure belief-based subjective norm, including nine normative beliefs and their respective motivation to comply components. Both components were measured using the scale response of –3 “Very Unlikely” to +3 “Very Likely.”

The belief-based perceived behavioral control construct consisted of two components: control beliefs and perceived power. Fourteen items were used to measure belief-based perceived behavioral control, including seven control beliefs and their respective perceived power components. Each control belief was measured using the scale response of -3 “Very Difficult” to +3 “Very Easy” and the evaluative component was measured using the scale response of –3 “No Control” to +3 “Complete Control.”

Belief-Based Attitude

Pharmacists responded to the likelihood that the ten outcomes (behavioral beliefs) mentioned in the survey would happen if they provided sterile syringes to known or suspected IDUs. Table 5.15 shows the means and frequency distributions of behavioral beliefs. Each behavioral belief was then summed (over ten items) to calculate the total mean score for behavioral beliefs. Pharmacists then evaluated how good or bad (outcome evaluations) it would be if those consequences happened if they provided sterile syringes to known or suspected IDUs. Table 5.16 shows the means and frequency distributions of behavioral outcomes. Each behavioral outcome was then summed (over ten items) to calculate the total mean score for behavioral outcomes. Each behavioral belief was multiplied by its respective behavioral outcome and then summed to get the belief-based attitude score. Table 5.17 shows the mean products of the behavioral belief and outcome evaluation scores and the belief-based attitude score.

Table 5.15
Mean and Frequency Distribution of Behavioral Beliefs (10 items)

Item	Behavioral Beliefs	N	Mean	SD	Frequency Distribution of Responses (%)						
					Very Unlikely (-3)			Neither Likely Nor Unlikely (0)			Very Likely (+3)
1	Providing sterile syringes to IDUs will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis).	171	0.45	2.04	13.5	8.8	10.5	11.1	17.5	19.9	18.7
2	Providing sterile syringes to IDUs will increase the number of IDUs into my pharmacy.	174	2.29	1.14	1.1	1.1	0.0	4.6	12.1	20.1	60.9
3	Providing sterile syringes to IDUs will provide opportunities to counsel and/or offer treatment referrals to IDUs.	174	-0.45	1.90	22.4	11.5	12.6	20.1	14.4	13.2	5.7
4	Providing sterile syringes to IDUs will encourage drug use.	173	0.64	1.86	9.8	6.4	4.6	24.9	20.8	11.0	22.5

Table 5.15 (continued)
Mean and Frequency Distribution of Behavioral Beliefs (10 items)

					Frequency Distribution of Responses (%)						
Item	Behavioral Beliefs	N	Mean	SD	Very Unlikely (-3)			Neither Likely Nor Unlikely (0)			Very Likely (+3)
5	Providing sterile syringes to IDUs will decrease healthcare costs (i.e., decreasing costs associated with HIV medication, hospital stays and clinic visits).	172	0.09	1.97	15.1	11.6	10.5	12.8	25.6	10.5	14.0
6	Providing sterile syringes to IDUs will decrease the stigma associated with IDUs.	172	-1.19	1.75	34.3	15.7	12.8	20.9	8.1	4.1	4.1
7	Providing sterile syringes to IDUs will increase the accessibility of sterile syringes to IDUs, make it more convenient to obtain sterile syringes.	172	2.01	1.25	1.7	0.0	1.7	8.7	14.5	26.2	47.1

Table 5.15 (continued)
Mean and Frequency Distribution of Behavioral Beliefs (10 items)

Item	Behavioral Beliefs	N	Mean	SD	Frequency Distribution of Responses (%)						
					Very Unlikely (-3)			Neither Likely Nor Unlikely (0)			Very Likely (+3)
8	Providing sterile syringes to IDUs will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community.	173	1.25	1.42	2.3	1.2	3.5	24.3	26.6	15.6	26.6
9	Providing sterile syringes to IDUs will require more time from me, limiting time for other clientele.	173	0.91	1.58	4.0	3.5	8.1	22.5	26.6	13.9	21.4
10	Providing sterile syringes to IDUs will increase safety concerns for my staff and customers/clientele.	173	1.31	1.55	2.3	5.2	2.9	15.6	27.2	16.8	30.1
	Scale Total	**164**	**7.40**	**6.23**							

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.

Table 5.16
Mean and Frequency Distribution of Behavioral Outcomes (10 items)

					Frequency Distribution of Responses (%)						
Item	**Behavioral Beliefs**	**N**	**Mean**	**SD**	**Very Bad (-3)**			**Neither Good Nor Bad (0)**			**Very Good (+3)**
1	Decreasing the spread of HIV and other blood-borne pathogens (e.g., hepatitis) will be…	171	1.81	1.39	1.2	1.8	2.9	13.5	14.6	21.6	44.4
2	Increasing the number of IDUs into my pharmacy will be…	169	-1.08	1.93	34.3	16.6	17.2	6.5	10.1	10.7	4.7
3	Providing opportunities to counsel and/or offer treatment referrals to IDUs will be…	171	0.64	1.62	5.8	7.6	4.1	24.6	28.7	15.8	13.5
4	Encouraging drug use will be…	171	-1.14	1.77	35.7	10.5	15.2	22.8	5.8	6.4	3.5
5	Decreasing healthcare costs (i.e., decreasing costs associated with HIV medication, hospital stays and clinic visits) will be…	169	1.34	1.65	3.6	4.7	4.1	14.8	20.1	20.1	32.5

Table 5.16 (continued)
Mean and Frequency Distribution of Behavioral Outcomes (10 items)

Item	Behavioral Beliefs	N	Mean	SD	Frequency Distribution of Responses (%)						
					Very Bad (-3)			Neither Good Nor Bad (0)			Very Good (+3)
6	Decreasing the stigma associated with IDUs will be…	169	-0.50	1.58	16.0	12.4	10.1	41.4	11.8	3.6	4.7
7	Increasing the accessibility of sterile syringes to IDUs, making it more convenient to obtain sterile syringes, will be…	168	0.51	1.98	13.1	7.1	7.1	16.7	20.2	16.1	19.6
8	Increasing shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community will be…	170	-1.45	1.79	45.3	13.5	9.4	16.5	7.6	3.5	4.1
9	Requiring more time from me, limiting time for other clientele, will be…	170	-0.99	1.59	22.9	17.6	20.6	22.9	10.0	2.4	3.5

Table 5.16 (continued)
Mean and Frequency Distribution of Behavioral Outcomes (10 items)

					Frequency Distribution of Responses (%)						
Item	Behavioral Beliefs	N	Mean	SD	Very Bad (-3)			Neither Good Nor Bad (0)			Very Good (+3)
10	Increasing safety concerns for my staff and customers/clientele will be…	169	-1.36	1.76	37.3	17.8	17.8	10.7	8.9	2.4	5.3
	Scale Total	**163**	**-2.00**	**9.81**							

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.

Table 5.17
Mean and Standard Deviation of Product of Behavioral Belief and Outcome Evaluation Scores

Item	Behavioral Belief and Outcome Evaluation	N	Mean	SD
1	Providing sterile syringes to IDUs will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis). Decreasing the spread of HIV and other blood-borne pathogens (e.g., hepatitis) will be…	168	2.05	4.80
2	Providing sterile syringes to IDUs will increase the number of IDUs into my pharmacy. Increasing the number of IDUs into my pharmacy will be…	169	-2.84	5.47
3	Providing sterile syringes to IDUs will provide opportunities to counsel and/or offer treatment referrals to IDUs. Providing opportunities to counsel and/or offer treatment referrals to IDUs will be…	171	0.99	3.71
4	Providing sterile syringes to IDUs will encourage drug use. Encouraging drug use will be…	171	-0.74	4.82
5	Providing sterile syringes to IDUs will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits. Decreasing healthcare costs (i.e., decreasing costs associated with HIV medication, hospital stays and clinic visits) will be…	168	1.54	4.46
6	Providing sterile syringes to IDUs will decrease the stigma associated with IDUs. Decreasing the stigma associated with IDUs will be…	169	1.82	3.78

Table 5.17 (continued)
Mean and Standard Deviation of Product of Behavioral Belief and Outcome Evaluation Scores

Item	Behavioral Belief and Outcome Evaluation	N	Mean	SD
7	Providing sterile syringes to IDUs will increase the accessibility of sterile syringes to IDUs, make it more convenient to obtain sterile syringes. Increasing the accessibility of sterile syringes to IDUs, making it more convenient to obtain sterile syringes, will be…	168	1.45	5.29
8	Providing sterile syringes to IDUs will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community. Increasing shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community will be…	170	-2.31	4.58
9	Providing sterile syringes to IDUs will require more time from me, limiting time for other clientele. Requiring more time from me, limiting time for other clientele, will be…	170	-1.25	4.12
10	Providing sterile syringes to IDUs will increase safety concerns for my staff and customers/clientele. Increasing safety concerns for my staff and customers/clientele will be…	169	-2.18	4.90
Belief-Based Attitude*		**159**	**-0.92**	**29.99**

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.
*Possible Range = -90 to +90.

The mean product of behavioral belief scores and outcome evaluation scores for the beliefs that providing sterile syringes to known or suspected IDUs would increase the number of IDUs in the pharmacy (mean=-2.84, SD=5.47), would increase shoplifting and other drug-related thefts and crime in the pharmacy and surrounding community (mean= -2.31, SD=4.58) and would increase safety concerns for the pharmacy staff and customers/clientele (mean=-2.18, SD=4.90) were between -2 and -3. Mean responses were positive regarding beliefs and negative regarding outcomes, resulting in negative mean products of beliefs and outcomes. Only one mean product of belief and outcome scores was between the +2 and +3, the belief that providing sterile syringes to known or suspected IDUs would decrease the spread of HIV and other blood-borne pathogens (mean product=2.05, SD=4.80). The belief and outcome were on the positive side with a belief mean of 0.45 (SD=2.04) and an outcome mean of 1.81 (SD=1.39). The sum of the products of the mean behavioral beliefs and the mean outcome evaluations of those beliefs were used to get the mean belief-based attitude score. The possible range for the belief-based attitude score was –90 to +90. The mean belief-based attitude score was -0.92 (SD=29.99, range=-57 to 90), indicating a slightly unfavorable attitude toward providing sterile syringes to known or suspected IDUs.

Belief-Based Subjective Norm

Pharmacists evaluated how they felt toward nine individuals/groups by responding to the likelihood that each individual/group would want them to provide sterile syringes to known or suspected IDUs. Table 5.18 shows the means and frequency distributions of normative beliefs. Each normative belief was then summed (over nine items) to calculate the total mean score for normative beliefs. Pharmacists then responded to the likelihood that they would do what the each individual/group would want them to do (motivation to comply). Table 5.19 depicts the means and frequency distributions of the motivation to comply component. Each motivation to comply score was then summed (over nine items) to calculate the total mean score for motivation to comply. Each normative belief was multiplied by its respective motivation to comply component and then summed to get the belief-based subjective norm score. Table 5.20 shows the mean products of the normative belief and motivation to comply scores and the belief-based subjective norm score.

Table 5.18
Mean and Frequency Distribution of Normative Beliefs (9 items)

					Frequency Distribution of Responses (%)						
Item	**Normative Beliefs**	**N**	**Mean**	**SD**	**Very Unlikely (-3)**			**Neither Likely Nor Unlikely (0)**			**Very Likely (+3)**
1	Professional organizations (APhA, TPA) will think that I should provide sterile syringes to known or suspected IDUs.	171	0.18	1.77	11.7	10.5	7.0	22.8	23.4	16.4	8.2
2	Health organizations (CDC, HIV/AIDS advocacy groups) will think that I should provide sterile syringes to known or suspected IDUs.	170	1.87	1.69	7.1	1.8	0.0	5.3	9.4	27.1	49.4
3	Regulatory agencies/legal groups (TSBP, police) will think that I should provide sterile syringes to known or suspected IDUs.	170	-0.39	1.89	20.0	12.9	12.4	21.2	14.7	12.4	6.5

Table 5.18 (continued)
Mean and Frequency Distribution of Normative Beliefs (9 items)

Item	Normative Beliefs	N	Mean	SD	Frequency Distribution of Responses (%) Very Unlikely (-3)			Neither Likely Nor Unlikely (0)			Very Likely (+3)
4	Community groups will think that I should provide sterile syringes to known or suspected IDUs.	171	-0.38	1.74	17.0	13.5	11.7	25.1	18.1	10.5	4.1
5	My family will think that I should provide sterile syringes to known or suspected IDUs.	168	-0.84	1.82	29.2	11.3	11.9	26.2	8.9	8.3	4.2
6	My friends will think that I should provide sterile syringes to known or suspected IDUs.	171	-0.68	1.71	23.4	11.1	12.3	31.6	9.4	9.9	2.3
7	IDUs will think that I should provide sterile syringes to known or suspected IDUs.	170	1.83	1.84	7.6	1.8	1.2	10.6	7.1	11.8	60.0

Table 5.18 (continued)
Mean and Frequency Distribution of Normative Beliefs (9 items)

					Frequency Distribution of Responses (%)						
Item	**Normative Beliefs**	**N**	**Mean**	**SD**	**Very Unlikely (-3)**			**Neither Likely Nor Unlikely (0)**			**Very Likely (+3)**
8	My church/clergy will think that I should provide sterile syringes to known or suspected IDUs.	169	-0.51	1.92	25.4	10.7	8.3	22.5	17.8	8.9	6.5
9	My employer/management will think that I should provide sterile syringes to known or suspected IDUs.	171	-0.60	1.81	21.6	15.2	7.6	32.7	10.5	4.7	7.6
	Scale Total	**165**	**0.29**	**10.45**							

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User, APhA=American Pharmacy Association, CDC=Center for Disease Control, TPA=Texas Pharmacy Association, TSBP=Texas State Board of Pharmacy.

Table 5.19
Mean and Frequency Distribution of Motivation to Comply (9 items)

					Frequency Distribution of Responses (%)						
Item	**Motivation to Comply**	**N**	**Mean**	**SD**	**Very Unlikely (-3)**			**Neither Likely Nor Unlikely (0)**			**Very Likely (+3)**
1	Generally speaking, I will do what professional organizations (APhA, TPA) want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	0.52	1.75	9.5	6.5	4.7	26.6	20.7	18.3	13.6
2	Generally speaking, I will do what health organizations (CDC, HIV/AIDS advocacy groups) want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	0.43	1.83	13.0	5.3	4.7	22.5	24.9	16.6	13.0

Table 5.19 (continued)
Mean and Frequency Distribution of Motivation to Comply (9 items)

					Frequency Distribution of Responses (%)						
Item	**Motivation to Comply**	**N**	**Mean**	**SD**	**Very Unlikely (-3)**			**Neither Likely Nor Unlikely (0)**			**Very Likely (+3)**
3	Generally speaking, I will do what regulatory agencies/legal groups (TSBP, police) want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	1.27	1.84	7.1	4.7	2.4	14.8	17.8	17.2	36.1
4	Generally speaking, I will do what community groups want me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	-0.13	1.55	13.1	7.1	8.3	38.1	19.6	11.3	2.4
5	Generally speaking, I will do what my family wants me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	-0.11	1.61	13.1	8.3	7.1	38.7	16.7	12.5	3.6

Table 5.19 (continued)
Mean and Frequency Distribution of Motivation to Comply (9 items)

Item	Motivation to Comply	N	Mean	SD	Frequency Distribution of Responses (%): Very Unlikely (-3)			Neither Likely Nor Unlikely (0)			Very Likely (+3)
6	Generally speaking, I will do what my friends want me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	-0.21	1.56	13.7	9.5	6.5	38.7	20.2	8.9	2.4
7	Generally speaking, I will do what IDUs want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	-1.24	1.75	42.6	5.9	5.9	33.1	5.3	4.7	2.4
8	Generally speaking, I will do what my church/clergy wants me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.10	1.70	13.7	4.8	6.5	36.3	17.9	13.1	7.7

Table 5.19 (continued)
Mean and Frequency Distribution of Motivation to Comply (9 items)

					Frequency Distribution of Responses (%)						
Item	**Motivation to Comply**	**N**	**Mean**	**SD**	**Very Unlikely (-3)**			**Neither Likely Nor Unlikely (0)**			**Very Likely (+3)**
9	Generally speaking, I will do what my employer/management wants me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.75	1.96	12.5	6.0	2.4	16.7	20.8	19.0	22.6
	Scale Total	**165**	**1.26**	**11.46**							

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.

Table 5.20
Mean and Standard Deviation of Product of Normative Belief and Motivation to Comply Scores

Item	Normative Belief and Motivation to Comply	N	Mean	SD
1	Professional organizations (APhA, TPA) will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what professional organizations (APhA, TPA) want me to do regarding the provision of sterile syringes to known or suspected IDUs.	170	0.99	3.51
2	Health organizations (CDC, HIV/AIDS advocacy groups) will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what health organizations (CDC, HIV/AIDS advocacy groups) want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	1.47	4.85
3	Regulatory agencies/legal groups (TSBP, police) will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what regulatory agencies/legal groups (TSBP, police) want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	0.32	4.68
4	Community groups will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what community groups want me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.83	3.25

Table 5.20 (continued)
Mean and Standard Deviation of Product of Normative Belief and Motivation to Comply Scores

Item	Normative Belief and Motivation to Comply	N	Mean	SD
5	My family will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what my family wants me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.73	3.72
6	My friends will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what my friends want me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.88	3.36
7	IDUs will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what IDUs want me to do regarding the provision of sterile syringes to known or suspected IDUs.	169	-2.16	5.49
8	My church/clergy will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what my church/clergy wants me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.65	4.03
9	My employer/management will think that I should provide sterile syringes to known or suspected IDUs. Generally speaking, I will do what my employer/management wants me to do regarding the provision of sterile syringes to known or suspected IDUs.	168	0.71	4.54
Belief-Based Subjective Norm*		**162**	**4.31**	**22.13**

Note: Total sample size is 174. Note: IDU=Intravenous Drug User, APhA=American Pharmaceutical Association, CDC=Center for Disease Control, TPA=Texas Pharmacy Association.
*Possible Range = -81 to +81.

All mean products of normative beliefs and motivation to comply were positive except for the mean product regarding IDUs (mean product=-2.16, SD=5.49). Respondents indicated that IDUs were likely to want them to provide sterile syringes (mean=1.83, SD=1.84), however, respondents were not likely to do what IDUs would want them to do regarding the provision of sterile syringes to known or suspected IDUs (mean=-1.24, SD=1.75). The sum of the products of the mean normative belief scores and the mean motivation to comply scores were summed to get the belief-based subjective norm score. The possible range was between –81 and +81. The belief-based subjective norm score was 4.31 (SD=22.13, range –56 to +81), indicating that Texas community pharmacists were somewhat influenced by social norms to provide or not to provide sterile syringes to IDUs.

Belief-Based Perceived Behavioral Control

Pharmacists evaluated seven factors that would make it easy or difficult to provide sterile syringes to known or suspected IDUs. Table 5.21 shows the means and frequency of distributions for the seven control beliefs. Each control belief was then summed (over seven items) to calculate the total mean score for control beliefs. Pharmacists also evaluated how much control they would have to provide sterile syringes to known or suspected IDUs (perceived power). Table 5.22 depicts the means and frequency distributions for the seven perceived power items. Each perceived power item was then summed (over seven items) to calculate the total mean score for perceived power. Each control belief was then multiplied by its perceived power component and then summed to get the belief-based perceived behavioral control score. Table 5.23 shows the mean products of the control belief and perceived power scores and the belief-based perceived behavioral control.

Table 5.21
Mean and Frequency Distribution of Control Beliefs (7 items)

					Frequency Distribution of Responses (%)						
Item	**Control Beliefs**	**N**	**Mean**	**SD**	**Very Difficult (-3)**			**Neither Easy Nor Difficult (0)**			**Very Easy (+3)**
1	Work-related high demands of my time will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	169	-1.21	1.34	24.3	18.3	21.9	26.6	7.7	1.2	0.0
2	Support from regulatory agencies/change in Texas drug paraphernalia law will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	167	0.63	1.70	8.4	4.8	5.4	25.1	25.1	15.6	15.6
3	Support from employer/store policy will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	168	0.54	1.70	10.7	2.4	4.2	31.0	20.8	18.5	12.5
4	Support from community will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	167	0.30	1.52	8.4	5.4	4.2	37.1	27.5	9.6	7.8

Table 5.21 (continued)
Mean and Frequency Distribution of Control Beliefs (7 items)

					Frequency Distribution of Responses (%)						
Item	**Control Beliefs**	**N**	**Mean**	**SD**	**Very Difficult (-3)**			**Neither Easy Nor Difficult (0)**			**Very Easy (+3)**
5	Support from staff/peers will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	168	0.43	1.56	8.3	4.2	4.2	35.1	24.4	14.9	8.9
6	Support from family will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	168	0.18	1.41	8.9	3.0	3.6	50.6	19.0	9.5	5.4
7	Personal ethical and moral issues will make it difficult/easy to provide sterile syringes to known or suspected IDUs.	168	-0.26	2.13	25.0	8.9	10.7	17.9	11.9	11.3	14.3
Scale Total		**165**	**0.55**	**8.82**							

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.

Table 5.22
Mean and Frequency Distribution of Perceived Power (7 items)

					Frequency Distribution of Responses (%)						
Item	**Perceived Power**	**N**	**Mean**	**SD**	**No Control (-3)**			**Neither Complete Control Nor No Control (0)**			**Complete Control (+3)**
1	I have no control/complete control over work-related high demands of my time.	170	-0.12	1.92	14.1	12.9	17.6	18.2	12.9	11.8	12.4
2	I have no control/complete control over support from regulatory agencies/change in Texas drug paraphernalia law.	170	-0.85	1.68	25.3	15.3	9.4	29.4	13.5	4.1	2.9
3	I have no control/complete control over support from employer/store policy.	170	0.09	1.82	12.4	11.2	7.6	28.2	15.9	14.1	10.6
4	I have no control/complete control over support from community.	169	-0.34	1.45	11.2	12.4	9.5	43.8	14.8	5.9	2.4
5	I have no control/complete control over support from staff/peers.	168	0.55	1.50	3.6	7.7	7.1	31.5	22.0	17.9	10.1

Table 5.22 (continued)
Mean and Frequency Distribution of Perceived Power (7 items)

Item	Perceived Power	N	Mean	SD	Frequency Distribution of Responses (%) No Control (-3)			Neither Complete Control Nor No Control (0)			Complete Control (+3)
6	I have no control/complete control over support from family.	169	0.58	1.47	4.7	3.6	3.0	46.7	15.4	13.0	13.6
7	I have no control/complete control over personal ethical and moral issues.	170	1.62	1.55	2.9	2.9	1.2	17.1	13.5	22.9	39.4
Scale Total		**168**	**1.47**	**7.44**							

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.

Table 5.23
Mean and Standard Deviation of Product of Control Belief and Perceived Power Scores

Item	Control Belief and Perceived Power	N	Mean	SD
1	Work-related high demands of my time will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over work-related high demands of my time.	169	1.09	3.75
2	Support from regulatory agencies/change in Texas drug paraphernalia law will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over support from regulatory agencies/change in Texas drug paraphernalia law.	167	-0.33	3.94
3	Support from employer/store policy will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over support from employer/store policy.	168	0.11	3.63
4	Support from community will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over support from community.	166	-0.09	2.93
5	Support from staff/peers will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over support from staff/peers.	167	0.54	2.98

Table 5.23 (continued)
Mean and Standard Deviation of Product of Control Belief and Perceived Power Scores

Item	Control Belief and Perceived Power	N	Mean	SD
6	Support from family will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over support from family.	168	0.26	2.92
7	Personal ethical and moral issues will make it difficult/easy to provide sterile syringes to known or suspected IDUs. I have no control/complete control over personal ethical and moral issues.	168	-0.19	5.45
Belief-Based Perceived Behavioral Control*		**163**	**1.48**	**15.62**

Note: Total sample size is 174.
Note: IDU=Intravenous Drug User.
*Possible Range = -63 to +63.

The mean scores for two control beliefs 1) work-related high demands of time (mean=-1.21, SD=1.34) and 2) personal ethical and moral issues (mean=-0.26, SD=2.13) were negative, indicating that the two beliefs would make it more difficult for pharmacists to provide sterile syringes to known or suspected IDUs. The mean scores for perceived power of those beliefs were -0.12 (SD=1.92) and 1.62 (SD=1.55), respectively. All mean products of control beliefs and perceived power scores were between –1 and +1 except for the control belief "work-related high demands of my time would make it difficult/easy to provide sterile syringes to known or suspected IDUs" (mean=1.09, SD=3.76). The sum of the products of the mean control beliefs and the perceived power of those beliefs were used to get the belief-based perceived behavioral control score. The possible range for the score was between –63 and +63. The belief-based perceived behavioral control score was 1.48 (SD=15.61, range –51 to +63), indicating that pharmacists felt that they had some control over providing sterile syringes to known or suspected IDUs.

Tests of Hypotheses

> **H1:** Attitude, subjective norm and perceived behavioral control will explain a significant amount of variance in the willingness to provide sterile syringes to known or suspected IDUs.

For **H1**, multiple regression was used to regress willingness on the belief-based constructs of TPB (attitude, subjective norm, perceived behavioral control) to determine the best predictors of willingness to provide sterile syringes to known or suspected IDUs as depicted in Table 5.24. The direct measured constructs of TPB are depicted in Table 5.25. The R^2 value (coefficient of multiple determination) from the regression analysis was examined to determine the overall significance of the TPB in predicting willingness to provide sterile syringes to known or suspected IDUs.

Table 5.24
Multiple Regression Analysis for Belief-Based Constructs

Belief-Based Constructs	R	R^2	Adjusted R^2	Standardized Beta Coefficients	P Values
	0.609	0.371	0.356		
Attitude				0.539	0.001
Subjective Norm				0.138	0.053
Perceived Behavioral Control				0.105	0.138

Note: Total sample size is 136.
Note: Dependent Variable = Willingness.
Note: Overall significance of model F=26.099, d.f. = 3, 133, p<0.001.

As shown in Table 5.24, the belief-based constructs of attitude, subjective norm, and perceived behavioral control accounted for 37.1 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected intravenous drug users. Only the belief-based attitude construct was a significant predictor variable in the model. Overall, the model was statistically significant (F=26.099, d.f.=3, 133, p<0.001). Therefore, **H1** was supported.

Table 5.25
Multiple Regression Analysis for Direct Measure Constructs

Direct Measure Constructs	R	R^2	Adjusted R^2	Standardized Beta Coefficients	P Values
	0.857	0.735	0.730		
Attitude				0.658	0.001
Subjective Norm				0.200	0.001
Perceived Behavioral Control				0.076	0.133

Note: Total sample size is 157.
Note: Dependent Variable = Willingness.
Note: Overall significance of model F=142.531, d.f. = 3, 154, p<0.001.

As shown in Table 5.25, the direct measure constructs of attitude, subjective norm, and perceived behavioral control accounted for 73.5 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected intravenous drug users. Direct measure attitude and subjective norm were significant predictor variables in the model depicted in Table 5.25. Overall, the model was statistically significant (F=142.531, d.f.=3, 154, p<0.001). Therefore, **H1** was supported.

H2: Favorable attitudes will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

H3: Social norms supporting the provision of sterile syringes to known or suspected IDUs will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

H4: Strong perceptions of behavioral control will be a positive and significant predictor of willingness to provide sterile syringes to known or suspected IDUs.

For **H2**, **H3**, and **H4**, beta weights for attitudes, subjective norms and perceived behavioral control were examined to determine each constructs' (attitude, subjective norm, perceived behavioral control) positive/negative relationship and significance in predicting willingness to provide sterile syringes to known or suspected IDUs.

Tables 5.24 and 5.25 indicate that positive belief-based and direct measure attitudes were significant predictors of willingness, and therefore, **H2** is supported. Even though subjective norm and perceived behavioral control constructs were positive predictors of willingness to provide sterile syringes to known or suspected IDUs, the two belief-based constructs were not statistically significant. Therefore, **H3** and **H4** were not supported using the belief-based TPB constructs. **H3** was supported using the direct measure TPB constructs, whereas, **H4** was not supported using the direct measure TPB constructs.

Since favorable attitudes were a significant positive predictor of willingness to provide sterile syringes to known or suspected IDUs, Tables 5.26, 5.27 and 5.28 indicate which salient beliefs, respective outcome evaluations and which products (salient belief X outcome) were significantly different for those who are willing and those who are not willing. Willing respondents scored +1 to +3 on the 7-point willingness scale ranging from unwilling(-3) to willing(+3). Unwilling respondents scored –3 to –1 on the 7-point willingness scale. Neutral responders (score of 0) were not included in the t-test analyses (N=14).

Table 5.26
Beliefs about Providing Sterile Syringes to Known or Suspected Intravenous Drug Users by Willing/Unwilling to Provide Sterile Syringes

Beliefs* (N)	Means for Willing (SD) (n)	Means for Unwilling (SD) (n)	t-Test (P Value)
Will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis). (N=151)	1.90 (1.22) (n=70)	-0.91 (1.70) (n=81)	-11.78 (p<0.001)
Will increase the number of IDUs coming into my pharmacy. (N=153)	1.87 (1.26) (n=70)	2.59 (1.00) (n=83)	3.85 (p<0.001)
Will provide opportunities to counsel and/or offer treatment referrals to IDUs. (N=153)	0.56 (1.70) (n=70)	-1.39 (1.54) (n=83)	-7.36 (p<0.001)
Will encourage drug use. (N=152)	-0.72 (1.59) (n=69)	1.59 (1.42) (n=83)	9.37 (p<0.001)
Will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits. (N=151)	1.46 (1.45) (n=69)	-1.20 (1.53) (n=82)	-10.92 (p<0.001)
Will decrease the stigma associated with IDUs. (N=151)	-0.88 (1.66) (n=69)	-1.66 (1.63) (n=82)	-2.87 (p=0.005)
Will increase the accessibility sterile syringes to IDUs, making it more convenient to obtain sterile syringes. (N=151)	2.24 (0.92) (n=70)	1.77 (1.44) (n=81)	-2.45 (p=0.015)
Will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community. (N=152)	0.46 (1.16) (n=70)	1.84 (1.26) (n=82)	7.03 (p<0.001)

Table 5.26 (continued)
Beliefs about Providing Sterile Syringes to Known or Suspected Intravenous Drug Users by Willing/Unwilling to Provide Sterile Syringes

Beliefs* (N)	Means for Willing (SD) (n)	Means for Unwilling (SD) (n)	t-Test (P Value)
Will require more time from me, limiting time for other clientele. (N=152)	0.09 (1.45) (n=70)	1.45 (1.47) (n=82)	5.74 ($p<0.001$)
Will increase safety concerns for my staff and customers/clientele. (152)	0.36 (1.32) (n=70)	2.01 (1.31) (n=82)	7.73 ($p<0.001$)

Note: Total N=153 (n=70 for willing and n=83 for unwilling). Those respondents who were neutral were not grouped into either the willing or unwilling groups (n=14).
Note: IDU=Intravenous Drug User.
Note: Equal Variances not assumed for all independent t-tests.
*-3=Very Unlikely; 0=Neither Likely Nor Unlikely; 3=Very Likely; Possible mean range –3 to +3.

All of the differences in mean scores between the two groups were statistically significant.

Table 5.27
Outcomes about Providing Sterile Syringes to Known or Suspected Intravenous Drug Users by Willing/Unwilling to Provide Sterile Syringes

Outcomes/Evaluations* (N)	Means for Willing (SD) (n)	Means for Unwilling (SD) (n)	t-Test (P Value)
Will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis). (N=150)	2.30 (0.86) (n=70)	1.36 (1.59) (n=80)	4.58 (p<0.001)
Will increase the number of IDUs coming into my pharmacy. (N=148)	-0.46 (1.62) (n=70)	-1.79 (1.90) (n=78)	-4.63 (p<0.001)
Will provide opportunities to counsel and/or offer treatment referrals to IDUs. (N=150)	1.14 (1.29) (n=70)	0.19 (1.71) (n=80)	-3.90 (p<0.001)
Will encourage drug use. (N=150)	-0.87 (1.51) (n=70)	-1.49 (1.76) (n=80)	-2.31 (p=0.022)
Will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits. (N=148)	1.83 (1.31) (n=69)	0.73 (1.77) (n=79)	-4.31 (p<0.001)
Will decrease the stigma associated with IDUs. (N=148)	-0.13 (1.40) (n=68)	-0.98 (1.51) (n=80)	-3.52 (p<0.001)
Will increase the accessibility sterile syringes to IDUs, making it more convenient to obtain sterile syringes. (N=148)	1.67 (1.20) (n=69)	-0.58 (1.96) (n=79)	-8.54 (p<0.001)
Will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community. (N=149)	-0.91 (1.64) (n=69)	-2.01 (1.64) (n=80)	-4.07 (p<0.001)
Will require more time from me, limiting time for other clientele. (N=149)	-0.64 (1.33) (n=69)	-1.33 (1.65) (n=80)	-2.81 (p=0.006)
Will increase safety concerns for my staff and customers/clientele. (148)	-0.87 (1.44) (n=69)	-1.87 (1.76) (n=79)	-3.81 (p<0.001)

Note: Total N=153 (n=70 for willing and n=83 for unwilling). Those respondents who were neutral were not grouped into either the willing or unwilling groups (n=14).
Note: IDU=Intravenous Drug User. Note: Equal Variances not assumed for all independent t-tests.
*-3=Very Bad; 0=Neither Good Nor Bad; 3=Very Good; Possible mean range –3 to +3.

All of the differences in mean scores between the two groups were statistically significant.

Table 5.28
Products of (Beliefs x Outcomes) about Providing Sterile Syringes to Known or Suspected Intravenous Drug Users by Willing/Unwilling to Provide Sterile Syringes

Beliefs x Outcomes* (N)	Means for Willing (SD) (n)	Means for Unwilling (SD) (n)	t-Test (P Value)
Will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis). (N=148)	4.83 (3.68) (n=70)	-0.76 (4.13) (n=78)	-8.69 ($p<0.001$)
Will increase the number of IDUs coming into my pharmacy. (N=148)	-0.94 (4.08) (n=70)	-4.90 (5.66) (n=78)	-4.91 ($p<0.001$)
Will provide opportunities to counsel and/or offer treatment referrals to IDUs. (N=150)	1.43 (3.60) (n=70)	0.19 (3.68) (n=80)	-2.09 ($p=0.038$)
Will encourage drug use. (N=150)	1.45 (3.26) (n=69)	-2.77 (4.82) (n=81)	-6.34 ($p<0.001$)
Will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits. (N=147)	3.78 (3.56) (n=68)	-0.57 (4.23) (n=79)	-6.70 ($p<0.001$)
Will decrease the stigma associated with IDUs. (N=148)	1.25 (2.76) (n=68)	2.14 (4.50) (n=80)	1.47 ($p=0.144$)
Will increase the accessibility sterile syringes to IDUs, making it more convenient to obtain sterile syringes. (N=148)	4.36 (3.74) (n=69)	-1.25 (5.01) (n=79)	-7.78 ($p<0.001$)
Will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community. (N=149)	-0.61 (2.89) (n=69)	-3.99 (4.93) (n=80)	-5.21 ($p<0.001$)
Will require more time from me, limiting time for other clientele. (N=149)	0.25 (2.61) (n=69)	-2.46 (4.53) (n=80)	-4.56 ($p<0.001$)
Will increase safety concerns for my staff and customers/clientele. (148)	-0.23 (3.02) (n=69)	-4.06 (5.29) (n=79)	-5.49 ($p<0.001$)

Note: Total N=153 (n=70 for willing and n=83 for unwilling). Those respondents who were neutral were not grouped into either the willing or unwilling groups (n=14). Note: IDU=Intravenous Drug User. Note: Equal Variances not assumed for all independent t-tests. *Possible mean range –9 to +9.

Table 5.28 indicates that the difference between the mean product (belief x outcome) of “will decrease the stigma associated with IDUs” was not significantly different between those who were willing and those who were not willing to provide sterile syringes to known or suspected IDUs.

H5: When perceived behavioral control is present, the attitude construct in the TPB model is a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct.

For **H5**, multiple regression was used to regress willingness on the belief-based constructs of the TPB (attitudes and subjective norms), including only respondents who had perceived behavioral control as depicted in Table 5.29. Respondents with perceived behavioral control scored between +1 and +63 when summing the products of the mean control beliefs and the perceived power of those beliefs for the perceived behavioral control construct.

Multiple regression was also used to regress willingness on the direct measure constructs of the TPB (attitudes and subjective norms), including only respondents who had perceived behavioral control as depicted in Table 5.30. Respondents with perceived behavioral control scored between +1 to +6 when summing the means of the two items used to measure the direct perceived behavioral control construct. For both models using belief-based constructs and direct measure constructs, the beta weight of the attitude variable was examined to assess if the attitude construct in the regression model was a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct.

Table 5.29
Multiple Regression Analysis for Belief-Based Constructs (Attitude and Subjective Norm) when Perceived Behavioral Control is Present

Belief-Based Constructs	**R**	**R^2**	**Adjusted R^2**	**Standardized Beta Coefficients**	**P Values**
	0.683	0.466	0.449		
Attitude				0.578	0.001
Subjective Norm				0.216	0.033

Note: Total sample size is 63. Respondents scored between +1 and +63 on the Belief-Based Perceived Behavioral Control Score.
Note: Dependent Variable = Willingness.
Note: Overall significance of model F=26.631, d.f. = 2, 61, p<0.001.

As shown in Table 5.29, the belief-based constructs of attitude and subjective norm accounted for 46.6 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected IDUs for respondents who had perceived behavioral control over this issue. The belief-based attitude and subject norm constructs were significant predictor variables in the model with attitude being a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct when respondents perceived they had control over the issue. Therefore, **H5** was supported for the model using belief-based constructs. Overall, the model was statistically significant (F=26.631, d.f.=2, 61, p<0.001).

Table 5.30
Multiple Regression Analysis for Direct Measure Constructs (Attitude and Subjective Norm) when Perceived Behavioral Control is Present

Direct Measure Constructs	R	R^2	Adjusted R^2	Standardized Beta Coefficients	P Values
	0.796	0.634	0.623		
Attitude				0.628	0.001
Subjective Norm				0.227	0.022

Note: Total sample size is 71. Respondents scored between +1 and +6 on the Direct Measure Perceived Behavioral Control Score.
Note: Dependent Variable = Willingness.
Note: Overall significance of model F=59.645, d.f. = 2, 69, p<0.001.

As shown in Table 5.30, the direct measure constructs of attitude, subjective norm, and positive perceived behavioral control accounted for 63.4 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected intravenous drug users. The direct measure attitude and subjective norm constructs were significant predictor variables in the model with the attitude construct being a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct when the respondents perceived they had control over this issue. **H5** was supported for the model using direct measure constructs. Overall, the model was statistically significant (F=59.645, d.f.=2, 69, p<0.001).

H6: The perceived behavioral control construct significantly increases the explanatory power of the regression model when only using attitudes and subject norms constructs to explain willingness to provide sterile syringes to known or suspected IDUs.

Analysis for **H6** consisted of a hierarchical multiple regression analysis shown in Table 5.31. To determine if the addition of perceived behavioral control accounts for a significant increase in the variance explained beyond the TRA constructs (attitude, subjective norm), perceived behavioral control was entered in a last separate step (after the TRA constructs).

Table 5.31
Results of Hierarchical Regression Analysis for Belief-Based Measure Constructs

Block Sequence	Variables	R^2	Adjusted R^2	R^2 Change	F Change	Standardized Beta in Final Equation	P Values of Standardized Beta
	Attitude					0.539	0.001
Block 1[a]	Subjective Norm	0.360	0.350	0.360	37.687[c]	0.138	0.053
Block 2[b]	Perceived Behavioral Control	0.371	0.356	0.011	2.230[d]	0.105	0.138

Note: N=136.
Note: Block sequence indicates the step in which the variables were entered into the regression model.
Note: Dependent Variable=Willingness.
[a]Model: Willingness = Belief-Based Attitude + Belief-Based Subjective Norm.
[b]Model: Willingness = Belief-Based Attitude + Belief-Based Subjective Norm + Belief-Based Perceived Behavioral Control.
[c]d.f.=2, 134, p<0.001.
[d]d.f.=1, 133, p=0.138.

The belief-based measures of attitude, subjective norm, and perceived behavioral control accounted for 37.1 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected IDUs (R^2 = 0.371). Belief-based attitude and subjective norm accounted for 36.0 percent variance in willingness (R^2 change = 0.360, F change = 37.687, d.f.=2, 134, p<0.001) when they were the only two variables in the model. Belief-based perceived behavioral control did not account for any statistically significant variance in willingness when entered into the model. Therefore, **H6** was not supported. Belief-based attitude and subjective norm were both significant predictor variables (p<0.05) in the TRA model (Block 1). Only belief-based attitude (p<0.001) was a significant predictor of willingness in the TPB model (Block 2).

Table 5.32 shows the analysis of a hierarchical multiple regression analysis to determine if the addition of the direct measure of perceived behavioral control accounts for a significant increase in the variance explained beyond the TRA constructs (direct measure attitude and direct measure subjective norm).

Table 5.32
Results of Hierarchical Regression Analysis for Direct Measure Constructs

Block Sequence	Variables	R^2	Adjusted R^2	R^2 Change	F Change	Standardized Beta in Final Equation	P Values of Standardized Beta
	Attitude					0.658	0.001
Block 1[a]	Subjective Norm	0.731	0.728	0.731	210.920[c]	0.200	0.001
Block 2[b]	Perceived Behavioral Control	0.735	0.730	0.004	2.277[d]	0.076	0.133

Note: N=157.
Note: Block sequence indicates the step in which the variables were entered into the regression model.
Note: Dependent Variable=Willingness.
[a]Model: Willingness = Direct Measure Attitude + Direct Measure Subjective Norm.
[b]Model: Willingness = Direct Measure Attitude + Direct Measure Subjective Norm + Direct Measure Perceived Behavioral Control.
[c]d.f.=2, 155, p<0.001.
[d]d.f.=1, 154, p=0.133.

The direct measures of attitude, subjective norm, and perceived behavioral control accounted for 73.5 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected IDUs (R^2 = 0.735). Direct measures of attitude and subjective norm were both significant predictors of willingness (P<0.001) and accounted for 73.1 percent variance in willingness (R^2 change = 0.731, F change =210.920, d.f.=2, 155, p<0.001) when they were the only two variables entered into the regression model. When the direct measure of perceived behavioral control was entered into the regression model, an additional 0.4 percent variance was explained. The direct measure perceived behavioral control did not account for any statistically significant variance when entered into the model. Therefore, **H6** was not supported using direct measure constructs. Direct measure attitude and subjective norm were both significant predictor variables ($p<0.01$) in the TRA model (Block 1) as well as the TPB model (Block 2).

> **H7**: The recent past behavior construct significantly increases the explanatory power of the regression model using the constructs of the TPB to explain willingness to provide sterile syringes to known or suspected IDUs.

Analysis for **H7** consisted of a hierarchical multiple regression analysis as shown in Table 5.33. To determine if the addition of the recent past behavior construct accounts for a significant increase in the variance explained beyond the belief-based TPB constructs (attitude, subjective norm, perceived behavioral control), recent past behavior was entered in a last separate step (after the belief-based TPB constructs).

Table 5.33
Results of Hierarchical Regression Analysis for Recent Past Behavior Construct with Belief-Based Theory of Planned Behavior Constructs

Block Sequence	Variables	R^2	Adjusted R^2	R^2 Change	F Change	Standardized Beta in Final Equation	P Values of Standardized Beta
	Attitude					0.399	0.001
Block 1[a]	Subjective Norm	0.371	0.356	0.371	26.099[c]	0.130	0.036
	Perceived Behavioral Control					0.080	0.190
Block 2[b]	Recent Past Behavior	0.527	0.513	0.157	43.788[d]	0.423	0.001

Note: N=138.
Note: Block sequence indicates the step in which the variables were entered into the regression model.
Note: Dependent Variable=Willingness.
[a]Model: Willingness = Belief-Based Measure Attitude + Belief-Based Measure Subjective Norm + Belief-Based Measure Perceived Behavioral Control.
[b]Model: Willingness = Belief-Based Measure Attitude + Belief-Based Measure Subjective Norm + Belief-Based Measure Perceived Behavioral Control + Recent Past Behavior.
[c]d.f.=3, 133, p<0.001.
[d]d.f.=1, 132, p<0.001.

The belief-based measures of TPB (attitude, subjective norm and perceived behavioral control) and recent past behavior accounted for 52.7 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected IDUs (R^2 = 0.527). Belief-based measures of TPB (attitude, subjective norm and perceived behavioral control) accounted for 37.1 percent of the variance in willingness (R^2 change = 0.371, F change = 26.099, d.f.=3, 133, p<0.001) when they were the only variables entered into the regression model. Only belief-based attitude was a significant predictor of willingness (p<0.001) to provide sterile syringes to known or suspected IDUs. When recent past behavior was entered into the regression model, 15.7 percent more variance was accounted for in the prediction of willingness. When all four constructs were entered into the regression model, belief-based attitude, subjective norm and the recent past behavior construct were significant predictors of willingness ($p<0.05$). Therefore, **H7** was supported using the belief-based TPB constructs.

To determine if the addition of the recent past behavior construct accounts for a significant increase in the variance explained beyond the direct measure TPB constructs (attitude, subjective norm, perceived behavioral control), recent past behavior was entered in a last separate step (after the belief-based TPB constructs) as shown in Table 5.34.

Table 5.34
Results of Hierarchical Regression Analysis for Past Behavior Construct with Direct Measure Theory of Planned Behavior Constructs

Block Sequence	Variables	R^2	Adjusted R^2	R^2 Change	F Change	Standardized Beta in Final Equation	P Values of Standardized Beta
	Attitude					0.596	0.001
Block 1[a]	Subjective Norm	0.735	0.730	0.735	142.531[c]	0.192	0.001
	Perceived Behavioral Control					0.024	0.627
Block 2[b]	Recent Past Behavior	0.759	0.753	0.024	15.087[d]	0.187	0.001

Note: N=158.
Note: Block sequence indicates the step in which the variables were entered into the regression model.
Note: Dependent Variable=Willingness.
[a]Model: Willingness = Direct Measure Attitude + Direct Measure Subjective Norm + Direct Measure Perceived Behavioral Control.
[b]Model: Willingness = Direct Measure Attitude + Direct Measure Subjective Norm + Direct Measure Perceived Behavioral Control + Recent Past Behavior.
[c]d.f.=3, 154, p<0.001.
[d]d.f.=1, 153, p<0.001.

The direct measures of TPB (attitude, subjective norm, and perceived behavioral control) and recent past behavior accounted for 75.9 percent of the variance in the prediction of willingness to provide sterile syringes to known or suspected IDUs (R^2 = 0.759). Direct measures of TPB (attitude, subjective norm and perceived behavioral control) accounted for 73.5 percent of variance in willingness (R^2 change = 0.735, F change = 142.531, d.f.=3, 154, $p<0.001$) when they were the only variables entered into the regression model. Both direct measures of attitude and subjective norm were significant predictors of willingness ($p<0.001$) to provide sterile syringes to known or suspected IDUs. When recent past behavior was entered into the regression model, 2.4

percent more variance was accounted for in the prediction of willingness. When all four constructs were entered into the regression model, direct measures of attitude, subjective norm and recent past behavior were significant predictors of willingness ($p<0.001$). Therefore, **H7** was supported using the direct measure TPB constructs.

> **H8**: Female community pharmacists will have significantly more positive attitudes than male community pharmacists toward the provision of sterile syringes to known or suspected IDUs.

Analysis for **H8** consisted of a two-tailed t-test to test the mean difference in attitudes between female and male respondents.

Male respondents held more positive belief-based attitudes than female community pharmacists toward the provision of sterile syringes to known or suspected IDUs (male: N=94; M=0.45, SD=29.57; female: N=64, M=-3.58; SD=30.47). The mean difference between female and male respondents was not statistically significant. For direct measure attitudes, male respondents also held more positive direct measure attitudes (male: N=100, M=-0.55, SD=9.85: female: N=64; M=-0.64, SD=9.67). The mean difference between female and male respondents was not statistically significant. There were no gender differences for subjective norms and perceived control constructs. Therefore, **H8** was not supported.

No significant gender differences were found regarding the willingness to provide sterile syringes to known or suspected IDUs. Overall, both female and male respondents were not willing to provide sterile syringes to known or suspected IDUs (female: N=67, M=-0.36, SD=2.32; male: N=102; M=-0.40, SD=2.22). There was no significant mean difference between genders regarding recent past behavior.

Demographic/Practice Characteristics and the Theory of Planned Behavior Constructs

For those respondents who are knowledgeable about their pharmacy's policy regarding the provision of sterile syringes to known or suspected IDUs, t-tests were conducted to determine if significant differences in means of attitudes, subjective norms, perceived behavioral control, willingness and recent past behavior existed between respondents working under a policy supporting the provision of sterile syringes and respondents working under a policy not supporting the provision of sterile syringes. Table 5.35 shows the t-test values for attitudes, subjective norms, perceived behavioral control, willingness and recent past behavior between respondents working under a policy supporting the provision of sterile syringes and respondents working under a policy not supporting the provision of sterile syringes.

Table 5.35
Differences in Means of Attitudes, Subjective Norms, Perceived Behavioral Control, Willingness and Recent Past Behavior Between Respondents Working Under a Policy Supporting and Not Supporting the Provision of Sterile Syringes

Variables	Policy Support Mean (SD) (N)	Policy Does Not Support Mean (SD) (N)	t-Test (P Values)
Belief-Based Attitude[a]	3.00 (30.93) (13)	-13.27 (27.71) (41)	1.69 (p=0.107)
Belief-Based Subjective Norm[b]	7.82 (18.24) (11)	2.79 (25.76) (39)	0.73 (p=0.473)
Belief-Based Perceived Behavioral Control[c]	-1.00 (17.18) (13)	-3.18 (15.67) (40)	0.41 (p=0.690)
Direct Measure Attitude[d]	4.33 (10.05) (12)	-5.81 (8.66) (42)	3.18 (p=0.006)
Direct Measure Subjective Norm[e]	0.42 (1.78) (12)	-0.98 (1.70) (43)	2.42 (p=0.027)
Direct Measure Perceived Behavioral Control[f]	2.00 (2.83) (13)	-0.05 (2.81) (43)	2.29 (p=0.033)
Recent Past Behavior[e]	0.00 (2.27) (13)	-2.30 (1.26) (43)	3.49 (p=0.003)
Willingness[e]	0.46 (2.26) (13)	-1.45 (1.91) (40)	2.75 (p=0.013)

Note: Equal Variances not assumed for all t-tests.
[a]Possible mean range from –90 to +90; [b]Possible mean range from –81 to +81.
[c]Possible mean range from –63 to +63; [d]Possible mean range from –18 to +18.
[e]Possible mean range from -3 to +3; [f]Possible mean range from –6 to +6.

Significant mean differences existed between respondents working under a policy supporting the provision of sterile syringes to known or suspected IDUs and respondents working under a policy not supporting the provision of sterile syringes to known or suspected IDUs for willingness, recent past behavior and the direct measure constructs of the TPB (attitude, subjective norm, perceived behavioral control). No significant mean differences existed between respondents working under a policy supporting the provision of sterile syringes to known or suspected IDUs and respondents working under a policy not supporting the provision of sterile syringes to known or suspected IDUs for belief-based measures of the TPB (attitude, subjective norm, perceived behavioral control).

To determine if there were any differences in respondent's willingness to provide sterile syringes to known or suspected IDUs, recent past behavior, and the belief-based and direct measure constructs of the TPB (attitude, subjective norm, perceived behavioral control) based on ethnicity, independent t-tests were conducted. Due to the large number of Caucasian-Americans/White respondents (N=137), African-American/Black (N=9), American Indian or Alaskan Native (N=1), Asian-American/Oriental (N=7), Mexican-American or Other Hispanic Origin (N=16), and Other (N=2) were all placed in the "Other" category (N=35) for statistical purposes. A t-test (t=-2.63, d.f.=39, p=0.012) showed that the mean for the belief-based perceived behavioral control construct for Caucasian-American/Whites (M=-0.47, SD=13.36) was statistically lower than respondents in the "Other" category (M=9.55, SD=20.77). No other significant differences in means were found based on ethnicity.

One-way ANOVAs showed no significant mean differences existed among current job title for willingness (F=0.661, d.f.=4, 160, p=0.620), recent past behavior (F=0.948, d.f.=4, 162, p=0.438) and the belief-based constructs of the TPB (attitudes {F=0.693, d.f.=153, p=0.598}, subjective norms {F=0.902, d.f.=4, 152, p=0.464}, and perceived behavioral control {F=1.51, d.f.=4, 153, p=0.203}). One-way ANOVAs also showed no significant mean differences existed among current job title for the direct measure constructs for the TPB.

To determine if there were any differences in respondents' willingness to provide sterile syringes to known or suspected IDUs, recent past behavior, and the belief-based constructs of TPB based on practice setting (community independent, community-chain, other), one-way ANOVAs were conducted. Due to the small number of respondents working in community clinics (N=1) and respondents working in the "Other" category (N=5), the two groups were combined for statistical purposes. One-way ANOVAs showed no statistically significant differences among current practice setting and willingness (F=1.52, d.f.=2, 163, p=0.222), recent past behavior (F=0.61, d.f.=2, 167, p=0.542) and the belief-based constructs of TPB (attitudes {F=0.48, d.f.=2, 152, p=0.953}, subjective norms {F=1.84, d.f.=2, 155, p=0.162} and perceived behavioral control {F=0.86, d.f.=2, 156, p=0.424}). One-way ANOVAs also showed no significant mean differences existed among current practice setting for the direct measure constructs for the TPB. No statistically significant differences were also found between practice area and willingness, recent past behavior and the belief-based and direct measure constructs of the TPB.

Pearson's correlation analyses did not show any statistically significant relationships between respondents' age and willingness ($r=0.023$, $p=0.771$), recent past behavior ($r=-0.051$, $p=0.508$), and the belief-based constructs of TPB (attitude {$r=0.067$, $p=0.404$}, subjective norms {$r=0.097$, $p=0.225$}, perceived behavioral control {$r=0.022$, $p=0.784$}). No statistically significant relationships were found between age and the direct measure TPB constructs as well. However, age was significantly correlated with hours worked per week in primary place of employment ($r=-0.184$, $p=0.018$) and hours spent dispensing prescriptions per week ($r=-0.166$, $p=0.033$).

Pearson's correlation analyses did show statistically significant relationships between number of hours worked per week in primary place of employment and willingness ($r=-.163$, $p=0.037$), direct measure subject norm ($r=-.175$, $p=0.024$), years in practice ($r=-.173$, $p=0.25$) and number of hours dispensing prescriptions ($r=.719$, $p<0.001$). Pearson's correlation analyses also showed statistically significant relationships between number of hours dispensing prescriptions per week and willingness ($r=-.165$, $p=0.035$), direct measure attitude ($r=-.184$, $p=0.020$), direct measure subject norm ($r=-.171$, $p=0.029$), and number of hours worked per week in primary place of employment ($r=.719$, $p<0.001$).

Assumptions of Linear Regression

It is often not known in advance whether or not a linear regression is appropriate. The assumptions of linear regression are normality of the conditional distributions of the dependent variables, homoscedasticity (or that the variance of errors is the same across all levels of the independent variable), linearity between the dependent and independent variables and independent observations from a random sample. An examination of the residuals must be undertaken to determine whether the assumptions of normality, constant variance, and linearity have been violated.

Normality. The assumption of normality was assessed by evaluating a histogram of the standardized residuals for each regression analysis as well as cumulative plots of the residuals. Normality is the assumption that the conditional distribution of the dependent variable is normal. If the sample is drawn from an independently and randomly sampled population and the relationship between the dependent variable and the independent variable is linear, then the standardized residuals of the regression analysis will have a normal distribution. Standardized residuals were plotted for each of the regression models in Appendix E. The histograms of the residual distributions appeared to be fairly normal.

Appendix F shows the cumulative probability plots of the residuals. A cumulative probability plot is a plot of residuals against a standard normal distribution which is used as a reference line (Univariate, 1988). If the data are from a normal distribution, the data should tend to fall along the reference line. Observation of the cumulative probability plots indicated that the data appeared to be from a fairly normal distribution.

Homoscedasticity. The assumption of homoscedasticity (equal variances) was evaluated by plotting the standardized residuals against the standardized predicted value of the dependent variable. Appendix G shows the scatterplots for the regression models. The residuals for all of the scatterplots appear to be fairly evenly distributed, and therefore, the assumption of constant variance was not violated by this data. Appendix H shows partial regression plots of the TPB constructs and recent past behavior against the dependent variable. Visual examination shows that the residuals are evenly scattered around zero (the horizontal line).

Linearity. The assumption of linearity was evaluated by plotting each independent variable against the dependent variable (Appendix H). If any pattern is evident in any of the plots, there may be reason to suspect the relationship is not linear (Reg. 1988). Visual examination of the partial plots did not indicate that there is any definite relationship between the independent and dependent variables. Therefore, the assumption of linearity was not violated by the data.

Multicollinearity. Multicollinearity is the strong relationship between the independent variables (Norusis, 1993). Multicollinearity makes it difficult to determine the particular effects of individual variables since collinear variables provide similar information concerning the explained variance in regression models. Multicollinearity was assessed by examining absolute values of correlation coefficients of the regression variables, variance inflation factors, and eigenvalues.

Table 5.36 and 5.37 show the correlation matrices between both belief-based and direct measure TPB constructs and the dependent variable.

Table 5.36
Correlation Matrix for Belief-Based Theory of Planned Behavior Constructs, Recent Past Behavior and Willingness

	Will	ATT	SN	PBC	PB
Will	1.00				
ATT	.636	1.00			
SN	.191	.160	1.00		
PBC	.183	.173	.097	1.00	
PB	.604	.400	.024	.117	1.00

LEGEND:
WILL= Willingness
ATT=Belief-Based Attitude
SN=Belief-Based Subjective Norm
PBC=Belief-Based Perceived Behavioral Control
PB=Recent Past Behavior
Note: All values are absolute values.

Table 5.37
Correlation Matrix for Direct Measure Theory of Planned Behavior Constructs, Recent Past Behavior and Willingness

	Will	ATT	SN	PBC	PB
Will	1.00				
ATT	.845	1.00			
SN	.689	.708	1.00		
PBC	.557	.574	.441	1.00	
PB	.604	.516	.397	.499	1.00

LEGEND:
WILL= Willingness
ATT=Direct Measure Attitude
SN=Direct Measure Subjective Norm
PBC=Direct Measure Perceived Behavioral Control
PB=Recent Past Behavior
Note: All values are absolute values.

Correlation coefficients >0.75 indicate high multicollinearity (Graphpad, 1990). Overall, multicollinearity is not a problem upon examining the absolute correlation coefficients for the independent variables.

Variance Inflation Factors (VIF) show how well one explanatory variable can be explained by all the other explanatory variables in the equation. The higher the VIF value, the more severe the effects of multicollinearity in the regression equation. There are no formal criteria on acceptable VIF values. VIF has a range from 1 to infinity. Serious multicollinearity occurs if VIF>5 (Economics, 2002). The tolerance value has a range from zero to one. The closer the tolerance values are to zero, the more severe the multicollinearity. Table 5.38 shows the values of VIF and tolerance values. Examination of the data showed that there were no VIF values greater than 2.523 for the independent variables.

Table 5.38
Variance Inflation Factors (VIF) of Independent Variables

Independent Variables	Tolerance	VIF
Belief-Based Attitude	.847	1.181
Belief-Based Subjective Norm	.951	1.051
Belief-Based Perceived Behavioral Control	.961	1.041
Direct Measure Attitude	.396	2.523
Direct Measure Subjective Norm	.494	2.024
Direct Measure Perceived Behavioral Control	.627	1.595
Recent Past Behavior (Belief-Based Model)	.878	1.139
Recent Past Behavior (Direct Measure Model)	.679	1.473

Diagnostic analysis involving eigenvalues and condition indexes allows the researcher to determine if collinear data are present and to what degree the collinearity has weakened the estimated parameters (Norusis, 1993). Table 5.39 shows the results of the collinearity diagnostics. Examination of the data showed that there were no large differences between eigenvalues and condition indexes of the independent variables. If some eigenvalues are much larger than others, this is indicative of the related variables loading together. Eigenvalues close to zero indicate a high degree of collinearity. Therefore, collinearity among the independent variables was not a problem with this data.

Table 5.39
Collinearity Diagnostics of Independent Variables

Independent Variable	Eigenvalue	Condition Index
Belief-Based Attitude	1.298	1.132
Belief-Based Subjective Norm	.870	1.383
Belief-Based Perceived Behavioral Control	.707	1.534
Direct Measure Attitude	1.362	1.353
Direct Measure Subjective Norm	.571	2.086
Direct Measure Perceived Behavioral Control	.321	2.786
Recent Past Behavior (Belief-Based Model)	.459	1.903
Recent Past Behavior (Direct Measure Model)	.248	3.171

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CHAPTER 6

DISCUSSION

This chapter is divided into four sections. The first section is a summary and discussion of the results of the data analyses, focusing on relevant significant and important findings. The second section discusses the suggestions for further research. The third section offers discussion of study limitations followed by conclusions in the final section.

The purpose of this study was to achieve a better understanding of why community pharmacists' were willing or not willing to provide sterile syringes to known or suspected intravenous drug users (IDUs). The goal of this research study was to assess the relative importance of each construct in the Theory of Planned Behavior (TPB) (Ajzen and Fishbein, 1980) (attitude, subjective norm and perceived behavioral control) as well as recent past behavior in the prediction of Texas community pharmacists' willingness to provide sterile syringes to known or suspected intravenous drug users (IDUs).

Focus Group Differences

It is interesting to note several differences from the focus group sessions and the findings from the study. The discussions during the focus group sessions appeared highly charged both on moral/ethical and professional levels. Focus group participants appeared to have strong positive or negative beliefs/opinions toward the provision of sterile syringes without much neutrality. Findings from the study regarding attitudes did not reflect the extreme positions as in the focus group discussions. Also, during the focus group sessions, church and family/spouse were discussed thoroughly as very important referent groups influencing focus group participants regarding the provision of sterile syringes to known or suspected IDUs. However, results of the larger study indicated that pharmacists were not influenced by groups/persons regarding the provision of sterile syringes. Despite differences, focus groups were helpful in exploring salient beliefs toward the provision of sterile syringes to known or suspected IDUs.

Sample Characteristics

The sample used in this study included practicing Texas community pharmacists. From the standpoint of generalization of study results, it is important to compare the demographic characteristics of the study's sample to the demographic characteristics of licensed Texas community pharmacists (Texas, 2002) as shown in Table 6.1. Despite the over-sampling of ethnic minority Texas pharmacists, ethnic minority Texas pharmacists were somewhat underrepresented when compared to the 2002 census data. Overall, sample characteristics were not drastically different than the 2002 census data. Therefore, the study's sample is fairly representative of Texas community pharmacists in terms of demographic characteristics.

Table 6.1
Sample Characteristics Compared to Texas Community Pharmacist Population (2002 Census Data)

	2002 Census Data % of Total	Study Sample % of Total
Gender*		
Male	56.0	59.5
Female	44.0	40.5
Ethnicity*		
American Indian	0.7	0.6
Asian	11.2	4.1
African-American	11.2	5.2
Hispanic	8.6	9.3
Caucasian	67.3	79.7
Other	0.9	1.2
Practice Setting		
Community-Independent	26.9	27.6
Community-Chain	71.5	68.8
Community-Other	1.4	3.5

Note: Study sample consists of practicing Texas community pharmacists, whereas, 2002 census data consists of all Texas licensed pharmacists residing in Texas.
*Gender and Ethnicity percents for the 2002 census data are for all licensed Texas pharmacists residing in Texas.

Willingness. Out of the 170 pharmacists who responded to the "willingness" question, 50.5 percent of the responses (N=86) were between –1 and –3, indicating respondents were not willing to provide sterile syringes to known or suspected IDUs, even though Texas has no prescription law or state pharmacy board regulations governing the provision of sterile syringes. Therefore, decisions to provide sterile syringes to known or suspected IDUs are largely left to the discretion of the pharmacist which has been shown throughout the literature (Compton et al, 1992; Jones and Coffin, 2002;

Taussig, et al., 2002). Public health programs should be developed to encourage pharmacists to participate in more harm reduction strategies.

Significant mean differences in willingness existed between respondents working under a policy supporting the provision of sterile syringes to known or suspected IDUs and respondents working under a policy not supporting the provision of sterile syringes to known or suspected IDUs. The finding for willingness was expected. For pharmacists working under a policy not supporting the provision of sterile syringes to known or suspected IDUs, it was expected that pharmacists would not be willing (M=-1.45, SD=1.91) to provide sterile syringes to IDUs, whereas, pharmacists working under a policy supporting the provision of sterile syringes to known or suspected IDUs were willing to provide sterile syringes (M=0.46, SD=2.26).

Attitudes. Overall, the results showed that Texas community pharmacists held a slightly unfavorable attitude toward providing sterile syringes to known or suspected IDUs, which was shown to be a significant predictor of willingness using the belief-based measures of TPB. Therefore, organizations that wish to encourage pharmacists to provide sterile syringes to known or suspected IDUs should focus efforts on modifying pharmacists' attitudes toward the provision of sterile syringes to IDUs. In order to modify attitudes, pharmacy programs should target strong beliefs that influence attitude. Many studies of pharmacists' attitudes have found similar relationships between attitudes toward IDUs and opposition to the provision of sterile syringes to known or suspected IDUs (Blumenthal et al., 2002; Coffin et al. 2002; Reich et al., 2002).

Similar to other pharmacists' beliefs reported in the literature, Texas community pharmacists had strong beliefs for or against the provision of syringes to IDUs. Texas community pharmacists' concerns about staff safety and damaging effects on business agree with other findings (Blumenthal et al., 2002; Case, Beckett and Jones, 1998; Sheridan et al., 1997; Wright-De Aguero et al., 1998). Texas community pharmacists believed that providing sterile syringes to IDUs would increase the number of IDUs in the pharmacy, increase shoplifting and other thefts/crime in the pharmacy and increase safety concerns for the pharmacy staff/customers, all of which heavily influenced negative outcomes. According to Blumenthal et al. (2002), educational programs could provide pharmacists with more information regarding positive and negative experiences of pharmacists who provide sterile syringes to known or suspected IDUs. As discussed in the literature review, it is important to mention that very few serious incidents were reported in pharmacist surveys that specifically addressed negative experiences associated with syringe sales (Case, Beckett, and Jones, 1998). Considering beliefs regarding the safety issue, respondents would be fairly unlikely to provide sterile syringes to known or suspected IDUs.

Texas community pharmacists believed that providing sterile syringes to known or suspected IDUs would encourage drug use, increase the accessibility of sterile syringes to IDUs and require more time from the pharmacist. Such findings are consistent with the literature in that pharmacists tend to view IDUs in a negative light (Binkley et al., 1995; Blumenthal et al., 2002; Katz, Draugalis and Lai, 1995; Cockerill et al., 1996; Valdiserri, 2002; Herek, Capitanio and Widaman, 2002). It is important to note that

Texas community pharmacists did not believe that the provision of sterile syringes to known or suspected IDUs would decrease the stigma associated with IDUs. They believed that decreasing the stigma associated with IDUs was somewhat bad. It is evident in this study that respondents held negative views regarding appearances (e.g., unkept, dirty, thin, unhealthy, strung-out) toward known or suspected IDUs. Such responses imply that pharmacists' opinions/beliefs toward IDUs can impact pharmacists' IDU-related services. Pharmacy programs need to be developed to address whether the perceptions and discomfort regarding the provision of sterile syringes to known or suspected IDUs are accurate.

Despite the belief that the provision of sterile syringes to IDUs would decrease the spread of HIV and other blood-borne pathogens as well as decrease healthcare costs, Texas community pharmacists did not believe that providing sterile syringes to IDUs would provide opportunities to counsel and/or offer treatment referrals to IDUs. Pharmacy schools and continuing educational programs could discuss HIV and other blood-borne pathogens prevention as well as the provision of syringes in the context of the pharmacist's role in counseling patients, including those with drug addictions (Blumenthal et al., 2002). Pharmacists could also be more involved in counseling patients regarding HIV and tuberculosis testing. Perhaps pharmacists should be made more aware that providing syringes to IDUs for disease prevention has a legitimate medical purpose.

It has been clearly shown in the literature that pharmacists have differing personal beliefs about IDUs and the provision of sterile syringes to known or suspected IDUs.

Results from this study show that those who are willing and those who are not willing to provide sterile syringes to known or suspected IDUs held different beliefs and attitudes, suggesting any intervention addressing the provision of sterile syringes should be tailored to personal circumstances. Evidence of misinformation among pharmacists and the general willingness of pharmacists to involve themselves in prevention efforts indicate that education programs to increase awareness of pharmacists' role in preventing blood-borne disease transmission through voluntary sale of syringes to all customers could be valuable (Reich et al., 2002).

Overall, the respondents held an unfavorable direct measure attitude toward the provision of sterile syringes to known or suspected IDUs. Negative beliefs consisted of the provision of sterile syringes being somewhat bad, foolish, worthless, and punishing. Positive beliefs consisted of the provision of sterile syringes to being somewhat beneficial and useful. Despite the direction of each belief, all responses were between –1 and +1, indicating pharmacists did not hold strong beliefs in any direction regarding direct measure attitude items. It is possible that the six direct measure beliefs included in the survey were not salient beliefs, and therefore, respondents were not likely to have formed a strong opinion in any direction for each direct measure belief.

Since attitude toward the provision of sterile syringes to known or suspected IDUs proved to be a significant predictor of willingness, an understanding of the factors explaining attitude can provide public health officials with insight that may be helpful to increase the rate and extent of Texas community pharmacists providing such services. Anecdotal comments written by some respondents on their questionnaires confirm that the provision of sterile syringes to known or suspected IDUs is a highly charged moral and ethical issue. Given the nature of the study topic, the attitude score was expected. The results of the study should not be surprising since pharmacists and other health care professional often stigmatize IDUs. Such attitudes may be due to past experiences respondents have had with IDUs or it may be due to the respondent's perceptions of IDUs.

Perceived Behavioral Control. Statistics showed that the mean for the belief-based perceived behavioral control construct for Caucasian-American/Whites was lower than that of ethnic minorities. It is plausible that Caucasians may feel they have less control and feel that they must abide by rules/policy/protocol more than ethnic minorities. More research should be conducted in this area. This finding should be reviewed with caution since the perceived behavioral construct is the most unreliable and difficult to measure of the TPB constructs. No other significant differences in means were found based on ethnicity. It is important to note that no known studies addressed differences in ethnicity regarding willingness to provide sterile syringes to known or suspected IDUs.

Recent Past Behavior. It is important to note that the past behavior item measured recent past behavior (within the last three months) which is very different than "ever" providing sterile syringes to known or suspected IDUs." As discussed earlier, it is likely that those respondents who provided sterile syringes in the last three months would be more willing to provide sterile syringes to known or suspected IDUs. Interestingly, there were no significant differences in recent past behavior based on gender, ethnicity, practice setting and practice area. However, it makes sense that pharmacists working under a policy not supporting the provision of sterile syringes to known or suspected IDUs were not willing to provide sterile syringes to IDUs compared to those pharmacists working under a policy supporting the provision of sterile syringes to known or suspected IDUs. Two explanations are possible. One explanation is that this finding may indicate that social norms such store managers and/or store policy may influence respondents' willingness to provide sterile syringes to known or suspected IDUs. Another possible explanation for this finding is that pharmacists may prefer to work in environments that support their attitudes on the issue, and therefore, their own attitudes are influencing their willingness to provide sterile syringes to known or suspected IDUs more than external social norms/influences.

Gender. It was hypothesized that female community pharmacists would have significantly more positive attitudes than male community pharmacists toward the provision of sterile syringes to known or suspected IDUs. The hypothesis was disconfirmed. Male respondents held more positive belief-based attitudes than female community pharmacists (male: N=94; mean=0.45, SD=29.57; female: N=64, mean= -3.58; SD=30.47). It is interesting to note that female community pharmacists held negative attitudes toward the provision of sterile syringes to IDUs which opposes findings found in the literature where females appeared more tolerant toward HIV/AIDS with a significantly greater proportion of female pharmacists stating they would be comfortable filling prescriptions for HIV/AIDS patients, homosexuals, and IDUs

(Binkley et al. 1995) study. There were no studies found within the literature addressing the provision of sterile syringes to known or suspected to IDUs among male and female pharmacists. It is possible that female pharmacists may feel more comfortable filling prescriptions for IDUs but not necessarily providing sterile syringes to IDUs. The natures of the two behaviors are different. Perhaps female pharmacists are more concerned about safety issues when providing sterile syringes to known or suspected IDUs. This finding conflicts with the Meyers et al. (1998) study where the authors commented that female pharmacists may be more likely than male pharmacists to prioritize patient care over business. Surprisingly, male pharmacists held slightly favorable attitudes toward the provision of sterile syringes to known or suspected IDUs. Overall, both males and females did not hold strong attitudes in any direction given the range of the attitude score (–90 to +90). The mean difference in attitudes between male and female community pharmacists was not statistically significant. Similar findings were found for the direct measure attitude construct as well (male: N=100, mean=-0.55, SD=9.85: female: N=64; mean=-0.64, SD=9.67). The mean difference was not statistically significant. Both men and women held slightly unfavorable attitudes toward the provision of sterile syringes.

No significant gender differences were found regarding the willingness to provide sterile syringes to known or suspected IDUs and recent past behavior. Even though the finding was not statistically significant, the finding that female Texas community pharmacists did not provide sterile syringes to known or suspected IDUs as often as male

Texas community was expected since female respondents held slightly more unfavorable attitudes toward the provision of sterile syringes to IDUs compared to male respondents.

Policy. Significant mean differences existed between respondents working under a policy supporting the provision of sterile syringes to known or suspected IDUs and respondents working under a policy not supporting the provision of sterile syringes to known or suspected IDUs for willingness, recent past behavior and the direct measure constructs of TPB (attitude, subjective norm, perceived behavioral control). The findings regarding recent past behavior and willingness were expected. For pharmacists working under a policy not supporting the provision of sterile syringes to known or suspected IDUs, it was expected that pharmacists would not be willing (mean=1.44, SD=1.91) to provide sterile syringes to IDUs as well as not have provided sterile syringes to IDUs very often within the last three months (mean=-2.30, SD=1.26). Pharmacists only "sometimes" provided sterile syringes to known or suspected IDUs within the last three months even when working under a policy supporting that behavior, indicating the involvement of personal discretion in the decision making process. Results indicate that pharmacy policy affects attitudes, social influences and perceived behavioral control issues. Pharmacists working under a policy not supporting the provision of sterile syringes to IDUs held unfavorable attitudes, were not influenced by social norms and did not think they had to control over the issue, whereas, pharmacists working under a policy supporting the provision of sterile syringes to IDUs held favorable attitudes, were somewhat influenced by social norms and believed to have control over the issue. It is important to note that no significant mean differences in belief-based measures existed between respondents working under a policy supporting the provision of sterile syringes to known or suspected IDUs and respondents working under a policy not supporting the provision of sterile syringes to known or suspected IDUs.

Overall, sample characteristics did not significantly influence willingness, recent past behavior and the TPB constructs except for pharmacy policy. Further research should examine factors that influence policy-makers decisions to support or not support the provision of sterile syringes to known or suspected IDUs to help better predict intentions and behaviors.

Evaluation of Study Model

The results of this study suggest that only certain variables from the TPB model (attitude, subjective norm, and perceived behavioral control) yield a significant influence upon respondents' willingness to provide sterile syringes to known or suspected IDUs. Attitude was an important construct when predicting willingness using the belief-based TPB constructs, while attitude and subjective norm were both important constructs when using direct measure constructs of the TPB model to predict willingness. The importance of attitude in the prediction of health-related intentions using the Theory of Reasoned Action (TRA) and TPB models has been well-established (Dilorio, 1997; Godin and Kok, 1996; Millstein, 1996).

Of particular interest was a hypothesized relationship regarding subjective norms that was disconfirmed in the analysis of the data. According to the results of this study, social influences do not contribute to the prediction of willingness to provide sterile syringes to known or suspected IDUs when using belief-based constructs in both the TRA and TPB models. However, social influences did contribute significantly to the prediction of willingness when using direct measure constructs in both the TRA and TPB models. It is possible that the belief-based subjective norm score and the single item direct measure subjective norm score were not measuring the same construct. The belief-based construct was comprised of two components: 1) normative belief and 2) motivation-to-comply. Whereas, the direct measure construct consisted of a single item, "a belief that most people who are important to me (respondent) would approve the provision of sterile syringes to known or suspected IDUs." Perhaps, a second question (a motivation-to-comply question) should have been included in the study questionnaire along with the single subjective norm direct measure item. For example, "If I provide sterile syringes to known or suspected IDUs, I would do what most people who are important to me would want me to do."

Since Texas has no prescription law or state pharmacy board regulation governing the provision of sterile syringes, community pharmacists may not feel pressure to do what individuals/groups important to them would want them to do. Interestingly, out of the nine individuals/groups included in the study questionnaire, respondents were most likely to do what regulatory agencies/legal groups would want them to do. However, respondents felt that regulatory agencies/legal groups had more of a neutral stance toward Texas community pharmacists providing sterile syringes to known or suspected IDUs.

Respondents were most likely not to do what respondents thought IDUs would want them to do, indicating negative beliefs and attitudes toward IDUs.

A general finding within the TRA and TPB literature regarding health behaviors that affect others is that intentions appear to be significantly shaped by social influences, whereas, attitudes appear to significantly influence intentions regarding behaviors that primarily affect the individual performing the behavior (Quine and Rubin, 1997). One would think that social influences would be an important predictor of willingness to provide sterile syringes to IDUs. However, negative attitudes toward IDUs and the provision of sterile syringes to known or suspected IDUs tend to be far more important in the prediction of willingness even though the provision of sterile syringes to known or suspected IDUs affects both pharmacists and IDUs. The literature also shows that subjective norm appears to be less important in the prediction of intentions (willingness) than attitudes (Randall and Gibson, 1991; McCall et al., 1993; Nash, Edwards and Nebauer, 1993). Even in domains where subjective norm reached significance, it was often a weaker predictor than attitude and perceived behavioral control. Therefore, it appears that the provision of sterile syringes to known or suspected IDUs is a personal choice and not so much influenced by others.

Contrary to what was originally hypothesized, perceived behavioral control was not a significant predictor of willingness in either the belief-based or direct measure TPB model, even though both models exhibited an overall significance (belief-based model: $F=26.099$, d.f. = 3, 133, $p<0.001$; direct measure model: $F=142.531$, d.f. = 3, 154, $p<0.001$). Also contrary to what was originally hypothesized, the perceived behavioral control variable did not account for any statistically significant variance in willingness when entered into the regression model when only using attitude and subjective norm (belief-based model: Fchange=2.230, d.f. = 1, 133, p=0.138; direct measure model: Fchange=2.277, d.f. = 1, 134, p=0.133).

Overall, respondents did not perceive they had control over the provision of sterile syringes to known or suspected IDUs. The belief-based perceived behavioral control mean score was 1.48 (SD=15.61, range –51 to +63), indicating that pharmacists felt that they had little control over providing sterile syringes to known or suspected IDUs. The overall direct perceived behavioral control mean score was 0.71 (SD=3.24, range –6 to +6), indicating that pharmacists felt fairly neutral about having complete control over whether or not they would provide sterile syringes and that the provision of sterile syringes is fairly easy to do. The behavior in question and situational characteristics greatly affect the individual contributions of attitudes, subjective norms, and perceived behavioral control.

In most of the health-related studies discussed in the literature review, attitudes and perceived behavioral control were better predictors of intentions (Beale and Manstead, 1991; Blue, 1995; Wambach, 1997). Results showed that the belief-based and direct measure attitude and subject norm constructs were significant predictor variables in the regression model, with attitude being a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs than the subjective norm construct when respondents perceived they had control over whether or not they would provide sterile syringes to known or suspected IDUs. Again, attitude has been confirmed to be a stronger predictor of willingness to provide sterile syringes to known or suspected IDUs for both belief-based and direct measure regression models. This suggest that Texas community pharmacists use personal discretion when providing sterile syringes to known or suspected IDUs when they perceive to have some control over the provision of sterile syringes. Regardless, if perceived behavior control was present, attitude was a strong predictor of willingness in both belief-based and direct measure TRA and TPB models. Attitudes appear to be the driving force behind willingness to provide sterile syringes to known or suspected IDUs.

Recent Past Behavior. The literature has shown that past behavior can improve the predictive power of the TPB (Sheeran, Norman and Armitage, 2000). According to Leone, Perugini and Ercolani (1999), past behaviors predict intention (in this case, willingness) even when perceived behavioral control is included. In this study, the mean for the recent past behavior item was –1.11 (SD=2.07, range –3 to +3), indicating that pharmacists had not often provided sterile syringes to known or suspected IDUs in the last three months. As shown in the results of this study, it was confirmed that the recent past behavior construct significantly increases the explanatory power of the regression model using the belief-based and direct measure constructs of the TPB to explain willingness to provide sterile syringes to known or suspected IDUs. Interestingly, when all four constructs were entered in the regression model, attitude, subjective norm, and recent past behavior constructs were significant predictors of willingness.

Recent past behavior was the strongest predictor of willingness in the belief-based TPB model, whereas, attitude was the strongest predictor of willingness in the direct measure TPB model. There was a positive relationship between willingness and the recent past behavior construct, therefore, pharmacists who have provided sterile syringes to known or suspected IDUs in the past there months were more willing to provide sterile syringes to known or suspected IDUs. It seems intuitive that pharmacists who have negative attitudes toward the provision of sterile syringes to known or suspected IDUs and have not frequently provided syringes to IDUs in the past three months would not be willing to provide sterile syringes to IDUs. Therefore, it is important to change less favorable attitudes to favorable attitudes so that respondents would be more willing to provide sterile syringes to known or suspected IDUs. Although, recent past behavior has been shown to improve the predictive validity of the TPB in this study, it is important to note that the effect of past behavior on intentions (in general) are noticeably decreased from the TRA to the TPB models because of the inclusion of the perceived behavioral control construct (Leone, Perugini and Ercolani, 1999). According to the researchers, the perceived behavioral control component is a self-efficacy based variable, and therefore, can tap into a portion of past behavior effects on intention. Findings regarding recent past behavior in this study are supported within the literature involving other health-related behaviors (Burak, 1994; Quine and Rubin, 1997; Albarracin et al., 2001). Therefore, it is recommended that recent past behavior of Texas community pharmacists should be examined when predicting intentions and behaviors of Texas community pharmacists regarding the provision of sterile syringes to known or suspected IDUs.

Suggestions for Future Research

This study has identified factors that helped explain Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs as well as identified some areas that need further investigation. It is imperative that pharmacists be informed about harm reduction strategies to help reduce the HIV/AIDS and hepatitis C epidemics. To increase awareness, a collaborative effort from public health and pharmacy can provide valuable information to pharmacists regarding the provision of sterile syringes to known or suspected IDUs. Since the level of willingness was low, attitude modification strategies should be examined to increase community pharmacists' willingness to provide sterile syringes to known or suspected IDUs. Results indicate that there is a need for public health professionals to explore community pharmacists' beliefs about providing sterile syringes to known or suspected IDUs in order to encourage pharmacy-based needle exchange programs. Tailoring modification strategies accordingly may increase pharmacists' willingness to provide sterile syringes to known or suspected IDUs. Also, alternatives to pharmacies should be explored regarding the provision of sterile syringes to IDUs such as vending machines, health clinics and mail-order.

The scope of this study was restricted to Texas community pharmacists. Therefore, results cannot be extrapolated to community pharmacists nationwide. With reference to external validity, the findings cannot be generalized to other community pharmacy populations outside of Texas. More diverse populations should be used in future research.

More empirical research involving the provision of sterile syringes to known or suspected IDUs needs to be considered since community pharmacists' education, experience, access to sterile syringes and role in the community make them well-suited for the responsibilities associated with the provision of sterile syringes. It is recommended that the TRA and TPB be used again in a broader pharmacist population to confirm the models' usefulness since this study was the only one of its kind. Future researchers can contribute significantly to our understanding of community pharmacists' willingness to provide sterile syringes to known or suspected IDUs by investigating the importance of additional predictor variables.

Future research should also examine the link between willingness to provide sterile syringes to known or suspected IDUs and actual behavior. Do pharmacists who indicate they are willing to provide sterile syringes to known or suspected IDUs actually provide sterile syringes to known or suspected IDUs? Perhaps it may also be useful to closely examine the constructs of willingness and intentions to see how they are linked with the actual behavior regarding the provision of sterile syringes to known or suspected IDUs.

Limitations

The following limitations should be considered when interpreting the results of the study.

1. Since a 100 percent respondent rate was not obtained, non-participant bias may have posed a potential threat. Despite the use of second mailings to improve

survey response rate, this study only achieved a 35.1 response rate. Since survey responses did not have any unique identifiers, non-responders could not be identified for further analysis. Therefore, the difference between responders and nonresponders could not be determined.

2. Eligible Texas community pharmacists for the study were not provided with a prenotification letter or announcement. Research shows that prenotification letters significantly increase response rates (Schlegelmiclh and Diamantopoulos, 1991). The length of the entire survey may have hindered response rates.
3. The scale of the direct measure subjective norm construct consisted of one item. It may have been more appropriate to add more items to the direct measure subjective norm scale since the belief-based and direct measure subjective norm constructs may not have measured the same construct.
4. This study was cross-sectional in nature. The responses represent variables at a single point in time. Perceptions of the provision of sterile syringes to known or suspected IDUs may change at future points in time. Any event that can affect the constructs of the TPB as they relate to the provision of sterile syringes to IDUs can alter the relationships between variables examined in this study.
5. The perceived behavioral control construct is the least reliable construct in the TPB model which is consistent with the literature. It is difficult to truly measure perceived behavioral control since it is tied to other concepts such as self-efficacy. Therefore, interpretation of results regarding perceived behavioral control should be viewed with caution.

Conclusion

An astounding 30 to 40 percent of all HIV/AIDS cases in the U.S. are directly or indirectly tied to injection drug use. The controversy over the provision of sterile syringes to known or suspected IDUs to help prevent the spread of HIV and other blood-borne pathogens (e.g., hepatitis) has been discussed in the lay press and reviewed in the scientific literature. A review of the literature has shown that the provision of sterile syringes to known or suspected IDUs via needle exchange programs (NEPs) have been associated with the following: 1) a reduction in unsafe injection practices; 2) a reduction in the incidence of HIV and other blood-borne pathogen infections; 3) an increase in the safe disposal of used syringes; and 4) effective counseling and referral options for IDUs. An emerging strategy is to increase IDUs' access to sterile syringes through community pharmacies. The importance of widespread acceptance of harm reduction strategies to provide IDUs with sterile syringes is pivotal to help reduce the spread of HIV and other blood-borne pathogens among the IDU population. However, little research has been done to explain why pharmacists are willing or not willing to provide sterile syringes to known or suspected IDUs. An application of the TPB used in this study provided some understanding of this issue.

Results from this study showed that Texas community pharmacists were not willing to provide sterile syringes to known or suspected IDUs. The TPB was useful in predicting Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs. However, the perceived behavioral construct did not add to the prediction of Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs beyond attitudes and subjective norms. The recent past behavior construct was found to be influential in predicting Texas community pharmacists' willingness to provide sterile syringes to known or suspected IDUs. Texas community pharmacists with positive attitudes and a recent past history of providing sterile syringes to IDUs were significantly more likely to be willing to provide sterile syringes to IDUs. Therefore, modification strategies should target pharmacists' beliefs that affect unfavorable attitudes toward the provision of sterile syringes to known or suspected IDUs. Results indicated no gender differences among attitudes toward the provision of sterile syringes to known or suspected IDUs. Findings showed that sample characteristics did not significantly influence willingness, recent past behavior and the TPB constructs except for pharmacy policy.

This research is among the first to use a theoretical model to help predict the willingness to provide sterile syringes to known or suspected IDUs. If further research in this area can help to extend our understanding of these factors and identify other factors that explain why community pharmacists are willing or not willing to provide sterile syringes to known or suspected IDUs, then public health officials and pharmacists can use this information to better position themselves to meet the health needs and expectations of the community. As pharmacy practice continues to evolve, pharmacists must expand their knowledge base to meet the demands of the profession. With the HIV/AIDS and hepatitis epidemics on the rise among the IDU population, the pharmacy community must take a proactive approach along with public health officials and focus on issues concerning IDUs. The role of the pharmacist in IDU-related HIV and other blood-borne pathogens education and disease prevention programs within the community is becoming increasingly important in today's fight against theses epidemics.

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APPENDIX A

SURVEY BOOKLET

SURVEY BOOKLET

We are interested in factors that influence your willingness to provide sterile syringes to known or suspected intravenous drug users (IDUs). We believe that community pharmacists may play an important public health role in the provision of sterile syringes to known or suspected IDUs. Please answer the following questions to the best of your knowledge based on your experiences with your customers/clientele.

Section I. Willingness

Please circle the number that corresponds to your level of willingness with the following statement.

	Very Unlikely			**Neither Willing Nor Unwilling**			**Very Likely**
1. I am willing to provide sterile syringes to known or suspected IDUs.	-3	-2	-1	0	1	2	3

Section II. Attitudes

Next, we would like to determine your attitudes about community pharmacists providing sterile syringes to known or suspected IDUs (Questions 2-4). The list below represents possible outcomes of providing sterile syringes to known or suspected IDUs as identified by Texas community pharmacists. Please circle the number that corresponds to your choice using the scales listed below.

2. How likely do you think the following outcomes will be if you provide sterile syringes to known or suspected IDUs?

	Very Unlikely			**Neither Likely Nor Unlikely**			**Very Likely**
a. Will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis)	-3	-2	-1	0	1	2	3
b. Will increase the number of IDUs coming into my pharmacy	-3	-2	-1	0	1	2	3
c. Will provide opportunities to counsel and/or offer treatment referrals to IDUs	-3	-2	-1	0	1	2	3
d. Will encourage drug use	-3	-2	-1	0	1	2	3
e. Will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits)	-3	-2	-1	0	1	2	3
f. Will decrease the stigma associated with IDUs	-3	-2	-1	0	1	2	3
g. Will increase the accessibility of sterile syringes to IDUs, making it more convenient to obtain sterile syringes	-3	-2	-1	0	1	2	3

	Very Unlikely			Neither Likely Nor Unlikely			Very Likely
h. Will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community	-3	-2	-1	0	1	2	3
i. Will require more time from me, limiting time for other clientele	-3	-2	-1	0	1	2	3
j. Will increase safety concerns for my staff and customers/clientele	-3	-2	-1	0	1	2	3

3. Even though you may not agree with the outcomes listed, how good or bad do you feel each of the following outcomes would be if you provided sterile syringes to known or suspected IDUs?

	Very Bad			Neither Good Nor Bad			Very Good
a. Will decrease the spread of HIV and other blood-borne pathogens (e.g., hepatitis)	-3	-2	-1	0	1	2	3
b. Will increase the number of IDUs coming into my pharmacy	-3	-2	-1	0	1	2	3
c. Will provide opportunities to counsel and/or offer treatment referrals to IDUs	-3	-2	-1	0	1	2	3
d. Will encourage drug use	-3	-2	-1	0	1	2	3
e. Will decrease healthcare costs (i.e., decrease costs associated with HIV medication, hospital stays and clinic visits)	-3	-2	-1	0	1	2	3
f. Will decrease the stigma associated with IDUs	-3	-2	-1	0	1	2	3
g. Will increase the accessibility of sterile syringes to IDUs, making it more convenient to obtain sterile syringes	-3	-2	-1	0	1	2	3
h. Will increase shoplifting and other drug-related thefts and crime in my pharmacy and surrounding community	-3	-2	-1	0	1	2	3
i. Will require more time from me, limiting time for other clientele	-3	-2	-1	0	1	2	3
j. Will increase safety concerns for my staff and customers/clientele	-3	-2	-1	0	1	2	3

Next, we would like to know how you feel about providing sterile syringes to known or suspected IDUs. Please complete the following statement based on each of the following adjectives.

4. I feel that providing sterile syringes to known or suspected IDUs is:

	Very Bad			**Neither Good Nor Bad**			**Very Good**
a.	-3	-2	-1	0	1	2	3

	Very Harmful			**Neither Beneficial Nor Harmful**			**Very Beneficial**
b.	-3	-2	-1	0	1	2	3

	Very Useless			**Neither Useful Nor Useless**			**Very Useful**
c.	-3	-2	-1	0	1	2	3

	Very Foolish			**Neither Wise Nor Foolish**			**Very Wise**
d.	-3	-2	-1	0	1	2	3

	Very Worthless			**Neither Valuable Nor Worthless**			**Very Valuable**
e.	-3	-2	-1	0	1	2	3

	Very Punishing			**Neither Rewarding Nor Punishing**			**Very Rewarding**
f.	-3	-2	-1	0	1	2	3

Section III. Social Influences

Next, we are interested in what groups or individuals would influence your willingness to provide sterile syringes to known or suspected IDUs (Questions 5-7). Please circle the number that corresponds to your choice using the scales listed below.

5. How likely is it that each of the following individuals or groups would think that you should provide sterile syringes to known or suspected IDUs?

	Very Unlikely			Neither Likely Nor Unlikely			Very Likely
a. Professional Organizations (i.e., APhA, TPA)	-3	-2	-1	0	1	2	3
b. Health Organizations (i.e., CDC, HIV/AIDS advocacy groups)	-3	-2	-1	0	1	2	3
c. Regulatory Agencies/Legal Groups (i.e., TSBP, police)	-3	-2	-1	0	1	2	3
d. Community Groups	-3	-2	-1	0	1	2	3
e. Family	-3	-2	-1	0	1	2	3
f. Friends	-3	-2	-1	0	1	2	3
g. IDUs	-3	-2	-1	0	1	2	3
h. Church/Clergy	-3	-2	-1	0	1	2	3
i. Employer/Management	-3	-2	-1	0	1	2	3

6. Generally speaking, how likely are you to do what the following individuals or groups would want you to do?

	Very Unlikely			Neither Likely Nor Unlikely			Very Likely
a. Professional Organizations (i.e., APhA, TPA)	-3	-2	-1	0	1	2	3
b. Health Organizations (i.e., CDC, HIV/AIDS advocacy groups)	-3	-2	-1	0	1	2	3
c. Regulatory Agencies/Legal Groups (i.e., TSBP, police)	-3	-2	-1	0	1	2	3
d. Community Groups	-3	-2	-1	0	1	2	3
e. Family	-3	-2	-1	0	1	2	3

	Very Unlikely			Neither Likely Nor Unlikely			Very Likely
f. Friends	-3	-2	-1	0	1	2	3
g. IDUs	-3	-2	-1	0	1	2	3
h. Church/Clergy	-3	-2	-1	0	1	2	3
i. Employer/Management	-3	-2	-1	0	1	2	3

	Strongly Disagree			Neither Agree Nor Disagree			Strongly Agree
7. If I provide sterile syringes to known or suspected IDUs, most people who are important to me would approve.	-3	-2	-1	0	1	2	3

Section IV. Control Factors

Next, we are interested in what factors would make it easy or difficult for you to provide sterile syringes to known or suspected IDUs (Questions 8-11). Please circle the number that corresponds to your choice using the scales listed below.

8. Will the following make it easy or difficult for you to provide sterile syringes to known or suspected IDUs?

	Very Difficult			Neither Easy Nor Difficult			Very Easy
a. Work-related high demands of my time	-3	-2	-1	0	1	2	3
b. Support from regulatory agencies/ Change in Texas drug paraphernalia law	-3	-2	-1	0	1	2	3
c. Support from employer/Store policy	-3	-2	-1	0	1	2	3
d. Support from community	-3	-2	-1	0	1	2	3
e. Support from staff/peers	-3	-2	-1	0	1	2	3
f. Support from family	-3	-2	-1	0	1	2	3
g. Personal ethical and moral issues concerning the provision of sterile syringes to IDUs	-3	-2	-1	0	1	2	3

9. How much control do you feel you have over the following when it comes to providing sterile syringes to known or suspected IDUs?

	No Control		Neither Complete Control Nor No Control				Complete Control
a. Work-related high demands of my time	-3	-2	-1	0	1	2	3
b. Support from regulatory agencies/ Change in Texas drug paraphernalia law	-3	-2	-1	0	1	2	3
c. Support from employer/Store policy	-3	-2	-1	0	1	2	3
d. Support from community	-3	-2	-1	0	1	2	3
e. Support from staff/peers	-3	-2	-1	0	1	2	3
f. Support from family	-3	-2	-1	0	1	2	3
g. Personal ethical and moral issues concerning the provision of sterile syringes to IDUs	-3	-2	-1	0	1	2	3

Next, we would like you to answer the following two statements in a general sense (Questions 10-11). Please circle the number that corresponds to your choice using the scale listed below.

	Strongly Disagree		Neither Agree Nor Disagree				Strongly Agree
10. For me to provide sterile syringes to known or suspected IDUs would be easy.	-3	-2	-1	0	1	2	3
11. I have complete control over whether or not I will provide sterile syringes to known or suspected IDUs.	-3	-2	-1	0	1	2	3

Section V. Past Behavior

Next, we would like to know about your past behavior regarding the provision of sterile syringes to known or suspected IDUs (Question 12). Please circle the number that corresponds to your choice using the scale listed below.

	Never		Sometimes				Always
12. How often did you provide sterile syringe(s) to a known or suspected IDU in the last three months?	-3	-2	-1	0	1	2	3

Section VI. Demographic/Practice Characteristics

Now, we would like to know a little about you and your practice setting so that we can better understand your responses (Questions 13-24). Please check the appropriate item or write in your responses where appropriate.

13. What is your gender?

____(1) Male
____(2) Female

14. In what year were you born? 19_____

15. Which of the following best describes your ethnic/racial background?

____(1) African-American/Black
____(2) American Indian or Alaskan Native
____(3) Asian-American/Oriental
____(4) Caucasian-American/White
____(5) Mexican-American or Other Hispanic Origin
____(6) Other (please specify)_________________________

16. How many years have you been practicing pharmacy? _____years

17. What is your current job title at your primary place of employment?

____(1) Pharmacy Owner / Partner
____(2) Pharmacy Manager
____(3) Staff Pharmacist
____(4) Relief Pharmacist
____(5) Other (please specify)_________________________

18. Please indicate your type of practice setting at your primary place of employment.

____(1) Community – independent
____(2) Community – chain
____(3) Community – clinic
____(4) Other (please specify)__________________________

19. Which of the following best describes the area/setting of your primary place of employment?

____(1) Urban
____(2) Suburban
____(3) Rural

20. On average, how many hours per week do you work at your primary place of employment?

_____hours/week

21. On average, how many hours per week do you dispense medication and/or interact with patients at your primary place of employment?

_____hours/week

Screening Procedures

22. What is your general procedure for screening customers when selling syringes? (Please check all that apply)

____(1) Do not screen customers
____(2) Require Diabetic Information
____(3) Require Picture ID
____(4) Require Name/Address
____(5) Consider time of day
____(6) Ask customer why they want them
____(7) Consider familiarity with customer
____(8) Other (please specify)____________________________________

Determination of a Known or Suspected Intravenous Drug User

23. Please describe below in your own words how you suspect or know an individual is an IDU.

____
____
____
____
____

Policy Knowledge

24. Are you aware of an official/unofficial policy regarding the provision of sterile syringes to known or suspected IDUs at your pharmacy?

____(1) No
____(2) Yes → If "Yes," please indicate your pharmacy's official/unofficial policy regarding the provision of sterile syringes to known or suspected IDUs.

____(a) Supports the provision of sterile syringes to IDUs
____(b) Does **NOT** support the provision of sterile syringes to IDUs

Please indicate whether your pharmacy's policy is official or unofficial:

____(a) Official
____(b) Unofficial
____(c) Don't Know

***If you would like to receive an aggregate summary of the results of this study once it is completed, please email Jay H. Mashburn at jhackburn@yahoo.com or send a postcard to the following address: Jay H. Mashburn, College of Pharmacy – Mail Code A1930, University of Texas at Austin, Austin, Texas 78712.

THANK YOU FOR YOUR PARTICIPATION!

Please fold the questionnaire with the business reply on the outside. Secure it with tape and drop it in any mailbox. No postage is necessary.

APPENDIX B

COVER LETTER

November 6, 2001

Dear Pharmacist Colleague,

The number of AIDS cases attributed to injection drug use has increased steadily over the past decade. Injection drug users (IDUs) are at greatest risk for HIV and other blood pathogens (e.g., hepatitis) infections when they share contaminated syringes and other drug injection equipment. However, the risk of HIV infection is not limited to IDUs but also exists for the non-injecting community (IDUs' sexual partners and offspring). One emerging strategy in the United States and the World is to increase IDUs' access to sterile syringes through community pharmacies. Therefore, we would like to obtain your attitudes and opinions about your willingness to provide sterile syringes to known or suspected IDUs.

Enclosed is a survey, which has been designed to elicit your opinions and your willingness to provide sterile syringes to IDUs. We have sent this questionnaire to a random sample of 500 community pharmacists in the state of Texas. This sample list was generated from the Texas State Board of Pharmacy database. Because you are one of a small group of people randomly selected for this study, we hope you will participate so that our results will be representative of Texas community pharmacists. Your decision to participate or not to participate will not affect your present or future relationship with The University of Texas at Austin. Although participation is voluntary, we feel it is important that you make yourself heard on an issue that may likely affect your practice.

It will take approximately 13 minutes of your time to complete the questionnaire. All responses will be anonymous and confidential. Only aggregate responses can be reported and results can in no way be linked to you. We request that you complete this postage-paid survey and return it to us as soon as possible. You do not have to answer every question if you do not wish. Completing the mail survey will serve as your consent to participate in the study. After completing the survey, please fold it with the business reply on the outside, secure it with tape, and mail it back to us by **November 21, 2001**. No postage is necessary.

This research is being conducted as partial fulfillment of the requirements for a dissertation. Your cooperation is truly appreciated. If you have any questions, please do not hesitate to contact Jay Mashburn (972) 317-0016 or Dr. Brown at (512) 471-2374.

Thank you for your time and assistance in participating in this important study.

Sincerely,

Jay H. Mashburn, R.Ph., M.S.
Doctoral Candidate

Carolyn M. Brown, R.Ph., Ph.D.
Associate Professor and
Dissertation Advisor

APPENDIX C

REVISED COVER LETTER

November 28, 2001

Dear Pharmacist Colleague,

Three weeks ago, a questionnaire seeking your opinions about your willingness to provide sterile syringes to intravenous drug users (IDUs) was mailed to you. As stated in the first cover letter, the number of AIDS cases attributed to injection drug use has increased steadily over the past decade. IDUs are at greatest risk for HIV and other blood pathogens (e.g., hepatitis) infections when they share contaminated syringes and other drug injection equipment. One emerging strategy in the United States and the World is to increase IDUs' access to sterile syringes through community pharmacies. Therefore, we would like to obtain your attitudes and opinions about your willingness to provide sterile syringes to known or suspected intravenous drug users.

Enclosed is a survey, which has been designed to elicit your opinions and your willingness to provide sterile syringes to IDUs. We have sent this questionnaire to a random sample of 500 community pharmacists in the state of Texas. This sample list was generated from the Texas Sate Board of Pharmacy database. Because you are one of a small group of people randomly selected for this study, we hope you will participate so that our results will be representative of Texas Community pharmacists. Your decision to participate or not to participate will not affect your relationship with The University of Texas at Austin. Although participation is voluntary, we feel it is important that you make yourself heard on an issue that my likely affect your practice.

It will only take approximately 13 minutes of your time to complete the questionnaire. All responses will be anonymous and confidential. Only aggregate responses can be reported and results can in no way be linked to you. We request that you complete this postage-paid survey and return it to us as soon as possible. You do not have to answer every question if you do not wish. Completing the mail survey will serve as your consent to participate in the study. After completing the survey, pleas fold it with the business reply on the outside, secure it with tape, and mail it back to us by **December 19, 2001**. No postage is necessary.

If you have already completed and returned the survey to us, please accept our sincere thanks. If not, please do so today. This research is being conducted as partial fulfillment of the requirements for a dissertation. If you have any questions, please do not hesitate to contact Jay Mashburn (972) 317-0016 or Dr. Brown at (512) 471-2374.

Thank you for your time and assistance in participating in this important study.

Sincerely,

Jay H. Mashburn, R.Ph., M.S.
Doctoral Candidate

Carolyn M. Brown, R.Ph., Ph.D.
Associate Professor and
Dissertation Advisor

APPENDIX D

FOCUS GROUP FORMAT

Focus Group Format

Introduction

My name is Jay Mashburn and I will be your moderator for this focus group session. The purpose of this focus group session is to get your perceptions, experiences, and feelings regarding the provision of sterile syringes to known or suspected intravenous drug users (IDUs). The information obtained from this focus group session will be used to develop a survey that will be administered to a larger group of Texas community pharmacists.

This session will be audio (tape) recorded. However, no names will be used for any portion of the larger study. Information obtained from this focus group session will not be associated with any specific focus group participant. The purpose of the audio recordings during the focus group session is to ensure that nothing (important information) is missed when constructing the final survey instrument. The audio tapes will be stored in a locked file cabinet and will be used only by research personnel. This session is expected to last one to two hours and you have the right to stop participating at any time.

Group Rules

As the moderator, I will ask the questions and keep everyone on track. I will keep track of time, and therefore, I may need to interrupt the discussion and move forward if I see we are getting short on time. It is important that everyone feels comfortable and easy going during the discussion. There are no right and wrong answers. Everyone's input is vital. I encourage you to speak freely and openly about the issues discussed during this session.

General Questions

1. Briefly tell me what you think about when you think of the provision of sterile syringes to known or suspected IDUs.

2. What comes to mind when your hear "Are you willing to provide sterile syringes to known or suspected IDUs. How does this question differ from "How likely are you to provide sterile syringes to known or suspected IDUs" and "Do you intend to provide sterile syringes to known or suspected IDUs?"

Key Questions

1. What do you think are some of the advantages associated with community pharmacists providing sterile syringes to known or suspected IDUs?

2. What do you think are some of the disadvantages associated with community pharmacists providing sterile syringes to known or suspected IDUs?

3. Are there any other advantages and disadvantages associated with community pharmacists providing sterile syringes to known or suspected IDUs?

4. Are there any individuals or groups who would approve of community pharmacists providing sterile syringes to known or suspected IDUs?

5. Are there any individuals or groups who would not approve community pharmacists providing sterile syringes to known or suspected IDUs?

6. Are there any other individuals or groups who would or would not approve community pharmacists providing sterile syringes to known or suspected IDUs?

7. What do you think would make it easier to provide sterile syringes to known or suspected IDUs?

8. What do you think would make it difficult to provide sterile syringes to known or suspected IDUs?

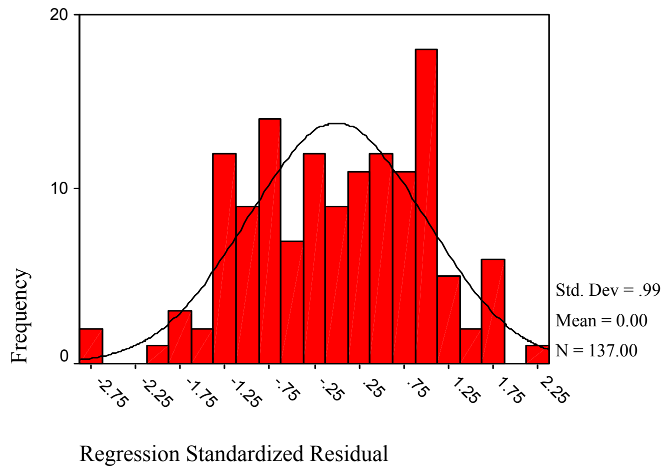
9. The purpose of this focus groups session was to find out how you feel about the provision of sterile syringes to known or suspected IDUs. We wanted to get a feel for your perceptions of the advantages, disadvantages of the provision of sterile syringes to IDUs and to also a feel for those who might be important to you in making a decision regarding the provision of sterile syringes to IDUs. Is there anything else we should have discussed that we did not discuss?

APPENDIX E

HISTOGRAMS OF RESIDUALS FROM REGRESSION ANALYSIS

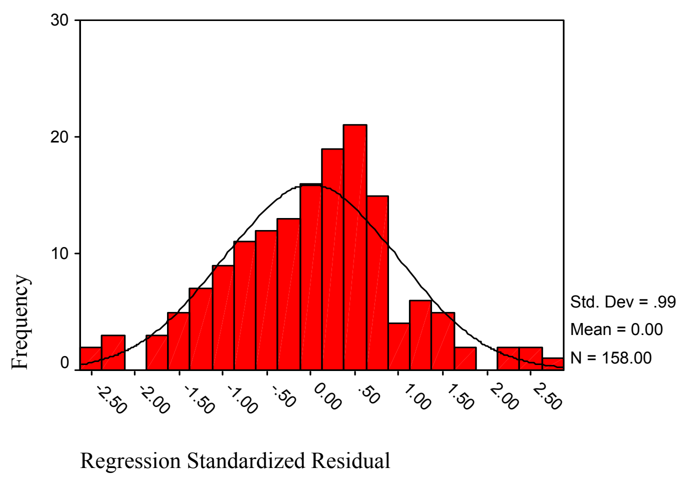
Histogram of Residuals from Regression

of Belief-Based TPB Constructs



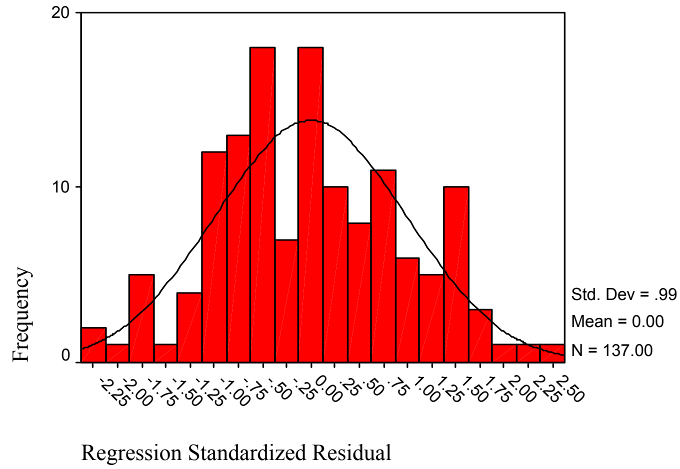
Histogram of Residuals from Regression

of Direct Measure TPB Constructs



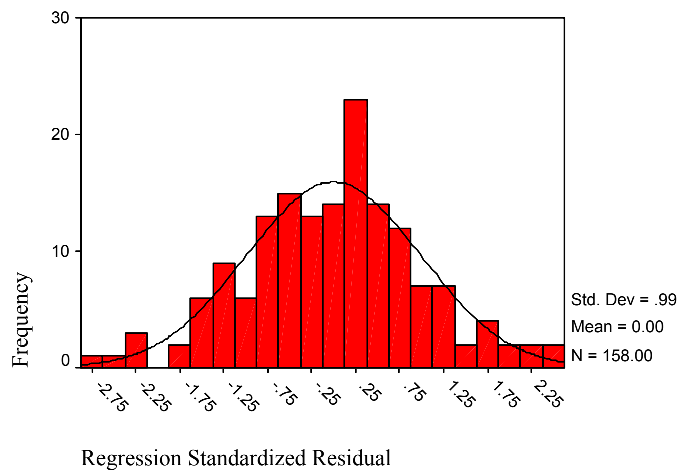
Histogram of Residuals from Regression

of Belief-Based TPB Constructs and Past Behavior



Histogram of Residuals from Regression

Direct Measure TPB Constructs and Past Behavior

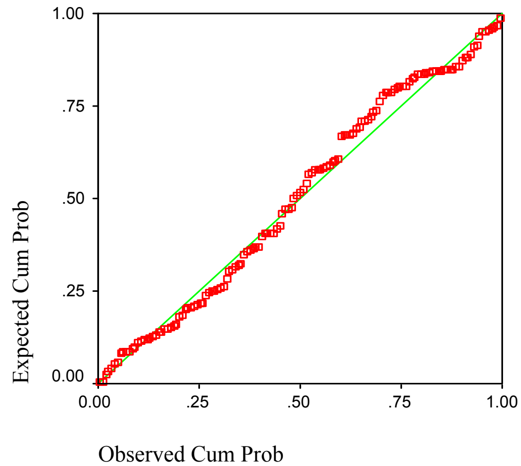


APPENDIX F

NORMAL P-PLOTS

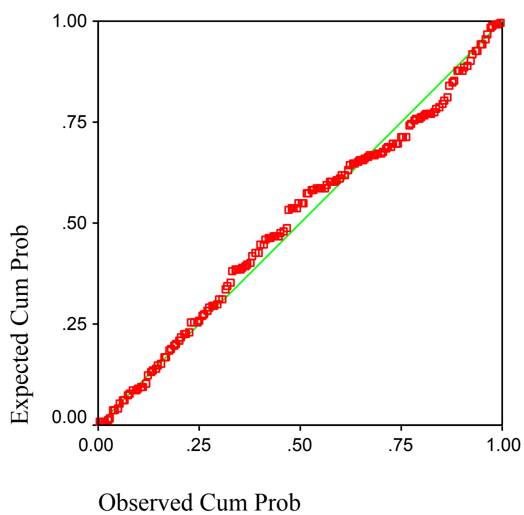
Normal P-P Plot of Regression Standardized Residual

from Belief-Based TPB Constructs



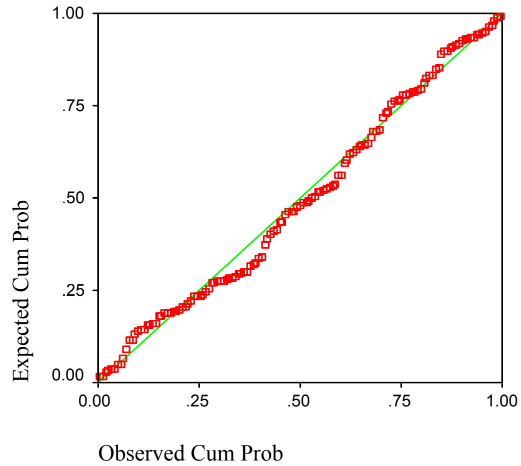
Normal P-P Plot of Regression Standardized Residual

from Direct Measure TPB Constructs



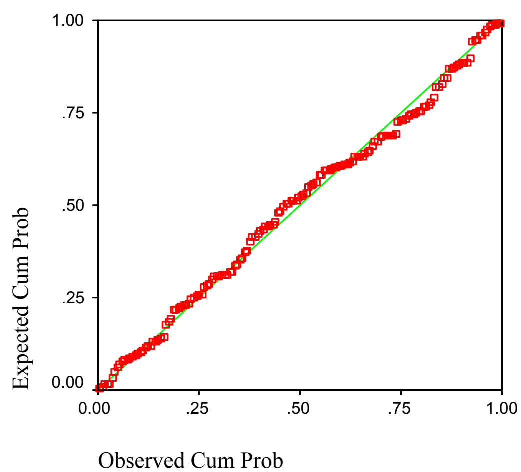
Normal P-P Plot of Regression Standardized Residual from

Belief-Based TPB Constructs and Past Behavior



Normal P-P Plot of Regression Standardized Residual from

Direct Measure TPB Constructs and Past Behavior

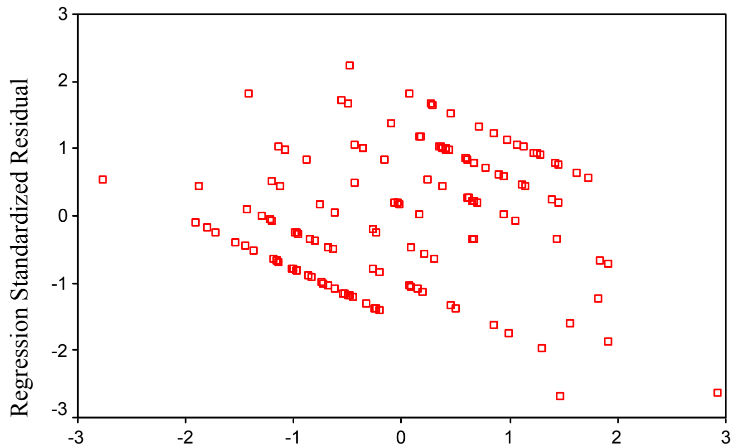


APPENDIX G

SCATTER PLOTS OF RESIDUALS

Scatterplot of Residuals from Regression

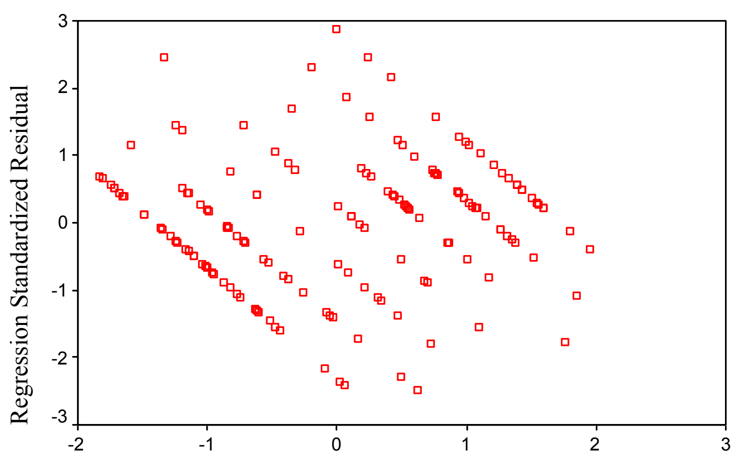
of Belief-Based TPB Constructs



Regression Standardized Predicted Value

Scatterplot of Residuals from Regression

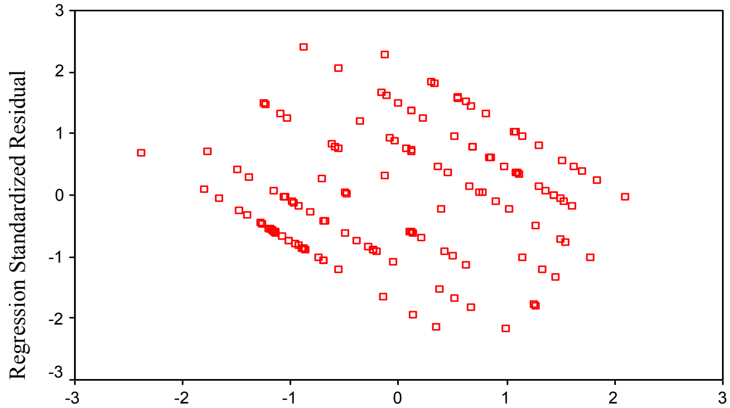
of Direct Measure TPB Constructs



Regression Standardized Predicted Value

Scatterplot of Residuals from Regression

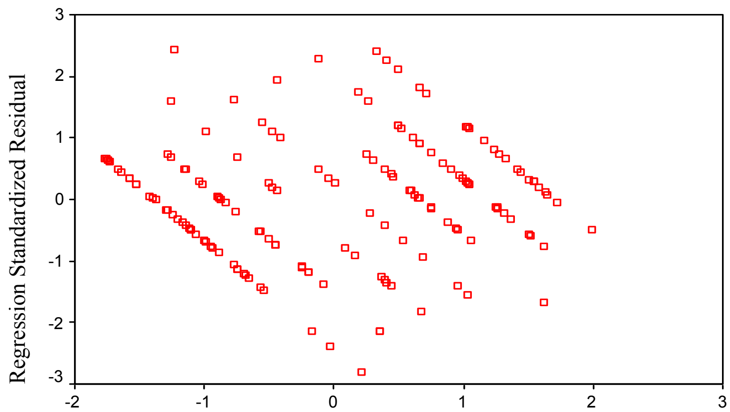
of Belief-Based TPB Constructs and Past Behavior



Regression Standardized Predicted Value

Scatterplot of Residuals from Regression

of Direct Measure TPB Constructs and Past Behavior



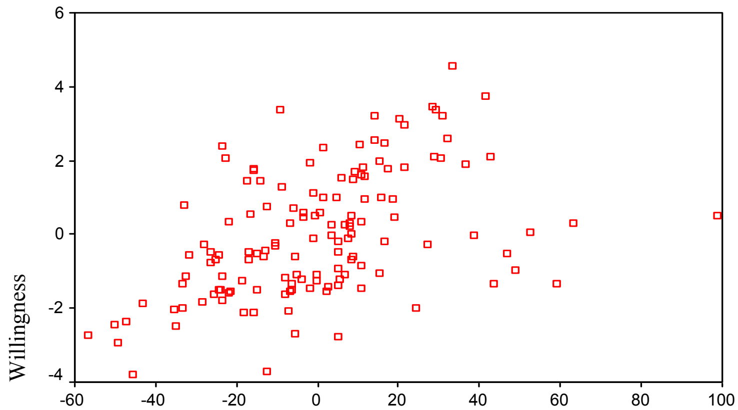
Regression Standardized Predicted Value

APPENDIX H

PARTIAL REGRESSION PLOTS

Partial Regression Plot

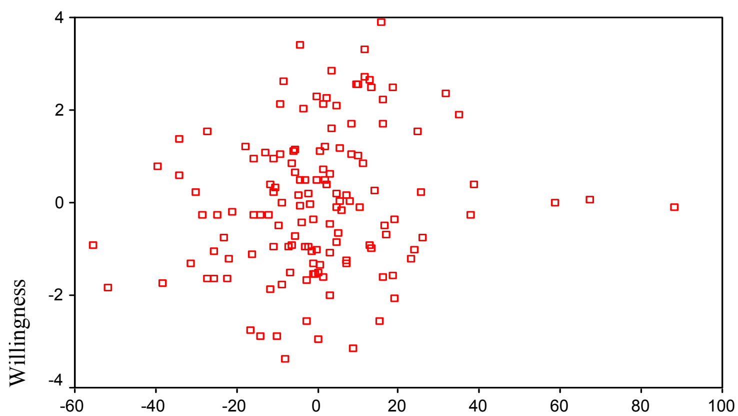
Dependent Variable: Willingness



BBATT

Partial Regression Plot

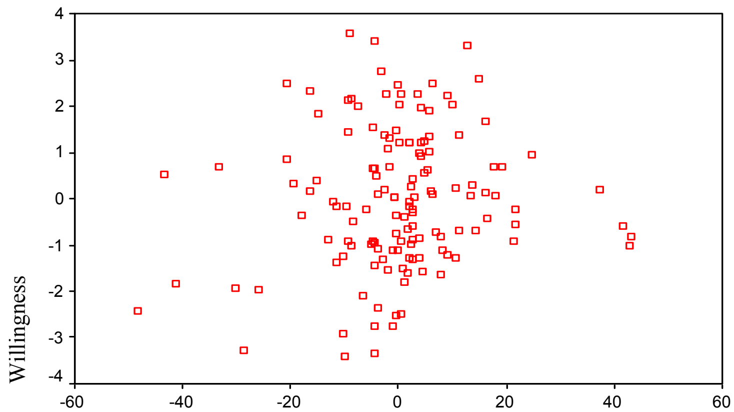
Dependent Variable: Willingness



BBSN

Partial Regression Plot

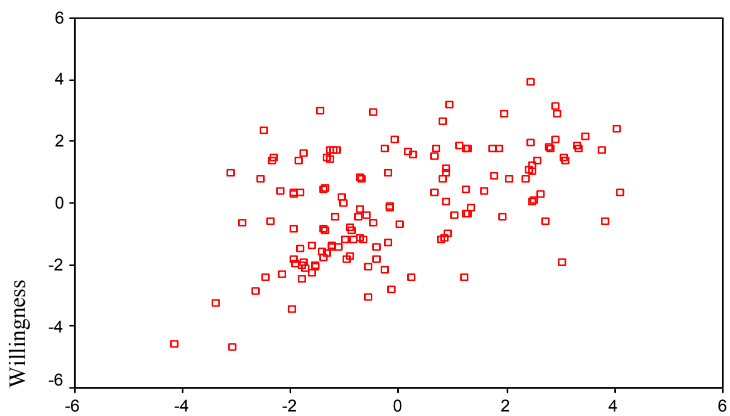
Dependent Variable: Willingness



BBPBC

Partial Regression Plot

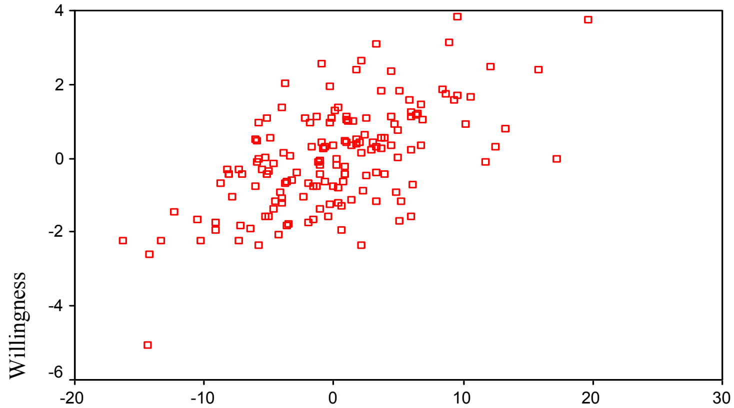
Dependent Variable: Willingness



Past Behavior

Partial Regression Plot

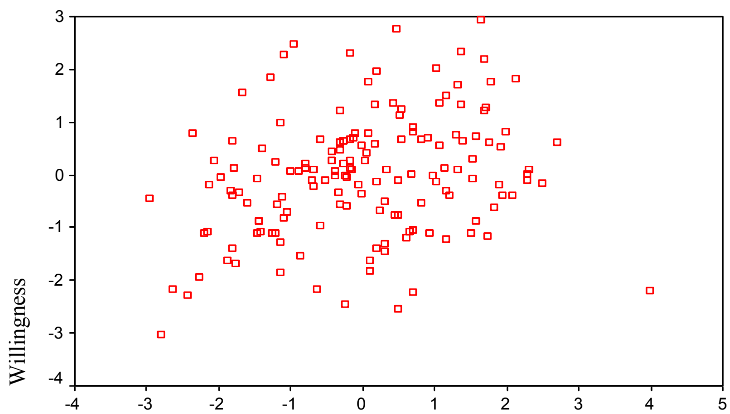
Dependent Variable: Willingness



DIRATT

Partial Regression Plot

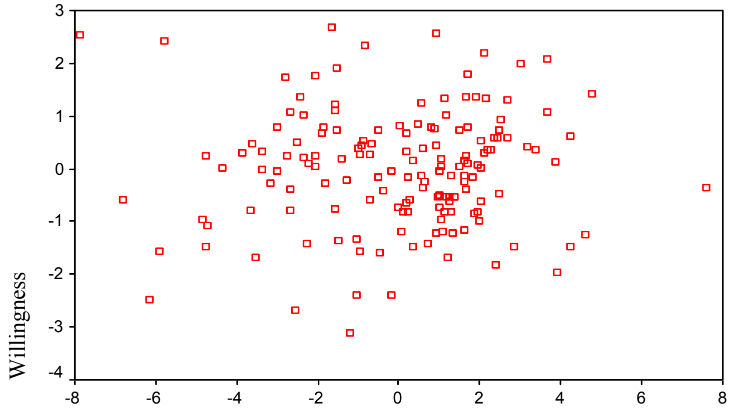
Dependent Variable: Willingness



SN Direct

Partial Regression Plot

Dependent Variable: Willingness



DIRPBC

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