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Marc L. Fleming

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USING THE THEORY OF PLANNED BEHAVIOR TO EXAMINE TEXAS COMMUNITY PHARMACISTS' INTENTIONS TO UTILIZE A PRESCRIPTION DRUG MONITORING PROGRAM

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by

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Dedication

This is dedicated to Stacey, my wife of 12 years and my daughter Leah. I love you both more than words can express. This is also dedicated to my parents, family and closest friends; thanks for believing in me.

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USING THE THEORY OF PLANNED BEHAVIOR TO EXAMINE TEXAS COMMUNITY PHARMACISTS' INTENTIONS TO UTILIZE A PRESCRIPTION DRUG MONITORING PROGRAM

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The University of Texas at Austin, 2012

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The purpose of this study was to determine the predictive utility of the theory of planned behavior (TPB) in predicting and explaining pharmacists' intention to utilize a prescription drug monitoring program (PDMP) database, when the validity of the prescription/patient need is in question. The study tested the significance of each TPB model construct variable (attitude [A], subjective norm [SN], and perceived behavioral control [PBC]) in predicting pharmacists' high intention, compared to non-high intention (dichotomous variable). In addition, the study examined the additional contribution of pharmacists' perception of prescription (PPDA) drug abuse and perceived obligation (PO) to the TPB model. Demographic and practice characteristics were also explored in relation to the TPB model predictors, A, SN and PBC.

A mail questionnaire was sent to a random sample of 998 Texas community pharmacists with active licenses. Three focus groups were conducted to collect information regarding pharmacists' beliefs toward PDMP database utilization. The

usable survey response rate was 26.2%. Due to data that were not normally distributed, intention was dichotomized into high intention and non-high intention. The TPB constructs were significant predictors of pharmacists' high intention. Pharmacists with positive attitudes were almost twice as likely to have high intention (odds ratio [OR] = 1.8, 95% confidence interval [CI] = 1.2 – 2.8). However, SN was the strongest predictor of pharmacists' high intention (OR = 2.2, 95% CI = 1.4 – 3.3). Pharmacists who reported substantial PBC were also twice as likely to have high intention (OR = 1.9, 95% CI = 1.2 – 3.0). PPDA was not significantly related to pharmacists' high intention. However, pharmacists' PO was shown to predict high intention above that explained by the TPB model (OR = 1.8, 95% CI = 1.0 – 3.1).

The results of this study support the utility of the TPB model with PO in predicting pharmacists' high intention to utilize a PDMP database. Interventions that address pharmacists' A, SN, PBC, and PO may be necessary to increase pharmacists' high intention to utilize a PDMP database when it becomes available. Future studies using intention as a predictor of pharmacists' behavior are needed to assess the influence of intention on PDMP utilization.

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CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

Prescription drug abuse is an established epidemic at this time. The Drug Abuse Warning Network (DAWN) reported that prescription drug abuse and misuse involving pharmaceuticals accounted for almost one million emergency department visits in 2008 (Substance Abuse and Mental Health Services Administration Center for Behavioral Health Statistics and Quality, 2011). To combat the growing epidemic of prescription drug abuse, many states have implemented prescription drug monitoring programs (PDMPs) (Joranson, Carrow, et al., 2002; Katz et al., 2008; Manchikanti, Brown, & Singh, 2002). Currently, there are 41 states with active PDMPs (Alliance of States with Prescription Monitoring Programs, 2012). As opposed to past prescription monitoring (e.g., triplicate prescription forms), contemporary PDMPs allow healthcare providers (e.g., pharmacists) to perform drug utilization reviews (DURs) of patients' controlled substance medication history dispensed from community pharmacies in their respective states. DURs performed by pharmacists can be used to determine the appropriateness of dispensing controlled prescription drugs (CPDs) to patients. Therefore, pharmacists can improve morbidity and mortality rates associated with misuse of CPDs. Furthermore, law enforcement officials and politicians have purported that PDMPs are one solution for decreasing diversion and misuse of prescription drugs.

The primary issue with respect to health care providers and prescription drug abuse is balancing the availability of necessary prescription medications, in particular opioid analgesics for pain management, without contributing to misuse and diversion of

CPDs (Fishman et al., 2004; Manchikanti, Whitfield, & Pallone, 2005; Simoni-Wastila & Tompkins, 2001). Many states have adopted practice guidelines for the use of opioid analgesics in order to responsibly treat patients suffering with pain (Joranson, Gilson, et al., 2002). However, in one case, a physician was found liable and was forced to pay retribution to a patients' family for not providing adequate pain management medications (Fleming, 2002). Additionally, pain management proponents and advocacy groups have highlighted issues related to inadequate pain treatment in both cancer and non-malignant pain (Joranson, Carrow, et al., 2002). Physicians are often conflicted between adequately treating a patients' pain and prescribing opioid analgesics that have the potential to be abused (American Pain Society, 2008; Nwokeji et al., 2007).

Due to the increased number of prescriptions written for many opioid analgesics and other CPDs, the street demand and diversion of these medications has been on the rise (Bollinger et al., 2005). Historically, a greater supply of CPDs has been associated with higher abuse rates, due to the increased availability of the drugs (e.g., methaqualone during the 1980's). Diversion has been defined as the illegal removal of pharmaceuticals from a pharmacy or supply chain (Tommasello, 2004). One common method of diversion is known as "doctor shopping." This occurs when patients seek out many different physicians for the purpose of obtaining CPDs (Inciardi et al., 2009). Some patients may doctor shop to satisfy their own addiction or for the purposes of selling the medications for illicit use (Inciardi et al., 2009). Some doctors are also unethically capitalizing on the demand for CPDs by operating clinics that provide opioids and other CPDs to patients in exchange for cash, illicit drugs and sex (Drug Enforcement Administration, 2007; Jung & Reidenberg, 2006).

In addition to the aforementioned issues, another concern regarding prescription drug abuse is that there has been a prominent increase among teenagers and young adults, from 1995 to 2005 (McCabe, Teter, & Boyd, 2004; Office of National Drug Control Policy, 2007). Stimulants such as Ritalin® and Adderall® have become common drugs used among high school and college students (McCabe & Boyd, 2005; McCabe, Teter, & Boyd, 2004). In a survey among high school students, the results showed that hydrocodone/acetaminophen (Vicodin®) was easier to obtain than beer (Office of National Drug Control Policy, 2007). Students reported that friends and family are very often the source by which they obtain prescription drugs for misuse (Substance Abuse and Mental Health Services Administration, 2006b). When asked about reasons related to misuse of pain medications, almost 70 percent cited ease of accessibility from their parents' medicine cabinets (The Partnership for a Drug-Free America, 2006).

The increase in misuse of CPDs has been associated with an increase in accidental overdose deaths, which are now higher than for illicit drugs such as heroin and marijuana (Substance Abuse and Mental Health Services Administration, 2008). Pharmacists can have a vital role in decreasing prescription drug abuse by providing education to patients on side effects and the appropriate use of CPDs (Cooper, 1993). Pharmacists can prevent diversion by verifying prescriptions for legitimacy with the prescribers and querying PDMP patient histories prior to dispensing. Furthermore, the American Society of Health-System Pharmacists (ASHP) advocates that pharmacists are in a position to impact patients with regard to prescription drug abuse by offering counseling and or referral to those in need of assistance (ASHP, 2003).

Based on data from the National Center for Health Statistics, the number of deaths involving prescription opioids is a considerable problem. National data on prescription drug misuse shows that in 2009, 7 million (2.8%) of the population aged 12 and older abused prescription drugs (Substance Abuse and Mental Health Services Administration, 2010). Prescription opioids were involved in 13,800 deaths in 2006 (Warner, Chen, & Makuc, 2009). In the Appalachian Mountain regions of Kentucky and West Virginia, prescription drug abuse and diversion have reached disproportionately high levels, compared to national statistics (Cicero, Inciardi, & Munoz, 2005; Manchikanti, 2006). In Kentucky, this led to the development and enactment of the Kentucky All Schedule Prescription Electronic Reporting (KASPER) (Kentucky All Schedule Prescription Electronic Reporting [KASPER], 2006). By law, the KASPER Act mandates that all scheduled prescription medications dispensed in the state of Kentucky, at the community pharmacy level, must be reported to the state database. Data included in this record are the patient's name, prescriber's name and DEA number, the dispensing pharmacy, name of medication, quantity of medication and date of dispensing.

In 2005, the federal government adopted a similar measure, to create a nationwide database, with the passage of the aptly named National All Schedule Prescription Electronic Reporting (NASPER) Act (Manchikanti, Whitfield, & Pallone, 2005). However, before 2009, NASPER had not received funding, and in lieu of funding, the Harold Rogers Program has served as the primary federal funding source for states to create and maintain their own databases of CPDs (Bureau of Justice Assistance, 2009). Many states (n = 41) have implemented electronic versions of PDMPs to curtail the diversion and abuse of CPDs (Alliance of States with Prescription Monitoring Programs,

2012; United States General Accounting Office, 2002). PDMPs in one form or another have been used for decades (e.g., multiple copy prescription programs [MCPPs]) (Joranson, Carrow, et al., 2002). However, with the increased accessibility to data afforded by the internet, most contemporary monitoring programs' data are available online to pharmacists and physicians (Alliance of States with Prescription Monitoring Programs, 1999; Fishman, et al., 2004). As technology advances, electronic databases will assist health care providers and state law enforcement agencies in fighting prescription drug misuse and diversion.

The State of Texas adopted (September 2008) legislation which requires pharmacies to report dispensing information on scheduled (C-II to C-V) CPDs dispensed from community pharmacies. Table 1.1 includes a description of the federal controlled substance schedules and examples of CPDs (Drug Enforcement Administration, 2008b; Fujimoto, 2001).

Table 1.1 Description and examples of federal controlled substance schedules

	Description of Criteria	Examples
Schedule I (C-I)	High abuse potential, lack of accepted safety; no current medical use	Heroin, lysergic acid (LSD), marijuana, 3,4- methylene-dioxymethamphetamine (MDMA or "Ecstasy")
Schedule II (C-II)	High potential for abuse; severe psychological or physical dependence liability; accepted medical use	Morphine, codeine and opium, methadone, methylphenidate (stimulant) (e.g., Ritalin®)
Schedule III (C-III)	Moderate or low physical dependence or high psychological dependence; accepted medical use	Hydrocodone (less than 15 mg) combined with acetaminophen or ibuprofen (e.g. Vicodin®), Codeine w/ acetaminophen, anabolic steroids, buprenorphine
Schedule IV (C-IV)	Less potential for abuse than C-III; accepted medical use	Benzodiazepines (e.g., alprazolam (Xanax®), temazepam, chloral hydrate, phentermine, phenobarbital
Schedule V (C-V)	Low abuse potential; limited physical dependence or psychological dependence relative to C-IV; accepted medical use	Proemthazine w/ codeine, diphenoxylate w/ atropine, and guaifenesin w/ codeine (e.g., Robitussin AC®)

Compiled from: The DEA's Pharmacist Manual and Fujimoto (2001).

Many federal and state resources have been allocated for PDMPs; however, there is inconclusive evidence regarding the effectiveness of such monitoring programs in preventing diversion or decreasing abuse and misuse (American Society of Interventional Pain Physicians [ASIPP], 2009; Bureau of Justice Assistance, 2009). Texas has received funding from the Harold Rogers Federal Grant Program for monitoring all scheduled prescription drugs (Bureau of Justice Assistance, 2009).

1.2 STUDY PURPOSE

The purpose of this study is to test the predictive utility of the theory of planned behavior (TPB) in understanding Texas community pharmacists' intention to utilize an online prescription database as an aid in their decision making process when dispensing

controlled substance medications, where the validity of the prescription, patient-doctor relationship or patient needs may be in doubt. The study will also examine the factors (attitude, subjective norm, and perceived behavioral control) associated with Texas pharmacists' intention to utilize PDMP data.

1.3 STUDY SIGNIFICANCE

The study is significant for several reasons. Identification of socio-cognitive factors associated with pharmacists' intention to utilize a PDMP could prove valuable in the development of interventions targeted at increasing utilization (Ajzen, 2011). Prescription drug abuse and misuse have become a burden on the health care system and financial resources, with estimated health care costs of approximately $25 billion per year in 2007 (Birnbaum et al., 2006). Pharmacists play a key role in ensuring that medications are used appropriately by patients and that physicians are prescribing medication in a manner that is medically appropriate for each patient (Brushwood, 2001). Additionally, pharmacists serve as gatekeepers of the medication supply available to the general public (Vivian, 1994). Therefore, it is important to ascertain information regarding how pharmacists view the usage of an online PDMP database in their decision making process when dispensing CPDs.

If PDMPs are to be successful in preventing diversion and doctor shopping, pharmacists must be willing to access the database to obtain information on patient CPD history prior to dispensing. Drug utilization review (DUR) through PDMPs will assist pharmacists in balancing access to CPDs (e.g., opioids) against the current epidemic of prescription drug abuse. Currently, there are no known empirical studies which have

examined the extent to which practitioners intend to utilize these databases when making care decisions.

In Texas, documentation of all CPDs dispensed has created an additional administrative burden for pharmacists (Texas Department of Public Safety (DPS), 2008; Wang, 2009). Although the data in most cases is transmitted electronically, any errors in order entry of physician Drug Enforcement Administration (DEA) number or Department of Public Safety (DPS) number must be corrected and resubmitted on a monthly basis (Texas Department of Public Safety, 2008). The DPS number is issued to Texas prescribers as part of their controlled substance registration application, and serves as an electronic identifier when pharmacies transmit prescription information to the DPS vendor for all CPDs dispensed from community pharmacies (Texas Department of Public Safety, 2008). When submitting data to the DPS, the following information must be documented:

1. Pharmacy DPS number, (number issued by DPS)
2. Prescription number assigned by the pharmacy
3. National drug code (NDC) of medication
4. Date prescription filled
5. Date prescription written
6. Metric quantity
7. Prescription control number (for schedule II only)
8. Prescriber DPS number
9. Patient first name
10. Patient last name

11. Patient street address
12. Patient state
13. Patient zip code
14. Patient date of birth or age

Considering the additional administrative burden of reporting dispensing information of all scheduled medications in Texas, pharmacists may be reluctant to use the program data. It is important to provide the State Board of Pharmacy and law enforcement officials with the appropriate recommendations, derived from pharmacists' attitude, subjective norm and perceived behavioral control regarding the implementation of the online prescription database.

At the conclusion of this research, it is our expectation that we will be able to make recommendations to the State Board of Pharmacy in Texas and Boards of Pharmacy in other states regarding pharmacists' socio-cognitive behavioral factors (attitude, subjective norm and perceived behavioral control) related to PDMPs. Ultimately, we hope that the results of this study will enhance PDMPs utilization among pharmacists and decrease prescription drug misuse, while facilitating patients' access to medically necessary CPDs.

CHAPTER TWO: LITERATURE REVIEW

2.1 EPIDEMIOLOGY OF PRESCRIPTION DRUG ABUSE

Prescription drug abuse and misuse have been characterized in the literature as the non-medical use of prescription drugs (Becker et al., 2008; Wu et al., 2007). The term non-medical use is most often defined as taking a prescription medication without a prescription from your doctor or taking a prescription medication solely for the "feeling they cause" (Substance Abuse and Mental Health Services Administration, 2009a). Yet, the Drug Abuse Warning Network (DAWN) describes non-medical use of pharmaceuticals as taking more than prescribed, taking someone else's medication, and combining pharmaceuticals with illicit drugs or alcohol (Substance Abuse and Mental Health Services Administration, 2006a). DAWN is a surveillance unit of the Substance Abuse and Mental Health Services Administration that records emergency department visits that are related to drug abuse or misuse (The Substance Abuse and Mental Health Services Administration 2009). Prescription drug abuse has been steadily increasing for the past 20 years and it is now recognized as a national epidemic; especially alarming is the increase in abuse among teenagers and young adults (Bollinger, et al., 2005). Another concern is the increase in the number of deaths related to prescription medication misuse, which has been highlighted by the recent deaths of numerous celebrity figures, such as Michael Jackson, Heath Ledger and Anna Nicole Smith (Burke, 2009; Kluger, 2010).

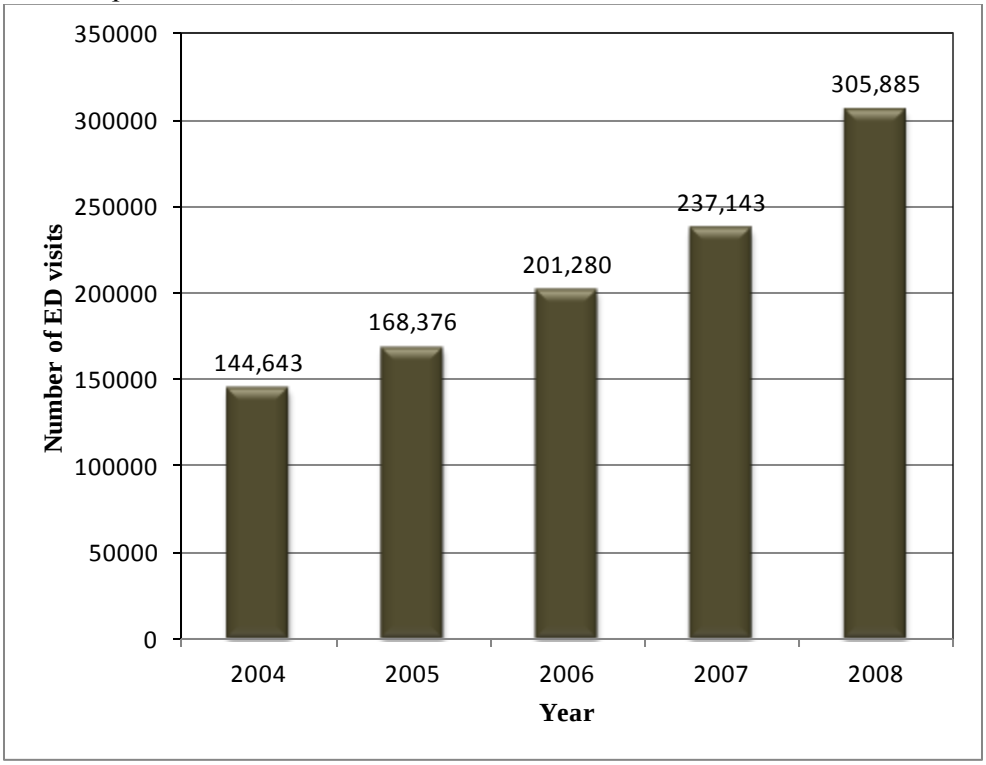
2.2 ASSOCIATED MORBIDITY OF PRESCRIPTION DRUG ABUSE

The misuse of controlled prescription drugs (CPDs) can lead to unwanted effects that require medical attention. The Drug Abuse Warning Network (DAWN) reports show that from 1995 to 2002, there was a significant increase in the number of emergency department (ED) visits associated with prescription drug involvement (Substance Abuse and Mental Health Services Administration, 2003). From 1995 to 2002, narcotic (i.e., opioid) analgesics involved in ED visits increased 163 percent (45,254 to 119,185) (Substance Abuse and Mental Health Services Administration, 2003). In the year 2004, DAWN estimated that 500,000 ED visits were related to prescription drug misuse (Substance Abuse and Mental Health Services Administration, 2006a). According to DAWN, ED visits that are associated with drug abuse or misuse increased 21 percent from 2004 to 2005 (Substance Abuse and Mental Health Services Administration, 2007). In addition, DAWN estimated that in 2005, approximately 600,000 ED visits were the result of the misuse of prescription and over-the-counter medications (Substance Abuse and Mental Health Services Administration, 2007).

Hydrocodone/acetaminophen and oxycodone accounted for 51,225 and 42,810 of ED visits, respectively in 2005 (Substance Abuse and Mental Health Services Administration, 2007). Methadone accounted for an additional 41,216 in ED visits related to improper use of prescription medication (Substance Abuse and Mental Health Services Administration, 2007). Misuse and abuse of prescription and over-the-counter drugs also accounted for 741,425 ED visits in 2006 (Substance Abuse and Mental Health Services Administration, 2008). The trend in ED visits

from 2004 to 2008 continued to escalate with respect to opioid analgesics (See Figure 2.1). A 111 percent increase was observed between the aforementioned years (144,644 to 305,885) (Centers for Disease Control and Prevention, 2010).

Figure 2.1 DAWN National Estimates of Drug-Related (Controlled Prescriptions) Emergency Department Visits, 2004 – 2008



Source: Substance Abuse and Mental Health Services Administration, Office of Applied Studies

2.3 ASSOCIATED MORTALITY OF PRESCRIPTION DRUG ABUSE

One consequence of prescription drug abuse is accidental overdose. Researchers are alarmed at the increased number of deaths related to prescription medication misuse (Bollinger, et al., 2005; Substance Abuse and Mental Health Services Administration, 2007). Deaths associated with drug overdose (e.g., unintentional drug poisoning) have increased 5.3 percent during the decade from 1980 to 1990 (Paulozzi, 2006). During the

years 1990 to 2002, the United States mortality rate as a result from drug overdose increased 18.1 percent (Paulozzi, Budnitz, & Xi, 2006). This growth in mortality rate has been largely attributed to use of opioid analgesics, which had a 91.2 percent increase in deaths reported (Paulozzi, Budnitz, & Xi, 2006). During the years 1999 to 2002, heroin and cocaine mortality rates increased 12.4 percent and 22.8 percent, respectively (Paulozzi, Budnitz, & Xi, 2006).

In 2006, there were 26,400 drug overdose (all drugs) deaths in the U.S. (Warner, Chen, & Makuc, 2009). In the same year, there were 295 deaths related to prescription drug misuse in West Virginia (Hall et al., 2008). Most recent mortality data from DAWN showed that in ten states (Maine, Maryland Massachusetts, New Hampshire, New Mexico, Oklahoma, Oregon, Utah, Vermont, and Virginia), the total deaths related to prescription drug misuse was 4,454 (Substance Abuse and Mental Health Services Administration, 2009b). From 2003 to 2007, the range in mortality rates related to prescription drug misuse has increased from 10 percent (Maine) to 21 percent (New Mexico) (Substance Abuse and Mental Health Services Administration, 2009b). Between the years 2004 to 2007, the state of Washington reported 2,194 deaths involving drug overdose, and of these, 1,668 (76%) involved prescription opioids (Coolen, Lima, & Sabel, 2009). Table 2.1 shows the CPDs most commonly associated with mortality.

Table 2.1 Number and Percentages of Deaths Attributed to Overdose of Prescription Opioids

Drug	Number of deaths (%)
Methadone	1,068 (64)
Oxycodone	382 (22.9)
Hydrocodone	232 (13.9)
Fentanyl	76 (4.6)
Propoxyphene	61 (3.7)
Hydromorphone	60 (3.6)
Codeine	53 (3.2)
Morphine	40 (2.4)
Meperidine	11 (0.7)
Sufentanil	1 (0.1)

Source: CDC, MMWR Weekly, October 30, 2009

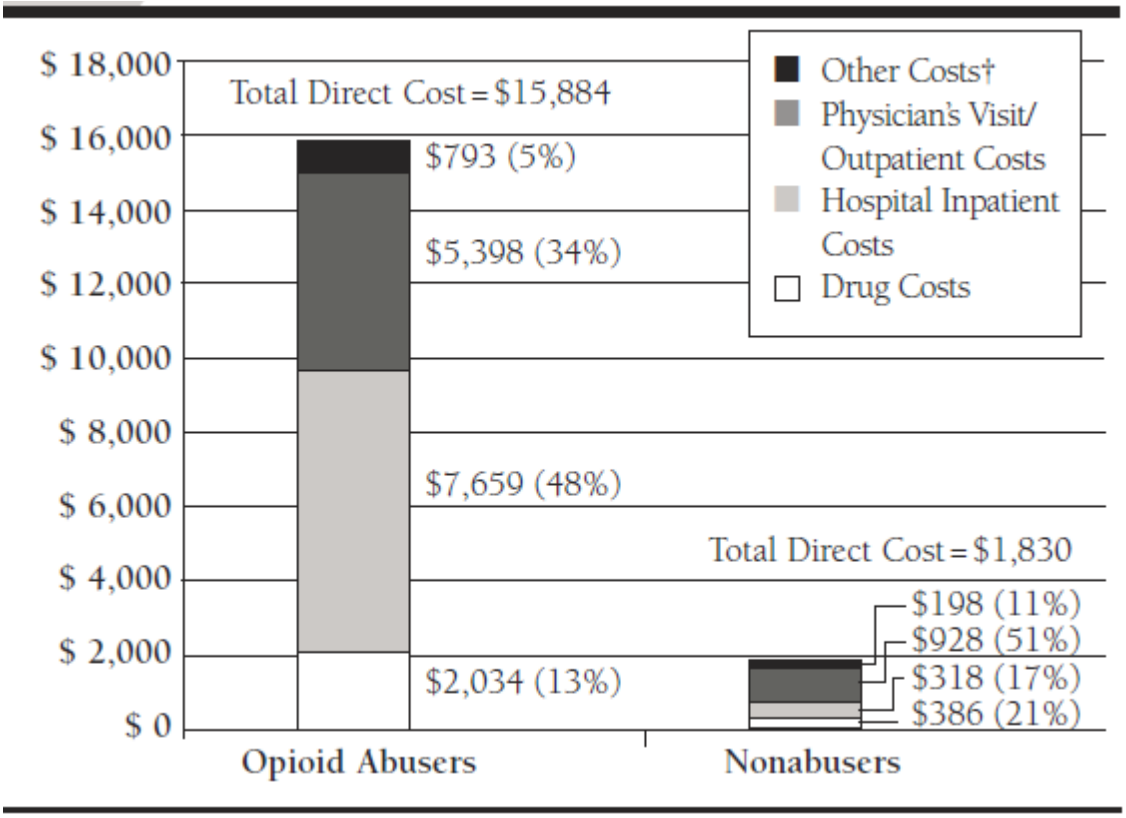
2.4 ECONOMIC BURDEN OF PRESCRIPTION DRUG ABUSE

There are no known studies that definitively capture the economic burden of prescription drug abuse. The Office of National Drug Control Policy (ONDCP) estimated total costs of $180.8 billion (2002 dollars), which represented a 68 percent increase over 1992 costs of $107.5 billion (Office of National Drug Control Policy, 2004). The total costs are comprised of health care cost, productivity costs and other indirect costs, such as those related to criminal justice and corrections (Office of National Drug Control Policy, 2004). In 2009, the Integrated Care Collaboration (ICC), which is a Central Texas health care organization designed to improve access to health care for the uninsured, reported that nine patients utilized 2,678 ED visits over a six year period (Rosser, 2009). Eight of the nine above patients had a diagnosis of drug abuse, with estimated ED costs of $3 million, which was charged to hospitals and taxpayers. Based on the data from ONDCP and reported estimates of prescription drug abuse, one can conclude that prescription drug abuse has a substantial economic burden on society.

Other studies related to the economic burden of prescription drug abuse have specifically focused on prescription opioids (Birnbaum, et al., 2006; White & Birnbaum, 2007; White et al., 2005). In a 2003 study using prescription claims data, the results showed that opioid abusers, compared to non-abusers, had direct health care costs that were eight times higher ($15,884 vs. $1,830, $p < 0.01$) (White, et al., 2005). Additionally, it was reported that prescription opioid abusers' mean drug costs were five times higher than those of non-abusers ($2,034 vs. $386, $p < 0.01$) (White, et al., 2005). See Figure 2.2.

The extra cost associated with patients who abused opioids were estimated at $14,054 per-patient on an annual basis. The higher costs of opioid abusers compared to non-abusers were due to greater utilization of outpatient (18.7 vs. 7) and ED visits (4 vs. 1), respectively (White, et al., 2005). Similarly, a news report issued by Medco Health Solutions revealed that patients identified as prescription drug abusers had drug costs seven times greater than the average Medco participant (Medco Health Solutions, 2005). Consequently, prescription drug abusers have higher resource utilization, resulting in an economic drain on the health care system. Moreover, a report by the Coalition Against Insurance Fraud estimated that prescription drug diversion costs insurers up to $73 billion per year (Coalition Against Insurance Fraud, 2007).

Figure 2.2 Average Annual Direct Costs of Opioid Abusers and Non-abusers 1999 to 2002



Source: White et. al., 2005

2.5 DIVERSION OF PRESCRIPTION DRUGS

Prescription drugs are diverted for misuse and abuse using a variety of methods. Diversion can be defined as the unlawful trafficking or possession of pharmaceuticals from their intended lawful medical destination for the purpose of illicit use (United States General Accounting Office, 2002) (see Table 2.2 for definitions of commonly used terms in prescription drug abuse). Prescription drugs are usually diverted through doctor shopping, forgery, theft, burglary, unscrupulous physicians and pharmacists, rouge internet pharmacies, and healthcare workers (Cooper, 1993; Wartell & La Vigne, 2004).

Below is an overview describing the various methods commonly employed in diverting CPDs.

Table 2.2 Definitions of Commonly Used Terms in Prescription Drug Abuse

Term	Definition
Diversion	The transfer of a controlled substance from a lawful to an unlawful channel of distribution or use
Doctor shopping	Visiting multiple physicians to obtain multiple prescriptions for CPDs
Prescription Drug Abuse	Intentionally taking medication not prescribed or outside of the prescribed directions
Prescription Drug Misuse	Unintentionally taking prescribed medication incorrectly or being poisoned by someone else. Term is also used interchangeably with prescription drug abuse.
Robbery	Involves the unlawful removal of property by way of violence or threat
Theft/burglary	The unlawful removal of CPDs from manufacturers, pharmacies or patients' homes.

Compiled from: Inciardi, et al., 2009; Kraman; Longo et al., 2000; National Conference of Commissioners on Uniform State Laws, 1994; National Institute on Drug Abuse, 2001

2.5.1 DOCTOR SHOPPING

"Doctor shopping" is a term used to describe patients who seek multiple doctors for the purpose of obtaining controlled substance prescriptions (Blumenschein, Karen et al., 2010; Longo et al., 2000; United States General Accounting Office, 2002). Quite often doctor shopping involves patients faking injuries or symptoms of pain when visiting doctors they are encountering for the first time or visiting multiple doctors for the same symptoms. This practice also occurs in the emergency department (ED) (Blumenschein, Karen, et al., 2010; Longo, et al., 2000). Doctor shopping can occur at physician's, veterinarian's and dentist's offices as well (Wartell & La Vigne, 2004).

Furthermore, in a review of the literature on the use of standardized patients in medical practice, the authors concluded that doctors can be easily deceived by patients

(Jung & Reidenberg, 2006). People naturally expect others to tell the truth; it is this "truth bias" that most physicians have, which allows patients to dupe them into prescribing CPDs (Buller & Burgoon, 1996; Jung & Reidenberg, 2006). The concept of a "truth bias" is derived from communication studies and it is based on society's natural expectation that people are truthful (Buller & Burgoon, 1996). The impact of doctor shopping is highlighted in a study (Hall et al., 2008), which showed that 63 (21.4%) of overdose deaths in West Virginia involved doctor shopping.

2.5.2 FORGERY

Prescription forgeries are another means by which patients attempt to divert medications from medical to illicit use. In a survey by the National Center on Addiction and Substance Abuse, forged or altered prescriptions were mentioned by pharmacists and physicians as a common method for diverting CPDs (Bollinger, et al., 2005; Wilsey et al., 2010). Different methods of forgery can be used by patients to obtain CPDs. Altering prescriptions is a common technique used to deceive pharmacists into dispensing a higher quantity than initially prescribed by the physician (e.g., changing a '30' to an '80') (Blumenschein, 1997; Gasbarro, 1999). Another alteration method involves adding refills to the prescription, when not previously authorized by the prescriber (Blumenschein, 1997). Photocopied prescriptions, as well as those written on prescription pads that have been stolen from physicians, represent another method in which patients attempt to divert prescription medications. Counterfeit prescriptions are usually phoned in to the pharmacy voice mail system, or called in after normal office hours, which makes it harder for the pharmacist to verify the legitimacy of the

prescription (Blumenschein, 1997; Gasbarro, 1999; National Drug Intelligence Center U.S. Department of Justice, 2005).

2.5.3 THEFTS/BURGLARIES

National statistics are limited in availability for thefts and burglaries related to CPDs. However, evidence exists in data clearing houses and media reports that underscore the extent of the problem. Below is a brief overview of what evidence exists. Thefts of CPDs represent one way in which drug diversion occurs. It is not uncommon for individuals to take prescriptions from their friends and relatives for their own personal use or distribution (McCabe & Boyd, 2005; Office of National Drug Control Policy, 2007; Substance Abuse and Mental Health Services Administration, 2010). In fact, The National Survey on Drug Use and Health (NSDUH) reported that most people misusing prescription medication received the drug from a family or friend. Wholesalers are another point in the drug supply chain at which theft occurs. In 2003, there were 2,753,928 dosage units stolen from pharmacies, manufacturers, distributors and importers/exporters (National Drug Intelligence Center U.S. Department of Justice, 2005).

Pursuing this further, burglary of pharmacies and thefts during drug deliveries have risen dramatically in the past seven years. From 2003 to 2009, there was a 600 percent increase in documented burglaries, 36 to 251 (Rx Patrol, 2010). There are no official national statistics on pharmacy robberies; however, estimates are available from R_xPatrol, a national clearinghouse and database of reported crimes related to pharmacy burglaries and robberies. Since its inception in 2003, R_xPatrol has documented 5,873 incidents, which primarily consists of robberies (1,646), fraud (1,849) and burglaries

(1,111). Ninety-seven incidents in the state of Texas are recorded in the RxPatrol database. The majority (69%) of the incidents were attempted burglaries (e.g., break-ins) via drive through windows.

Additionally, at least one study was conducted using LexisNexis Academic service to search for articles related to pharmacy thefts and robberies (Brushwood & Kimberlin, 2004). The results of media searches for pharmacy thefts or robberies yielded 2,423 articles for the years 2001 to 2002, which represented a 133 percent increase compared to the 1,038 articles from 1993 to 1994 (Brushwood & Kimberlin, 2004). In 2006, there were 981 reports of CPD theft reported to the DEA; 88 percent were thefts in pharmacies (McLaughlin, 2007). Night-time break-ins and armed robberies accounted for 577 (67%) and 291 (33%), respectively, of pharmacy thefts (McLaughlin, 2007). Additionally, media reports have involved pharmacists shooting suspects in self-defense during robbery attempts (Vivian, 2009; Vivian & Brushwood, 1991).

2.5.4 Diversion Involving Physicians

Although many physicians swear to uphold the Hippocratic Oath of practicing ethical medicine, some are involved in prescription drug diversion. The National Center on Addiction and Substance Abuse at Columbia University (CASA) conducted a randomized national survey of physicians (n = 979), which had a response rate of 31.1 percent. The results showed that 57 percent of physicians believed that physicians are responsible for preventing prescription drug abuse (Bollinger, et al., 2005). Although more than half of physicians in the CASA survey felt responsible for preventing prescription drug abuse, there are physicians who routinely prescribe CPDs to patients for

nonmedical use (Drug Enforcement Administration, 2007). These physicians are known as "script docs."

National statistics on the number of physicians involved with diversion are unavailable. However, the Drug Enforcement Administration (DEA), Office of Diversion has documented approximately 245 cases (2004 to 2009) where physicians have been disciplined for their role in diverting CPDs (Drug Enforcement Administration, 2010). For example, a Louisiana doctor was sentenced to 37 months in prison, to be followed by three years of probation for distribution of oxycodone, hydrocodone and benzphetamine (Didrex®) (Drug Enforcement Administration, 2010). Another doctor in Philadelphia was convicted of illegal distribution of CPDs. Court documents showed that from 2001 to 2007, the doctor prescribed medication to patients in exchange for cash payments. He was subsequently sentenced to 60 months in prison and forced to forfeit $600,000 (Drug Enforcement Administration, 2010).

Houston, Texas has become a hub for prescription drug diversion involving physicians (Olsen, 2010). The Houston Chronicle newspaper has been consistently reporting on unethical physicians and how their behavior has impacted the community. In July 2010, The Chronicle reported that there were at a minimum, 150 "pill mills" operating in the Houston area (Olsen, 2010). "Pill mills" are pain clinics or physician offices with the primary objective of providing CPDs to patients for cash, regardless of medical necessity (Fry, 2008). They are typically staffed by a nurse or physician assistant who typically writes prescriptions for the same CPDs (i.e., hydrocodone/acetaminophen [Vicodin®], alprazolam [Xanax®], carisoprodol [Soma®]) (Fry, 2008).

To further compound Houston's problems, Louisiana banned doctor shopping by making it unlawful for citizens to simultaneously fill CPD prescriptions from more than one physician (Johns, 2007). This has resulted in people migrating to Texas to obtain diverted CPDs (Horswell, 2010). The Houston Chronicle also obtained records that show Texas citizens have visited up to 10 physicians on the same day and obtained prescriptions for the "triple cocktail." The "triple cocktail" or "Houston triple" is a heroin like high producing combination of the prescription drugs hydrocodone/acetaminophen (Vicodin®), carisoprodol (Soma®) and alprazolam (Xanax®). Furthermore, there are reports that unscrupulous pain management centers in Houston are profiting upwards of $1.2 million annually (Olsen, 2010). One example from Houston involves a physician who had written 43,000 prescriptions for CPDs in a 15-month period (Horswell, 2010).

2.5.5 Diversion Involving Pharmacists

Pharmacists have been consistently regarded among America's most trusted professionals (Saad, 2008). However, pharmacists are also involved in the diversion of CPDs. For example, a Columbus, OH pharmacist was charged with 227 counts of illegally distributing oxycodone, hydrocodone, alprazolam and diazepam (Woods, 2010). The pharmacist in the case was also charged with money laundering. In Auburn, California a 71 year old pharmacist was barred from dispensing CPDs after the local police discovered that he was dispensing CPDs to patients presenting invalid prescriptions (Staff, 2008). Furthermore, as the sole pharmacy owner in the previously mentioned case, he was unable to provide documentation for over 20,000 dosage units of hydrocodone containing medications.

In Nashville, TN a pharmacist was arrested for trading CPDs for sexual favors (WKRN-TV Nashville, 2009). In April 2010, a Salt Lake City, UT pharmacy manager had his license revoked after the DEA uncovered numerous firearms, cocaine and CPDs at his home (Fox13now.com, 2010). A federal agent characterized the pharmacist as a "drug trafficker" and the DEA is seeking a maximum sentence of life in prison in the case.

National data on pharmacist involvement in diversion has not been compiled and the available literature mainly focuses on pharmacist diverting CPDs for personal use. Some pharmacists obtain CPDs by pilfering pills from the pharmacy inventory (Fink 2008). Increasing prescription volume, retail pressures and the physical demand on pharmacists have attributed to the rise in drug abuse among pharmacists (Levy, 2002). In a mail survey study on substance use, pharmacists (n = 133) were asked about their abuse of prescription opioids, stimulants and anxiolytics (Kenna & Wood, 2004). The response rate among pharmacists in the study was 71.1 percent. One of the primary predictors of lifetime substance abuse among pharmacists was access to drugs ($t = 4.19$, $p < 0.05$) (Kenna & Wood, 2004).

For some pharmacists, the temptation of consistent access to CPDs makes it more difficult to avoid use. In a 2003 case, an Ohio pharmacist was consuming up to 20 tablets per day of the muscle relaxer carisoprodol. The pharmacist would create fictitious patients and then pay for the prescriptions in order to document the dispensing of the medication and not to steal from the pharmacy (Burke, 2003). His heavy abuse of carisoprodol eventually led to the police intercepting the pharmacist while he was driving down the interstate highway, in the wrong direction (Burke, 2003).

2.6 DEA PHARMACIST'S MANUAL

Even though some pharmacists are involved with prescription drug diversion, there are strict laws that govern the proper dispensing of CPDs. The DEA Pharmacist's Manual is a document to help pharmacists understand and implement the Federal Controlled Substance Act and laws pertaining to pharmacy practice (Drug Enforcement Administration Office of Diversion Control, 2010). A synopsis of the Manual is provided to highlight the responsibilities of pharmacists as they relate to CPD dispensing. All pharmacies must be registered with DEA to dispense CPDs. Pharmacies are prohibited from employing individuals who have prior felony convictions involving illegal actions related to controlled substances, unless they receive an exemption (Drug Enforcement Administration Office of Diversion Control, 2010). Any theft or significant loss of any CPDs must be reported, using a special form (DEA form 106), to the local DEA office within one day of the incident or discovery of loss (Drug Enforcement Administration Office of Diversion Control, 2010).

Furthermore, pharmacies are mandated by the DEA to maintain strict records for all CPD inventory in the pharmacy. Records on the purchase, receipt, distribution, dispensing and destruction must be readily available upon inspection by a DEA field officer. All records pertaining to CPDs must be maintained in the pharmacy for a period of two years. Schedule II (C-II) CPD [e.g., oxycodone controlled release (Oxycontin®)] inventory records must be maintained separately from other prescription drugs and other CPD records. Additionally, many pharmacies keep C-II CPDs in a locked safe and separate from the other medications stocked in the pharmacy (Drug Enforcement

Administration, 2008b). The DEA also requires that a biennial inventory be conducted for CPDs and C-IIs must be physically counted. C-II CPDs must be ordered with a special form from the DEA (Form 222) only by persons granted a power of attorney (e.g., pharmacist-in-charge) to sign the order request. Upon receipt of the C-II order, the pharmacist on duty must document the number of bottles received of each drug and the date of receipt.

Prescription validity is based on the legitimate prescribing by a practitioner in his or her normal course for patient care. The pharmacist has a duty to verify that any prescription for a CPD must be for a legitimate medical reason and she/he must exercise "professional judgment," if there is any doubt about the legitimacy (Drug Enforcement Administration Office of Diversion Control, 2010). When doubt exists, the pharmacist does not have to dispense the CPD. However, if the pharmacist ignores obvious cues (e.g., excessive quantities, invalid prescriber DEA number) to the illegitimacy of a controlled substance prescription, she/he can be prosecuted for felony distribution of CPDs (Drug Enforcement Administration Office of Diversion Control, 2010).

2.7 INTERNET PHARMACIES

Internet pharmacies have been reported as a main source of diversion by the media, government reports, and CASA concerning prescription drug abuse. However, researchers have reported contradictory results when attempting to quantify the magnitude of the internet as a source of diverted CPDs. Foreman et al. (2006) conducted a study to quantify the number of websites providing CPDs without requiring a prescription. The highest number of websites was yielded by using the search terms "no prescription (NP) codeine." Based on the first 100 links found by Google™ searches, the availability of

websites offering the aforementioned medications were in the range of 53 percent to 88 percent throughout the study period. The numbers varied over a three month period due to the temporary nature of the websites. Consequently, the results showed, as of September 1, 2004 there were 302 pharmacy websites in 44 different countries offering CPDs (Forman, et al., 2006). Moreover, 189 (65%) pharmacies located in the US did not require a prescription to obtain opioid prescription drugs. Foreman's results may be higher than other reports because he used broader search terms. See Table 2.3 for definitions of common terms used with internet pharmacies.

Table 2.3 Common Terms Associated with Internet Pharmacies

Term	Definition/Explanation
Anchor site	Sites that act as direct suppliers/shipping prescriptions
No prescription required	Sites that explicitly state no prescription needed
Online consultation	Patient fills out an online questionnaire regarding medical history
Portal sites	Sites that advertise and/or provide a link to anchor sites
VIPPS®[a]	Websites that have been verified through a process established by NABP[b] to assure consumers of legitimate online pharmacies

[a]VIPPS - Verified Internet Pharmacy Practice Sites
[b]NABP - National Association of Boards of Pharmacy

Since 2004, CASA has conducted several studies to determine the prevalence of internet pharmacies providing CPDs. In 2008, CASA concluded that 365 websites were selling CPDs (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 2008). Fifty-six percent of the websites were described as portal sites. Anchor sites, which were the direct suppliers, accounted for 159 sites (44%). Table 2.4 describes the trend of available internet pharmacy websites and the type (anchor or portal) from 2004 to 2008 (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 2008). Benzodiazepines were the most

commonly offered CPDs available through the internet, followed by opioids (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 2008). Table 2.5 describes the trend in the most commonly offered CPDs found on websites in the study from 2004 to 2008. Although the availability of most of the drug classes have remained stable or decreased, the prevalence of websites selling stimulants increased from 14 (8%) in 2006 to 43 (27%) in 2008.

Similar to Forman et al., the CASA data showed that 135 (85%) of websites did not require a prescription to obtain CPDs in 2008. Table 2.6 describes the trend in anchor websites that did not require a prescription, as well as those requiring a prescription to obtain CPDs. Even more alarming was the ease at which it was reported that minors could access some of the websites to order medication, if they had a credit card available (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 2008). The CASA study also collected information on location of websites or the origin of the drug shipment. Table 2.7 describes the trend regarding the origin of medication shipments of internet pharmacies (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 2008). Based on the CASA data, the internet is an easily accessible means for internet users to obtain CPDs, especially without a prescription (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 2008).

Table 2.4 Frequency of Internet Sites Selling or Advertising Controlled Prescription Drugs 2004 - 2008

	2004 N (%)	2005 N (%)	2006 N (%)	2007 N (%)	2008 N (%)
Sites selling drugs (anchor sites)	154 (31%)	154 (39%)	174 (51%)	187 (32%)	159 (44%)
Sites advertising drugs (portal sites)	338 (69%)	242 (61%)	168 (49%)	394 (68%)	206 (56%)
Total sites	492 (100%)	396 (100%)	342 (100%)	581 (100%)	365 (100%)

Source: The National Center on Addiction and Substance Abuse.

Table 2.5 Frequency of Internet Availability of Controlled Prescription Drugs by Class 2004 - 2008

	2004 N (%)	2005 N (%)	2006 N (%)	2007 N (%)	2008 N (%)
Benzodiazepines	143 (93%)	143 (93%)	154 (89%)	147 (79%)	143 (90%)
Opioids	101 (66%)	115 (75%)	125 (72%)	120 (64%)	91 (57%)
Stimulants	42 (27%)	34 (22%)	14 (8%)	21 (11%)	43 (27%)
Barbiturates	2 (1%)	15 (10%)	2 (1%)	4 (2%)	3 (2%)
Total anchor sites	154 (100%)	154 (100%)	174 (100%)	187 (100%)	159 (100%)

Source: The National Center on Addiction and Substance Abuse.

Table 2.6 Frequency of Internet Pharmacy Anchor Sites Requiring and Not Requiring Prescriptions 2004 to 2008

	2004 N (%)	2005 N (%)	2006 N (%)	2007 N (%)	2008 N (%)
Sites not requiring prescriptions	144 (93.5%)	147 (95.5%)	155 (89.1%)	157 (84.0%)	135 (84.9%)
No prescription needed for med	63 (43.8%)	53 (36.1%)	49 (31.6%)	52 (33.1%)	57 (42.2%)
Online consultation needed for med	76 (52.7%)	84 (57.1%)	90 (58.1%)	83 (52.9%)	61 (45.2%)
No mention of prescription for med	5 (3.5%)	10 (6.8%)	16 (10.3%)	22 (14.0%)	17 (12.6%)
Sites requiring prescriptions	10 (6.5%)	7 (4.5%)	19 (10.9%)	30 (16.0%)	24 (15.1%)
Total anchor sites	154 (100%)	154 (100%)	174 (100%)	187 (100%)	159 (100%)

Source: The National Center on Addiction and Substance Abuse

Table 2.7 Frequency of Origin of Drug Shipment 2004 - 2008

	2004 N (%)	2005 N (%)	2006 N (%)	2007 N (%)	2008 N (%)
U.S.	43 (28%)	57 (37%)	62 (36%)	48 (26%)	38 (24%)
Non-U.S.	71 (46%)	61 (40%)	57 (33%)	91 (48%)	63 (40%)
Unknown	40 (26%)	36 (23%)	55 (31%)	48 (26%)	58 (36%)
Total Web sites	154 (100%)	154 (100%)	174 (100%)	187 (100%)	159 (100%)

Source: The National Center on Addiction and Substance Abuse

Schepis et al. (2008) conducted a study using the internet search engine Google™ to determine the availability of websites offering to sell controlled prescription stimulants (e.g., methylphenidate [Ritalin®], phendimetrazine tartrate [Bontril®]). The search was conducted with several different drug names and the term "no prescription." The results

of the study indicated more sites offered to sell C-III stimulants used for obesity (i.e., appetite suppressants) than stimulants (C-IIs) used for attention-deficit hyperactivity disorder (ADHD) (Schepis, Marlowe, & Forman, 2008). Regarding C-III CPDs for obesity that did not require a prescription, the mean (±SD) monthly portal sites offering to sell these were 50.7±10.9 and mean monthly anchor sites were 1.2 (SD not reported) (Schepis, Marlowe, & Forman, 2008). Comparatively, among C-II websites that did not require a prescription, the mean monthly portal websites offering ADHD stimulant CPDs were 40.6±9.1 and the mean anchor sites were 0.4 (SD not reported) (Schepis, Marlowe, & Forman, 2008).

To validate previous studies on the prevalence of prescription drug abuse related to the internet, Cicero et al. (2008) conducted a study to determine if the results would be comparable to previous studies. In this study, 685 prescription opioid abusers from 85 treatment centers around the U.S. responded to a survey regarding where they usually obtained CPDs, and if the internet was one of their sources for obtaining prescription opioid drugs. Drug dealers, doctors, friends and family were the most commonly mentioned (58%) single or multiple sources for obtaining prescription opioids (Cicero et al., 2008). Yet, internet use as one source to obtain prescription opioids was only mentioned by 6 percent (41 of 685) of respondents.

Also, the authors attempted to purchase medications from a random sample of 10 percent of the internet websites promoting CPDs, from August to September 2006 (Cicero, et al., 2008). In many cases, the programs charged a prescription club fee ($179.00 - $499.00) to purchase CPDs (e.g., Vicodin® or OxyContin®). However, after paying the fee, they found that the drugs were out of stock or they were offered

prescriptions for tramadol (Cicero, et al., 2008). They were successful in purchasing tramadol at a substantially higher price compared to the retail value. The authors were unsuccessful in purchasing any C-II or C-III CPDs advertised on the internet. The authors concluded that the internet is not a major source of CPDs based on the results of the study.

2.7.1 Efforts to Combat Rogue Internet Pharmacies

The Verified Internet Pharmacy Practice Sites (VIPPS) is a program that was established in 1999 to provide a safeguard to consumers using online pharmacies, whereby legitimate pharmacies can be distinguished from rogue internet pharmacies (National Association of Boards of Pharmacy, 2010). It is a voluntary program in which internet-based pharmacies submit an application and the respective state boards of pharmacy perform an on-site visit. If the pharmacy meets the approval of the inspectors, they are allowed to display the VIPPS seal on their pharmacy web site. Web sites displaying this seal indicate to consumers that the internet pharmacy has been vetted, and recognized as a legitimate pharmacy (National Association of Boards of Pharmacy, 2010).

More recently a federal law was passed specifically aimed at reducing the number of internet pharmacies involved in providing prescriptions to patients illegally via the internet. In the past, internet pharmacies would hire a physician to prescribe medication to patients who filled out an online profile (e.g., medical history of patients reviewed by a physician), without conducting a face-to-face examination. The Ryan Haight Online Pharmacy Consumer Protection Act of 2008 was enacted to protect consumers, especially teenagers from being able to obtain prescription drugs online without seeing a doctor.

This new amendment to the Controlled Substance Act requires at least one in-person medical exam before any CPD can be distributed via the internet (National Drug Intelligence Center U.S. Department of Justice, 2008). This law also mandates harsher prosecution for individuals engaged in illegally providing CPDs via internet pharmacies.

2.8 MOST OFTEN ABUSED CONTROLLED PRESCRIPTION DRUGS

Controlled prescription drugs (CPDs) are commonly prescribed to treat a variety of medical conditions (e.g., pain, anxiety and ADHD). In spite of their medicinal usefulness, CPDs have the potential to be physically or psychologically addicting. The following medication classes are most often abused: opioid analgesics; central nervous system depressants and stimulants.

2.8.1 OPIOID ANALGESICS

Depending on the source of pain, opioid analgesics are an effective tool for acute and chronic pain management (Trescot et al., 2008). However, the increase of opioid prescriptions dispensed in recent years is a cause for concern regarding U.S. public health safety (Bollinger, et al., 2005; Compton & Volkow, 2006). Narcotic (opioid) analgesics consist of commonly prescribed medications such as codeine, oxycodone, and hydromorphone (Cicero, Inciardi, & Munoz, 2005). Unfortunately, recent reports on non-medical use of opioids reveal that it is increasing at an alarming rate (Blanco et al., 2007). In 2005, the Drug Abuse Warning Network (DAWN) estimated that approximately 600,000 emergency department (ED) visits were the result of the misuse of prescription and over-the-counter medications (Substance Abuse and Mental Health Services Administration, 2007). Misuse of opioids is further highlighted by the fact that

hydrocodone/acetaminophen and oxycodone accounted for 94,035 ED visits in 2005 (Substance Abuse and Mental Health Services Administration, 2007). Improper use of methadone accounted for another 41,216 ED visits that year (Substance Abuse and Mental Health Services Administration, 2007).

Paulozzi et al. (2006) reported on the rising deaths related to opioid analgesics. From the years 1999 to 2002, opioid-related fatalities, as documented by death certificates, increased by 91.2% and the actual number of deaths associated with opioids was 5,528 in 2002 (Paulozzi, 2006). Paulozzi et al., shows that the increase in opioid-related incidents was correlated with the increase in prescribing of long acting opioids, (e.g., Oxycontin®) and that the problem associated with opioids is at epidemic levels (Paulozzi, 2006). Perhaps, an even greater cause for concern regarding prescription drug abuse is increasing rates among adolescents (Compton & Volkow, 2006). A research report on Teens and Prescription Drugs showed that 12th graders reported almost 10 percent usage rates in 2006 (Office of National Drug Control Policy, 2007). Oxycontin® and Vicodin® were reported to be the most abused drugs by teens (Office of National Drug Control Policy, 2007). The aforementioned statistics underscore the need for more proactive measures to curtail the abuse of opioid analgesics.

2.8.2 CENTRAL NERVOUS SYSTEM DEPRESSANTS

Central nervous system (CNS) depressants are drugs such as sedatives and tranquilizers, which consist of medications classified as barbiturates (e.g., phenobarbital) and benzodiazepines [e.g., alprazolam (Xanax®)]. Nevertheless, these drugs are used by patients for non-medical purposes. In 2004, alprazolam and clonazepam accounted for roughly half of all benzodiazepine-related ED visits (Substance Abuse and Mental Health Services Administration, 2007). From 2004 to 2005, the total non-medical use of benzodiazepines that resulted in ED visits increased by 19 percent (Substance Abuse and Mental Health Services Administration, 2007). In 2006, benzodiazepines were documented in 195,625 ED visits involving the misuse of CPDs (Substance Abuse and Mental Health Services Administration, 2008). Additionally, from 2004 to 2008 there was an 89 percent increase in the number of documented ED visits involving benzodiazepines (143,500 to 271,700) (Centers for Disease Control and Prevention, 2010). The high prevalence of abuse involving benzodiazepines represents another example of how CPDs are being abused.

2.8.3 CENTRAL NERVOUS SYSTEM STIMULANTS

Stimulant medications (e.g., methylphenidate, dextroamphetamine, mixed-salts amphetamine, and pemoline) are most often prescribed for attention deficit hyperactivity disorder (ADHD) and narcolepsy (Greenhill et al., 2002). However, stimulant abuse occurs among college students (McCabe, S.E. et al., 2005). In 2001, a study of 10,904 random respondents reported that at least four percent of college students ingested a stimulant for non-medical purposes at least once in the preceding year (McCabe, et al., 2005). In the 2005 DAWN report, stimulant misuse resulted in 10 percent (n = 138,950)

of the reported ED visits (2005 Drug Abuse Warning Network, 2007). Stimulants are a major concern for the younger generation, because of societal norms regarding early treatment of ADHD with stimulants. In a study by McCabe et al. (2004) students from 6^{th} to 11^{th} grade (n = 1,536) in the Midwest, reported a rate of illegal stimulant use of 4.5 percent. In the 2006 DAWN Report, 9,485 ED visits were associated with stimulant use (e.g., methylphenidate, amphetamine-dextroamphetamine) (Substance Abuse and Mental Health Services Administration, 2008).

2.9 TREATMENT AND PREVENTION OF PRESCRIPTION DRUG ABUSE

One goal of PDMPs is to identify persons who may be addicted to prescription drugs and provide interventional treatment (National Alliance for Model State Drug Laws, 2010). Many different treatments exist for drug and alcohol abuse. Prescription drug addiction treatment can encompass counseling methods (e.g., twelve step program) to pharmacological treatment. The majority of prescription drug abuse treatment is aimed at treating opioid addiction and dependence (Mendelson et al., 2008). Opioid addiction includes heroin as well a prescription opioids and it is often treated with methadone, buprenorphine or a combination of buprenorphine-naloxone. Buprenorphine has been shown to be a successful treatment for opioid addiction (Fiellin et al., 2006; Marsch et al., 2005). The use of buprenorphine-naloxone has also been shown to be an effective treatment for patients in the outpatient setting (Finch, Kamien, & Amass, 2007; Mendelson, et al., 2008).

Prior research has shown that physicians are not always properly trained to have the necessary conversations with patients regarding CPDs and misuse. Pharmacists, although reporting deficiencies in their own training related to pain management and

addiction, are often placed in a position to confront patients about their CPD use (Bollinger, et al., 2005). Moreover pharmacists are involuntarily involved with addiction treatment when required to dispense methadone and buprenorphine-naloxone treatment to patients with opioid addiction. In one study, 12.5 percent of community pharmacists expressed discomfort when treating patients with an opioid dependence (Raisch et al., 2005). These factors must be considered when deciding how pharmacists can utilize PDMPs to provide interventional counseling for patients.

2.10 BACKGROUND ON PRESCRIPTION MONITORING

Prescription monitoring programs have been in existence in the United States since 1940 (Fishman, et al., 2004). Most of the earlier prescription programs were termed multiple copy prescription program (MCPP) because the prescription form either used a duplicate or triplicate prescription with carbon paper between each copy (Fishman, et al., 2004). In the triplicate MCPP, one copy was retained by the prescriber, another by the pharmacy and the last form was submitted to an oversight agency (e.g., State Board of Health) (Simoni-Wastila & Tompkins, 2001). Other states adopted MCPPs, mainly with an emphasis on C-II prescriptions (Joranson, Carrow, et al., 2002). In Texas, a triplicate MCPP was instituted in 1981 for the sole purpose of monitoring C-II prescriptions (Sigler et al., 1984). New York began its triplicate program in 1972 to monitor C-II medications and in 1989 it added benzodiazepines (C-IV) (Fishman, et al., 2004). Some of the problems with the use of MCPPs were that physicians were required to purchase the forms. Physicians also felt that the forms were an intrusion on their medical practice, as

they served as a constant reminder that they were being monitored (Fishman, et al., 2004).

Federal and state agencies began to recognize that MCPPs were a burden to physicians and state administrators (Alliance of States with Prescription Monitoring Programs, 1999). In California, over 500,000 C-II prescriptions were written and filled at over 5,000 different pharmacies, which was problematic to track by paper (Fishman, et al., 2004). With the advancements in technology and the internet, many states (n = 34) have switched over to an electronic database documentation and management system (Alliance of States with Prescription Monitoring Programs, 1999). Electronic monitoring is less intrusive for physicians and has not been shown to cause an alteration in physician prescribing patterns for CPDs (Simoni-Wastila & Tompkins, 2001; United States General Accounting Office, 2002). Administratively, it is easier for physicians to secure prescription pads for electronic monitoring, than it would be to have multiple copy prescription pads. Earlier MCPPs only monitored C-II prescriptions, which typically lead to a decrease in physicians' prescribing C-II CPDs. However, this practice has also been associated with physicians' prescribing C-III CPDs (e.g., Vicodin®) in greater quantities to offset the reduction in C-II prescribing. Most contemporary electronic PDMPs monitor a broader range of scheduled medications (C-II to C-IV) or (C-II to C-V) (Manchikanti, 2007; Manchikanti, Brown, & Singh, 2002; United States General Accounting Office, 2002).

Before the question regarding the pros and cons of prescription monitoring programs can be properly addressed, a distinction needs to be made between proactive programs and reactive programs. In proactive programs, reports are generated unsolicited, based on predetermined threshold levels programmed into the software or by periodic examination of data. For example, a scenario in which a patient receiving multiple CPDs from multiple pharmacies, written by different prescribers can result in a report or letter to the involved practitioners. Once a patient meets the predetermined threshold, prescribers and/or pharmacists that provided patient care are notified. In reactive programs, data are collected and stored but is provided only when requested by a health care practitioner or law enforcement official. Below (i.e., KASPER) highlights an exemplary monitoring program as well as a brief discussion of the National All Schedule Prescription Electronic Reporting (NASPER) future national monitoring database. The Kentucky All Schedule Prescription Electronic Reporting (Kentucky All Schedule Prescription Electronic Reporting [KASPER]) is the program that many other state PDMPs are modeled after, as well as the proposed NASPER program (Manchikanti, Whitfield, & Pallone, 2005).

2.10.1 KASPER

The increase in prescription drug abuse lead the government and local law enforcement officials to investigate methods to decrease and prevent diversion of prescription medications, while still availing these medications to patients who need them (Fishman, et al., 2004; Joranson, Carrow, et al., 2002). In 1999, Kentucky implemented KASPER to address prescription drug abuse (Kentucky All Schedule Prescription Electronic Reporting [KASPER], 2006). In 2004, eKASPER was launched to allow health care professionals and other authorized users (e.g., law enforcement personnel)

access to reports via the internet (Blumenschein, K. et al., 2010). The KASPER model for monitoring controlled substance medication activity has been adopted by the Federal Government in the form of the National All Schedules Prescription Electronic Reporting Act (NASPER) (Manchikanti, Brown, & Singh, 2002; Manchikanti, Whitfield, & Pallone, 2005). Although the internet allows online tracking of controlled prescription histories, questions still remain as to the effectiveness of the online accessible PDMPs (Brushwood, 2003; Katz, et al., 2008). More importantly, there have been no known studies to date that have attempted to predict the factors associated with pharmacists' intentions to utilize this type of patient monitoring program.

2.10.2 NATIONAL ALL SCHEDULE PRESCRIPTION ELECTRONIC REPORTING (NASPER)

NASPER was created by members of the American Society of Interventional Pain Physicians (ASIPP) to better provide access to CPDs, while attempting to decrease abuse and diversion (Manchikanti et al., 2005). The main goal of NASPER is to connect PDMPs in each state and provide more uniformity across the various state programs. NASPER funding could be used for new state programs or to improve an existing program and collect data on schedule II thru IV drugs (Manchikanti, et al., 2005; Wang & Christo, 2009). NASPER has received limited funding and other measures have been undertaken to allow for state data sharing (Alliance of States with Prescription Monitoring Programs, 2011). Proponents have argued that individual state programs, which have been funded primarily through the Bureau of Justice (Harold Rogers Program), lack the proper structure and have been less effective than the proposed NASPER (Manchikanti, et al., 2005). State programs have largely been used for law enforcement investigations and not as a means of enhancing public health by allowing

physicians and pharmacists' timely proactive data on patients addicted to or diverting CPDs.

2.11 STATES WITH PRESCRIPTION MONITORING PROGRAMS

In the absence of sufficient NASPER funding, the Harold Rogers Program has provided states with federal funds to create and improve PDMPs (See Table 2.8) (Bureau of Justice Assistance, 2009). The Harold Rogers Program has provided approximately $48 million from 2002–2010 to help states establish and maintain prescription drug monitoring programs (PDMPs) aimed at reducing diversion and abuse of pharmaceuticals (Drug Enforcement Administration, 2008a). Most PDMPs are reactive instead of proactive (Manchikanti, 2007; Simeone & Holland, 2006). In reactive programs, reports are typically mailed to prescribers or pharmacists only after the practitioner has submitted a request.

Table 2.8 Bureau of Justice Harold Rogers Program Funding Awards to States with Active Prescription Drug Monitoring Programs 2003-2008

State	Housing Agency	Schedules Monitored	Total Funding Awarded ($)[a]
Alabama	Department of Public Health	II – V	2,200,000
Arizona	Board of Pharmacy	II – IV	100,000
California	Bureau of Narcotic Enforcement	II – IV	2,037,745
Colorado	Department of Regulatory Agencies	II – V	850,000
Connecticut	Department of Consumer Protection	II – IV	764,206
Hawaii	Department of Public Safety	II – IV	1,099,484
Idaho	Board of Pharmacy	II – IV	288,622
Illinois	Department of Health and Human Services	II – V	1,549,994
Indiana	Professional Licensing Agency	II – V	1,661,613
Iowa	Department of Public Health	II – IV	642,963
Kentucky	Health and Family Services, Inspector General	II – V	2,140,000
Louisiana	Board of Pharmacy	II – V	450,000
Maine	Office of Substance Abuse	II – V	1,433,213
Massachusetts	Department of Public Health	II	1,719,998
Michigan	Bureau of Health Professions	II – V	350,000
Minnesota	Board of Pharmacy	II – IV	395,899
Mississippi	Board of Pharmacy	II – V	784,915
Nevada	Board of Pharmacy	II – IV	1,600,146
New Mexico	Board of Pharmacy	II – IV	245,650
New York	Bureau of Narcotic Enforcement	II – V	1,800,000
North Carolina	Department of Health and Human Services	II – V	449,900
North Dakota	Board of Pharmacy	II – V	772,315
Ohio	Board of Pharmacy	II – V	1,730,000
Oklahoma	Bureau of Narcotics and Dangerous Drugs	II – V	1,359,820
Pennsylvania	Office of Attorney General	II	530,000
Rhode Island	Board of Pharmacy	II – III	400,000
South Carolina	Department of Health and Environmental Control	II – IV	350,000
Tennessee	Board of Pharmacy	II – V	543,459
Texas	Department of Public Safety	II – V	724,437
Utah	Department of Commerce	II – V	80,005
Vermont	Department of Health	II – IV	748,388
Virginia	Board of Pharmacy	II – IV	1,412,300
West Virginia	Board of Pharmacy	II – IV	930,000
Wyoming	Board of Pharmacy	II - IV	214,529

[a]The maximum award since 2004 was 400,000; in 2003 CA was awarded $887,745 and Nevada was awarded $515,267.

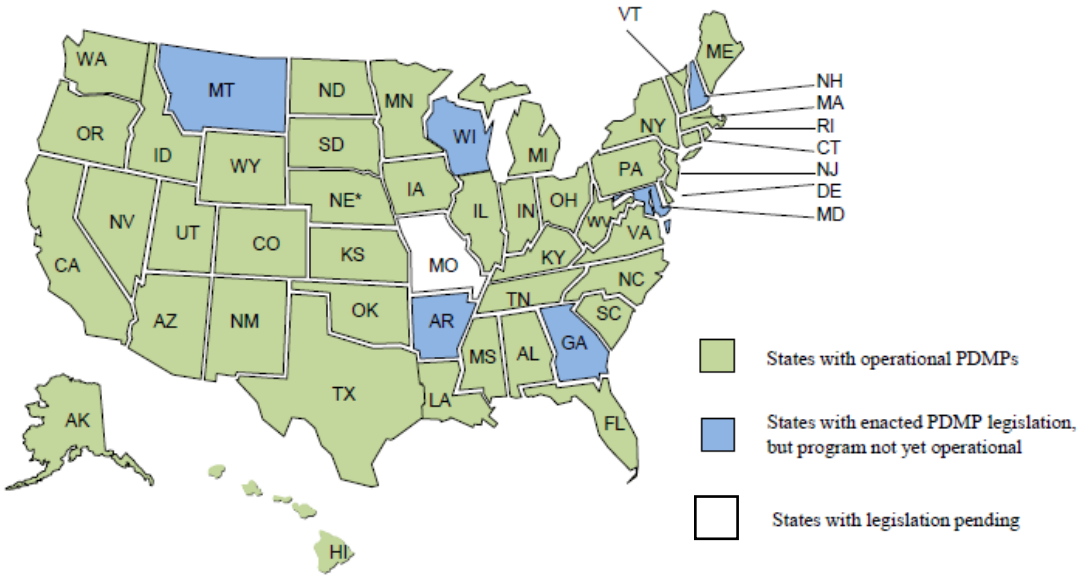
Source: Compiled from The Bureau of Justice Assistance Prescription Monitoring Program 2007, 2008 and Blumenschien et al., 2010

In a proactive PDMP, both physicians and pharmacies can receive data on patients without requesting a report (Blumenschein K, 2010). In proactive programs, patients are identified after data analysis or with the use of sophisticated software that identifies patients, physicians and pharmacies with unusual activity related to CPDs. For example, if a patient exceeds 10 prescribers in a year, then the involved prescribers receive a letter from the PDMP alerting them to the activities of the patient. This "proactive" alert provides the physician or other prescriber with some time to consult with the patient regarding their CPDs and potentially prevent the patient from harming himself and others (Benak et al., 2007; Manchikanti, 2007). Research by Simeone and Holland (2006) also shows that proactive programs are more effective at curtailing prescription drug abuse than programs that are simply reactive. Reactive programs are often utilized by law enforcement agencies to investigate patients or physicians (Blumenschein, K., et al., 2010; United States General Accounting Office, 2002).

In five states with active PDMPs, the state agency responsible for administering the program is a law enforcement agency (National Alliance for Model State Drug Laws, 2010). As of June 2012, Pennsylvania and Texas have not made their data accessible online to practitioners; therefore the number of requests in these states is significantly lower than PDMPs with online access. Furthermore, Pennsylvania currently only monitors C-II medications. In nineteen states with operational PDMPs, there is no state mandate for prescribers to access a PDMP report prior to prescribing a CPD. See Figure 2.3 below for the map of operational PDMPs. Pharmacist utilization of PDMP data becomes even more critical in light of states with no mandatory requirement for prescribers to access. Nevada is one of the few states that require prescribers to access a

report before prescribing a CPD (National Alliance for Model State Drug Laws, 2010). Subsequently, there is no mandate for pharmacists to register for access to state PDMP data. In many states, it is essentially left to the health care practitioners' discretion whether they register for PDMP access (National Alliance for Model State Drug Laws, 2010).

Figure 2.3 National Status of Prescription Drug Monitoring Programs (PDMPs)



Source: National Alliance for Model State Drug Laws, 2012

2.12 PROS OF PDMPs

PDMPs have many positive aspects. They have been shown to reduce the supply of available narcotic medications for illicit use (Simeone & Holland, 2006). These programs have also served as a valuable tool for law enforcement investigations into diversion and improper physician prescribing of controlled substance medications (Drug Enforcement Administration, 2008a; United States General Accounting Office, 2002).

The PDMPs also make it easier for both practitioners and law enforcement officials to identify patients who are doctor shoppers (Wang & Christo, 2009). Below is a brief overview of the impact of PDMPs.

2.12.1 REDUCED AVAILABILITY OF CONTROLLED SUBSTANCES

One of the positive aspects of prescription drug monitoring is the appropriate reduction of controlled substances being prescribed or available to the public (Simeone & Holland, 2006). Some research reports observed that a noticeable reduction in prescribing of controlled substance prescriptions is related to appropriate prescribing and a decrease in inappropriate prescribing (Sigler, et al., 1984; Simoni-Wastila et al., 2004). More importantly, reduction of CPD availability is supported by Simeone and Holland's (2006) research based on economic principles of supply and demand. Subsequently, the street value of CPDs is inversely related to availability.

In New York State, the introduction of a multiple copy prescription program (MCPP) for prescribing benzodiazepines resulted in the reduction of those prescriptions (VanHaaren, Lapane, & Hughes, 2001). When the triplicate program was first introduced in Texas in 1981, it resulted in a 60 percent decrease in scheduled II (C-II) prescriptions the following year (Sigler, et al., 1984). It is important to note that both New York and Texas have converted their triplicate prescription programs to a single serialized tamper resistant prescription form (Joranson, Carrow, et al., 2002).

2.12.2 Reduction of Law Enforcement Investigation Time

Another positive component to prescription monitoring programs is that they reduce the investigation time associated with prosecuting patients suspected of illegal diversion of prescriptions through fraud or forgery (Drug Enforcement Administration, 2008b; United States General Accounting Office, 2002). With all of the prescription records contained in an electronic database transfer, law enforcement officers do not have to visit each pharmacy individually and procure a hard copy of the prescription, because all of the information is in the database (Alliance of States with Prescription Monitoring Programs, 1999; Joranson, Carrow, et al., 2002). Physicians that are reported to the state medical board can easily have their records sequestered to provide prosecutors with their past CPD prescribing patterns (Kentucky All Schedule Prescription Electronic Reporting [KASPER]). However, some argue that reduced investigation time does not necessarily equate to less diversion as result of PDMPs (Manchikanti, 2007).

2.12.3 Expose Patients Who "Doctor Shop"

Doctor shopping as defined by the DEA occurs when patients visit multiple physicians and or pharmacies to obtain controlled substance medications (Drug Enforcement Administration, 2008b). The PDMPs allow for easier identification of those patients suspected of doctor shopping because their prescriptions are aggregated in one state database which can be accessible to health care providers and law enforcement officials (Alliance of States with Prescription Monitoring Programs, 1999; Drug Enforcement Administration, 2008a; Wang & Christo, 2009). In proactive programs, threshold levels can be set in the system, and once breached, practitioners and area

pharmacies can be alerted. For example, a physician may be notified regarding a patient who exceeds threshold levels regarding the number of prescribers, pharmacies or medications received within a given time frame (Connecticut Department of Consumer Protection, 2009; United States General Accounting Office, 2002). Proactive programs can assist physicians and pharmacists in identifying patients with unusual CPD patterns. This provides physicians with the opportunity to discuss unusual patterns with their patients and potentially identify abuse or ineffective treatment. However, most PDMPs are not proactive, which is primarily due to the extra costs associated with proactive programs (United States General Accounting Office, 2002).

2.13 CONS OF PDMPs

Although there are obvious advantages to implementing PDMPs, there are some who have concerns with the intrusiveness of an "electronic watchdog." A study by Simoni-Wastila et al. (2004), concluded that effects of the triplicate program resulted in some patients going untreated. Below are some additional arguments against the implementation of PDMPs, which may explain why some states have not passed legislature to create a PDMP.

2.13.1 HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA) CONCERNS

The Alliance of States with Prescription Monitoring Programs states that patient and practitioner confidentiality are of paramount importance to their mission (Alliance of States with Prescription Monitoring Programs, 2010). However, patient privacy is one of the main concerns with implementing electronic PDMPs (Connecticut Department of

Consumer Protection, 2009; Drug Enforcement Administration, 2008a; Joranson, Gilson, et al., 2002). In 2004, a proposed PDMP in Florida was voted down due to patient privacy issues (Hollis, 2004). The Health Insurance Portability and Accountability Act (HIPAA) of 1996 was established to protect the privacy of a patient's health information (HIPAA, 1999). The monitoring programs do not infringe upon this privacy because there is language within HIPAA that allows for health care practitioners to access information when providing care to their patients (HIPAA, 1999; United States General Accounting Office, 2002). Thus far, there have not been any reports of improper use of PDMPs by practitioners; however, many state programs include laws that criminalize the improper use of data (Joranson, Carrow, et al., 2002; United States General Accounting Office, 2002).

2.13.2 PDMPs Operating Costs

Implementation of a PDMP is associated with additional costs that may be financially burdensome to states. Costs of the programs vary by state and by the type of program instituted (e.g., only monitor schedule II). The DEA estimates that the average start-up cost for PDMPs is approximately $350,000 (Drug Enforcement Administration, 2008a). Most states have received their start-up funding from Harold Rogers grants, which are sponsored by the federal government (Bureau of Justice Assistance, 2009; United States General Accounting Office, 2002). Initially, $60 million was authorized over a five years (2006 -2010) to fund NASPER (Manchikanti, Whitfield, & Pallone, 2005). Although legislation was passed in 2005, PDMPs were only recently appropriated funds through the Federal Stimulus Package of 2009, in the amount of $2 million dollars (American Society of Interventional Pain Physicians [ASIPP], 2009). Moreover, the state

of Washington discontinued its PDMP operation due to lack of funding (Washington State Dept. of Health). Considering the economic downturn facing the U.S., delays in upgrading PDMPs to online accessibility features are expected.

2.13.3 Variability in State Prescription Monitoring Programs

Since NASPER has not been implemented to its full extent, many states have implemented PDMPs (Fishman, et al., 2004; Simoni-Wastila & Tompkins, 2001). The various state programs have been established, solely based on the needs of the individual states. Decisions regarding which schedules to monitor and the state agency authorized to oversee the PDMP varies from state to state (United States General Accounting Office, 2002). Some PDMPs are managed by law enforcement, while others may be managed by health boards (United States General Accounting Office, 2002). Although states with PDMPs have reported decreases in CPD supply, bordering states with no electronic monitoring programs typically experience an increase in drug diversion as a result (Simoni-Wastila & Tompkins, 2001; United States General Accounting Office, 2002). Many states do not have the ability to share data with other states, which can also be problematic (Alliance of States with Prescription Monitoring Programs, 1999). Until information can be shared between states and all states have PDMPs, there will be limitations regarding the effectiveness of electronic monitoring.

2.13.4 Altering Prescriber Patterns

Several studies detailing the effects of monitoring programs on prescriber behavior have been published. In particular, the triplicate programs have had a

significant impact on prescribing patterns, largely attributed to the administrative burden of special forms (Simoni-Wastila, et al., 2004; Texas Department of Public Safety, 2008; VanHaaren, Lapane, & Hughes, 2001; Wagner et al., 2003). Past research has highlighted the effects of triplicate prescription programs, negatively impacting physicians' prescribing of C-II medications, particularly long acting opioids (Fujimoto, 2001; Nwokeji, et al., 2007). In states with strict C-II laws (e.g., Texas, California), there is a noticeable increase in the number of prescriptions written for schedule III medications such as hydrocodone/acetaminophen (e.g., Vicodin®, Norco®) (Fishman, et al., 2004). This phenomenon has been described in the literature as the substitution effect (Wagner, et al., 2003). Most states have eliminated multiple copy prescription programs (MCPPs), as a result of prescriber dissatisfaction and also at the recommendation of pain management advocates (Katz, et al., 2008; Powell et al., 2002). Electronic monitoring without the mandatory use of a multiple copy prescription form has been reported to be less disruptive to appropriate prescribing patterns of CPDs (Simoni-Wastila & Tompkins, 2001).

2.13.5 Effect on Patient Care/Undertreatment

Chronic pain is a condition largely managed with pharmacological agents, however, uncertainty exists concerning optimal therapy (Reid et al., 2011). Consequently, some think PDMPs will have a negative impact on patient care, because patients will be undertreated for their pain due to physicians' fear of being monitored by the state government (Joranson, Carrow, et al., 2002; VanHaaren, Lapane, & Hughes, 2001). Patients also fear the inconvenience and or extra costs associated with making additional doctor visits because physicians may limit the supply of medication prescribed

for fear of being identified as carelessly prescribing opioids (Simoni-Wastila & Tompkins, 2001).

2.14 TEXAS PRESCRIPTION PROGRAM

In 1981, the Texas Prescription Program was established to decrease abuse and diversion of C-II medications (e.g., morphine) (National Alliance for Model State Drug Laws, 2006). The original program (triplicate) was a special triple carbon prescription form issued by the Texas Department of Public Safety (DPS). Prescribers could only prescribe C-II medications by using the triplicate (see Figure 2.4) form and patients would have seven days from the date written to fill the prescription (Texas Department of Public Safety, 2011). The physician retained a copy of the form for his/her records, and two copies were provided to the pharmacy, with one retained at the pharmacy and the third copy forwarded to DPS for their records. The restrictive nature of the triplicate program resulted in a 52 percent reduction in the number of C-II prescriptions prescribed once it was introduced. Subsequently, there was an increase in the number of C-IIIs (e.g., hydrocodone/acetaminophen) prescribed (Wastila & Bishop, 1996).

Current Prescription Monitoring

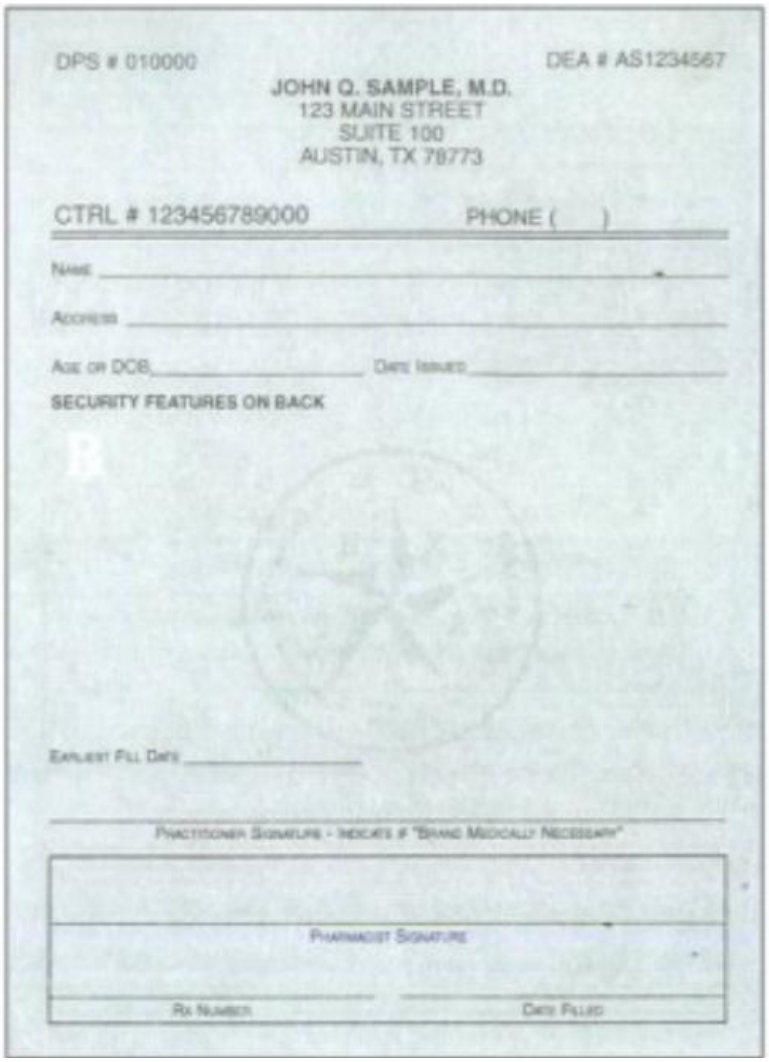
In September 1999, Texas began using a single serialized prescription form issued by DPS for use when prescribing C-II medications (Texas Department of Public Safety, 2011). The new form's data was transmitted electronically to DPS from the dispensing pharmacy and were less of an administrative burden (see Figure 2.5) (Joranson, Carrow, et al., 2002; United States General Accounting Office, 2002). Distinguishing

characteristics of the special prescription forms are a DPS unique control number which is transmitted to DPS electronically when the prescription is entered and filled by the dispensing pharmacy. A pantograph is embedded in the form to produce the words void if an attempt is made to scan or photocopy it. Additionally, thermochromatic ink is embedded in a thumb print on the back of the prescription form and when rubbed repeatedly with a finger reveals the word "safe." Lastly, each form is marked with the DPS seal on the face of the prescription (see Figure 2.5).

Figure 2.4 Texas Triplicate Prescription Form, Official Form 1982 to 1999

Source: Texas Department of Public Safety, 2010

Figure 2.5 Texas Prescription Program Single Serialized Prescription Form 1999 to 2010



Source: Texas Department of Public Safety, 2010

Figure 2.6 Texas Prescription Program Form with DPS Number 2010 to Present

Source: Texas Department of Public Safety, 2010

In March of 2008, the Texas DPS extended the time allotted to patients to fill a C-II prescription from seven to 21 days (Texas Department of Public Safety, 2008). September 1, 2008, marked additional changes to the Texas Prescription Program as data collection on all scheduled medications dispensed from community pharmacies was implemented. The special form requirement was maintained, with respect to C-II

prescriptions, but when prescribing C-III through C-IV medication, the face of the prescription must also contain the prescribers DEA number and his/her DPS number for the prescription to be considered valid (see Figure 2.6). The dispensing pharmacy is required to electronically submit dispensing information to the DPS vendor by the 15th day of the following month in which the prescription was dispensed. The Texas Prescription Program provides access to CPD reports of patients to prescribers, pharmacists and patients (Texas Department of Public Safety, 2011). The form can be either mailed or faxed to DPS and the report can be either mailed or faxed to the requestor (see Appendix A).

The Texas Prescription Program is in the process of examining major changes that would improve the current program. Most notably is the implementation of a secure online immediate access website for prescribers, pharmacists and law enforcement (TSBP Report). The Interagency Council, which is comprised of members of the Texas Pharmacy and Medical Boards, as well as the Director of the DPS, recommended that the PDMP be moved to the Texas State Board of Pharmacy (TSBP). The proposed transition would have taken effect in the fall of 2010 (Texas State Board of Pharmacy, 2009). However, it was recommended that the PDMP remain under DPS authority for fear of interruption during the transition as well as funding issues. Additionally, the PDMP can only be transferred under legislative rule; therefore the transition is not possible without approval by the Texas legislature.

2.15 PHARMACISTS' PERCEPTIONS OF OPIOIDS

Prior research on pharmacists' perceptions toward prescription opioid medication has focused on the availability of the most potent analgesics in the pharmacy inventory

(Greenwald & Narcessian, 1999; Kanner & Portenoy, 1986; Morrison et al., 2000). Kanner and Portenoy (1986) conducted a study of 50 random pharmacies located in The Bronx, NY to determine the availability of C-II opioid analgesics. Thirty-four pharmacies responded, of which 52 percent did not stock any C-II opioids and 36 percent of pharmacies stocked oxycodone in combination with either aspirin or acetaminophen as their most potent analgesic (Kanner & Portenoy, 1986). Ninety-four pharmacies in New York City also responded to the survey and 29 percent did not stock any C-II opioid analgesics and in 25 percent of pharmacies, oxycodone combinations were the strongest analgesics available. Some of the primary reasons cited for low inventories were fear of robbery and low demand. In another study on opioid analgesic inventory, 14 percent of New Jersey pharmacies responding (n = 52) reported fear of robbery and concerns of federal or state legal investigation as reasons for low opioid stock (Greenwald & Narcessian, 1999).

In a study by Morrison et al. (2000), only 49 percent of responding pharmacies in New York City reported having an adequate supply of opioid mediations. The reasons cited for inadequate supply among 176 pharmacies were fear of illicit use (20%) and robbery (19%). The study concluded that pharmacies in predominantly non-white neighborhoods were less likely to have an adequate supply of opioid medication, compared to pharmacies in mostly white (≥80%) neighborhoods (Morrison, et al., 2000).

Although fear of robbery and diversion has been cited in the literature as a primary reason for pharmacies not stocking certain opioids (e.g., C-II analgesics), some studies have not revealed this concern (Joranson & Gilson, 2001; Mayer et al., 2008). Only 51 percent of pharmacists reported an inability to dispense a C-II opioid medication

due to being out of stock in the past two years. Reasons cited for not having adequate stock of opioid analgesics were mainly due to low demand (78%) and drug cost (38%) (Joranson & Gilson, 2001). However, 19 percent reported concerns of robbery, pilfering and abuse as reasons for not stocking certain opioid medications (Joranson & Gilson, 2001). Furthermore, a study by Mayer et al. (2008) showed no major deficiencies in opioid analgesics in a mail survey of outpatient pharmacies in Washington State. This finding may suggest regional variation in pharmacists' perceptions and related fears associated with stocking potent (C-II) opioid analgesics.

2.15.1 Pharmacists' Attitudes Toward and Knowledge about Addiction and Pain Management

Many studies have shown that pharmacists are not knowledgeable about addiction and pain management. This lack of knowledge has been correlated with negative perceptions toward dispensing certain opioid medications, especially among prescription orders that pharmacists perceive as having high doses (Joranson & Gilson, 2001; Lafferty, Hunter, & Marsh, 2006; Ponte & Johnson-Tribino, 2007). In a mail survey of pharmacists' attitudes toward dispensing opioids for cancer pain (i.e., prescription for 300 morphine tablets), 64 percent opted to not dispense if they were unfamiliar with the patient (Bressler, Geraci, & Feinberg, 1995). Almost 30 percent opted not to dispense the prescription even if they were a regular patient. In addition, pharmacists were apprehensive about dispensing opioids from physicians that used the telephone to call in prescriptions. In the same study, 33 percent of pharmacists felt that a cancer patient taking morphine 150mg every 12 hours was dosed too high and 79 percent believed it would eventually lead to addiction (Bressler, Geraci, & Feinberg, 1995).

In a study of community pharmacists' perspectives on pain, 36 percent believed that patients will likely become addicted to opioids if taken regularly for at least one month (Greenwald & Narcessian, 1999). In a study by Joranson and Gilson (2001), 64 percent of pharmacists believed that it would be appropriate to dispense opioids to a cancer patient with a prior history of abuse. Only 57 percent of pharmacists were confident that dispensing opioids for chronic nonmalignant pain was appropriate. Thirty-five percent of pharmacists believed that to dispense opioids for nonmalignant pain for more than four to five months was inappropriate and warranted legal action (Joranson & Gilson, 2001). Another study showed 54.7 percent of pharmacists were confident in their knowledge regarding proper dosing of opioids and almost half (47.0%) expressed willingness to intervene in situations involving patient addiction (Lafferty, Hunter, & Marsh, 2006). However, less than one-third recognized accepted practice guidelines concerning patients with addictive behaviors (Lafferty, Hunter, & Marsh, 2006).

Many pharmacists incorrectly assume that it is illegal or inappropriate to treat patients with substance abuse histories with opioids (Greenwald & Narcessian, 1999; Lafferty, Hunter, & Marsh, 2006). Almost half (46.9%) of pharmacists in the study reported, never to rarely providing interventional counseling to patients exhibiting addictive behaviors related to opioid analgesics. Ponte and Johnson-Tribino (2007), reported that 44 percent of pharmacists did not enjoy helping patients being treated for chronic pain and 45 percent perceived more time needed to care for them. Pharmacists in this study reported having the proper training needed to help patients manage pain, but almost 60 to 70 percent did not correctly answer questions regarding dependency and tolerance (Ponte & Johnson-Tribino, 2007). Studies have shown that pharmacists lack

proper training with respect to addiction and pain management (Bollinger, et al., 2005; Lafferty, Hunter, & Marsh, 2006; Ponte & Johnson-Tribino, 2007).

2.15.2 PHARMACISTS' PERCEPTIONS OF PRESCRIPTION DRUG ABUSE

Pharmacists are the gate keepers to prescription medications and are therefore instrumental in their proper use (Wallace, 2006). Therefore, it is necessary to examine pharmacists' perceptions of prescription drug abuse because this will likely influence their decision to stock specific CPDs and ultimately, whether to dispense them. A mail survey of Wisconsin pharmacists revealed that 46 percent reported abuse and diversion of controlled prescription opioids (CPOs) to be a problem within the community in which their pharmacy was located (Joranson & Gilson, 2001). In another study, 72 percent of pharmacists viewed addiction and diversion to be a concern (Greenwald & Narcessian, 1999).

Pharmacists more often believe that patients are responsible for many of the diverted CPDs available in the community (Bollinger, et al., 2005). In a survey of rural Michigan pharmacists (n = 57), the results showed that pharmacists perceived a problem with CPD abuse related to physicians' excessive prescribing behaviors (Koski, 2006). Pharmacists in the study often found that communicating their concerns of misuse to physicians was difficult. Another study revealed that pharmacists (46%) viewed diversion of CPDs to be an issue where they practice (Joranson & Gilson, 2001). Pharmacists have dual responsibility of being both healthcare providers as well as mandate to 'police' (i.e., serving as a check and balance) both patients and doctors with respect to CPDs (Lafferty, Hunter, & Marsh, 2006).

2.15.3 PHARMACISTS' UTILIZATION OF PDMPS

Limited research exists regarding pharmacists' utilization of PDMP data when dispensing CPDs. In a study by Ulbrich et al. (2010), the authors examined factors related to pharmacist registration for PDMP access in Ohio. In states with online PDMP access, it is often necessary to register with an oversight authority to obtain a secure login and password (Blumenschein K, 2010). The study revealed that pharmacists who did not register indicated that time for report retrieval was too long. Other reasons for not being registered were no internet access where employed as well as lack of time to register for the program (Ulbrich, et al., 2010). The main reasons provided by pharmacists enrolled in the Ohio PDMP were feeling a sense of responsibility to prevent diversion, and they felt the PDMP helped them accomplish this task when dispensing CPDs. Preventing doctor shopping was significantly more important than other reasons provided ($p < 0.001$).

Data from the Tennessee Controlled Substance Database Report showed that in 2010, there were 1,200,435 data reports requested. Pharmacists requested only 146,101(12.2%) of all reports in that year (Controlled Substance Database Advisory Committee, 2011). In Virginia, over 300,000 PDMP data reports were requested in 2010 of which only 7.6 percent came from pharmacists (Commonwealth of Virginia Department of Health Professions, 2010). Data from KASPER showed that in the prior 30 days, the number of PDMP reports requested by pharmacists was significantly ($p < 0.001$) lower than physicians (mean ±SD; 2.7 (±6.7) vs. 19.7 (±57.8), respectively) (Blumenschein, K., et al., 2010). Twenty-nine percent of respondent pharmacists indicated that KASPER data validated their dispensing of a CPD and 34 percent reported

that reviewing the data changed their decision to dispense. Kentucky pharmacists (92.9%) viewed KASPER as an effective way to prevent prescription drug abuse and diversion. However, physicians in the same study were almost twice as likely to view KASPER as an effective way to prevent abuse and diversion, compared to pharmacists (OR = 1.75, 95% CI=1.03-3.03) (Blumenschein, K., et al., 2010). In a recent study by Fleming et al. (2011), the results also indicated the pharmacists' rates of PDMP reports were lower than physicians' rates with a median 190 vs. 819 per 100,000 population, respectively.

In Maine, pharmacists were surveyed regarding PDPM registration and also asked to provide feedback on ways to improve the system after a software update in 2009 (Sorg, 2009). At the time of the study only 13 percent of pharmacists were registered for PDMP access. Of the 203 respondent pharmacists 128 were not registered with the PDMP. Sixty-three percent reported never attempting to register, 22.6 percent reported no internet at their pharmacy and 14.1 percent were unsure of how to use the PDMP. The results of the aforementioned studies underscore the need for awareness and education of pharmacists related to PDMP registration and utilization.

2.16 INCONSISTENCIES IN THE LITERATURE

Inconsistencies in the literature exist primarily because there is no uniform system for monitoring prescription medications (Wang & Christo, 2009). If NASPER becomes fully operational, perhaps more definitive answers regarding the effectiveness of PDMPs can be obtained. Federal law enforcement agencies are major proponents of PDMPs and continually promote their effectiveness (United States General Accounting Office, 2002).

Many physicians, especially those involved with pain management, feel that many monitoring programs are too restrictive (Alliance of States with Prescription Monitoring Programs, 1999). To date, few studies specifically focus on pharmacists and their involvement with PDMPs.

2.17 SUMMARY

Prescription drug abuse has been a concern for law enforcement and public health officials since the early 1900's (Fishman, et al., 2004). Earlier forms of monitoring used MCPPs to regulate dispensing and guard against prescription forgery (Fishman, et al., 2004; Simoni-Wastila & Tompkins, 2001). However, it has been largely recognized that the use of MCPPs involves substantial administrative burden, and serves as a constant reminder to physicians that they are being watched (Joranson, Gilson, et al., 2002; Simoni-Wastila & Tompkins, 2001).

The "new era" of prescription monitoring is facilitated through electronic databases containing patients' records of all CPDs dispensed by community pharmacies (Kentucky All Schedule Prescription Electronic Reporting [KASPER], 2006; Manchikanti, Whitfield, & Pallone, 2005). The goal of the electronic monitoring is to allow physicians and pharmacists access to this data for the purposes of making clinical decisions regarding either prescribing or dispensing of a CPD (Katz, et al., 2008; Wang & Christo, 2009). The goal of this study is to provide insight into this subject, regarding pharmacists and their intentions to utilize the online database as an aid when dispensing CPDs, particularly when the validity of the prescription/patient need is in question.

CHAPTER THREE: THEORY

3.1 STUDY RATIONALE

Prescription drug abuse and misuse is a significant public health concern (Manchikanti et al., 2010). Additionally, morbidity and mortality associated with prescription misuse has escalated in the past two decades (Paulozzi & Ryan, 2006; Warner, Chen, & Makuc, 2009). Controlled prescription drugs (CPDs) have become the chosen method of many addicts to obtain their drug high and fuel their addiction (McCabe, S. E. et al., 2005; Rigg & Ibanez, 2010). This addiction and increased demand for CPDs among abusers and street users of illicit drugs have placed pharmacists and their staff in harm's way. Reports of burglaries and robberies of pharmacies have increased in the past decade (Brushwood & Kimberlin, 2004). In some regions of the country, drugs from wholesalers must be delivered via armored courier to prevent theft and diversion (Bollinger, et al., 2005). Moreover, some unscrupulous physicians are compounding the problems associated with CPD abuse by accepting cash payments for prescriptions for the most commonly abused drugs. When taking in the complexities of this issue, it is necessary to understand how pharmacists' actions and behaviors can either contribute to or mitigate prescription drug misuse.

Prescription drug monitoring programs (PDMPs) have been in existence since 1940. Contemporary PDMPs have electronically downloaded records that can be readily accessed via online websites by prescribers, pharmacists and law enforcement agencies to help prevent abuse and diversion of CPDs. Pharmacists represent the last line of defense with respect to protecting the public from exposure to illicit or harmful medication use.

Pharmacists are responsible for ensuring that patients receive the appropriate therapy (Wallace, 2006). From drug interactions to overutilization of dangerous drugs, pharmacists have been held liable for ensuring that the prescriber has made the appropriate therapeutic decision that does not cause the patient harm (Lien & Lien, 1994). In nineteen states, the law explicitly states that prescribers are not responsible for checking a patient's CPD history, prior to prescribing (National Alliance for Model State Drug Laws, 2010). This undoubtedly places the burden on pharmacists to access PDMP data if concerns exist regarding the appropriateness of the prescription.

Moreover, PDMPs have been reported to be effective in reducing doctor shopping in some states (Alliance of States with Prescription Monitoring Programs, 2007; Blumenschein, K., et al., 2010). However, utilization by pharmacists is still relatively low, even in leading PDMP states like Kentucky (Blumenschein, K., et al., 2010). No known study has specifically addressed the beliefs, attitudes, subjective norms, perceived behavioral control and intentions of pharmacists related to PDMPs. This study will contribute to the literature by assessing the primary factors associated with pharmacists' intention to utilize PDMP data when dispensing CPDs. Understanding pharmacists' intentions to utilize PDMP data is necessary for the development of continuing education training and college of pharmacy curricula focused on improving utilization.

Many behavioral theories and models have been used to predict and explain behaviors related to health (Glanz, Rimer, & Viswanath, 2008). The theory of planned behavior (TPB), which is an extension of the theory of reasoned action (TRA), will serve as the theoretical framework for this study. TPB was originally proposed by Ajzen and Fishbein (1985) and it has been used to explain the behavioral intention of not only

patients, but health care practitioners (i.e., pharmacists and physicians) (Gaither et al., 1996; Lambert et al., 1997; Nwokeji, et al., 2007; Pradel, Obeidat, & Tsoukleris, 2007). TPB has been used to examine pharmacists' intentions to prescribe antibiotics, counsel patients on asthma, as well as report adverse events to the Food and Drug Administration (FDA) (Gavaza et al.; Pradel, Obeidat, & Tsoukleris, 2007; Saengcharoen et al., 2008). Based on the results of previous research which employed behavioral models, using the TPB to examine pharmacists' intention to utilize PDMP when dispensing CPDs, may be applicable. Using the TPB can provide some insight into pharmacists' beliefs regarding PDMPs and highlight factors that could be targeted for interventions to increase utilization. Because the TPB was derived from the TRA, the next section provides a brief description of the TRA theoretical constructs.

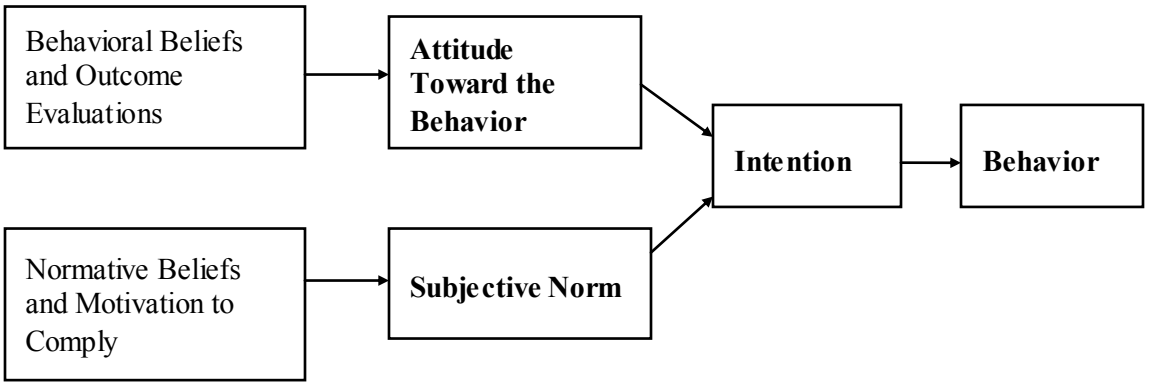
3.2 THEORY OF REASONED ACTION (TRA)

The theory of reasoned action (TRA) purports that people behave in a reasonable manner based on their underlying beliefs regarding the target behavior, when the behavior is under their volitional control (Ajzen & Fishbein, 1980). The TRA assumes that if people evaluate a behavior in a positive manner and if they believe important others will view the behavior in a positive manner, they will have the intention to perform that behavior (Ajzen, 1985; Fishbein & Ajzen, 1975). Figure 3.1 shows that intention is comprised of two determinants, attitude toward the behavior and subjective norm regarding that behavior (Fishbein & Ajzen, 1975). Attitudes are composed of a person's beliefs about the consequences of their behavior and outcome evaluation of that behavior (e.g., bad/good) (Ajzen, 1985; Francis et al., 2004). Subjective norms are composed of a person's beliefs regarding how important others would want them to behave and their

outcome evaluations of that belief (e.g., important/unimportant) (Ajzen, 1985; Francis, et al., 2004). Based on the TRA, a person's intention to perform a behavior is an antecedent to that action (Ajzen, 1985).

TRA has been used to predict intention and examine underlying beliefs across a spectrum of behaviors (Ajzen & Fishbein, 1980; Conner & Norman, 1996; Sheppard, Hartwick, & Warshaw, 1988). A meta-analysis was conducted by Sheppard and colleagues to assess the predictive utility of TRA (Sheppard, Hartwick, & Warshaw, 1988). The results indicated that the intention to behavior relationship in the model was significantly correlated ($r = 0.53$, $p < 0.01$), as was the combined attitude and subjective norm with intention ($r = 0.66$, $p < 0.001$). Both of these results supported the predictive utility of TRA (Sheppard, Hartwick, & Warshaw, 1988).

Figure 3.1 Theory of Reasoned Action



Source: (Ajzen & Madden, 1986)

3.2.1 ATTITUDE

Attitude is one of the primary determinants of a person's behavioral intention (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). However, to understand attitude formation, it is necessary to understand the determinants of attitude. Attitude is in part

derived from a person's salient beliefs about an object or behavior (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). As a general rule of thumb, it is recommended to determine salient beliefs of the target population. Salient beliefs are typically at the foremost of the thought process when asked about a given object or behavior, where the first five to nine belief responses would be considered salient. It is necessary to elicit salient beliefs of behaviors in the proper context, as well as corresponding action, target and time element (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). If questions are not specific regarding the behavior, the responses may not accurately reflect intention and subsequent behavior. For example, if asking about buying a new car, the time frame should be specified; buying a new car in the next month may be very different from buying a new car two years from now. The second component regarding the development of attitude is the person's belief strength or evaluation of their salient beliefs (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The model states that a person's attitude (*A*) can be estimated by measuring his/her beliefs (*b*) about a behavior leading to an outcome (*i*) multiplied by the evaluation (*e*) of the outcome of performing the behavior (Ajzen, 1985). The equation for attitude is represented below.

$A = \Sigma\, b_i e_i$

In brief, a person's attitude toward a behavior is based on their favorable or unfavorable evaluation of the consequences of performing the behavior of interest (Ajzen & Madden, 1986).

Measuring Attitude

Attitude is one determinant in the model used to predict behavioral intention (Ajzen & Fishbein, 1980; Schifter & Ajzen, 1985). Direct (i.e., global) measures of attitude can be used when the goal of the research is to predict variance in behavioral intention (Francis, et al., 2004). If the research is conducted to identify specific beliefs involved with the model constructs (i.e., attitude and subjective norm) then it necessary to measure attitude directly and indirectly (Francis, et al., 2004).

Direct measurement involves personal evaluations of the behavior of interest and is typically measured using semantic differential on 5-point or 7-point scales, either unipolar from (1 to 7) or bipolar (-3 to +3). Below is a representation of a sample question used to measure attitude using a unipolar scale anchored by bipolar adjectives (e.g., pleasant to unpleasant):

For me to buy a new car in the next month is

Attitude (*A*)

good	1	2	3	4	5	6	7	***bad***
harmful	1	2	3	4	5	6	7	***beneficial***
pleasant	1	2	3	4	5	6	7	***unpleasant***

It is recommended to use negatively coded endpoints to counteract possible response biases (Ajzen, 2006; Francis, et al., 2004). The calculated mean item score is then used to represent the overall attitude score (Ajzen & Fishbein, 1980; Ajzen & Madden, 1986).

Indirect measurement of attitude is determined by beliefs that must be elicited from a pilot study (e.g., focus group) and evaluations based on the perceived outcome of each belief in question. Opened ended questions are used to construct a list of modal salient beliefs, which represent the most frequently mentioned beliefs in the research population of interest (Ajzen, 2006; Ajzen & Fishbein, 1980). The number of beliefs selected for the questionnaire should represent at least 75 percent of the beliefs elicited from the pilot study. The following is an example of an advantage listed for buying a new car in the next month. And the outcome evaluation question is asked in correspondence with each belief listed in the questionnaire.

My buying a new car in the next month will lower my concern of a breakdown

Behavioral belief strength (b)

unlikely	-3	-2	-1	0	1	2	3	***likely***

Outcome evaluation (e)

Lowering my concern of a car breakdown is

extremely bad	-3	-2	-1	0	1	2	3	***extremely good***

Calculating Indirect Measures of Attitudes

The behavioral beliefs and outcome evaluations for each belief question provide information to gauge the attitudes associated with a person's intention and subsequent behavior (Ajzen & Fishbein, 1980). This computed attitude uses the expectancy-value model, which is symbolically represented by the equation $A = \Sigma\, b_i e_i$, where (b) is the belief strength multiplied by each respective outcome evaluation (e) (Fishbein & Ajzen,

1975). Table 3.1 illustrates how indirect measures would be calculated and interpreted for attitude, using the hypothetical situation where a person is asked about purchasing a new car in the next month. The consequences of the new car purchase could result in the consequences listed under behavioral beliefs.

Table 3.1 Attitude Scoring Based on Belief and Evaluation ($A = \Sigma b_i e_i$)

Behavioral beliefs	b_i ***(Buying a new car in the next month will result in 'Belief')*** -3 "unlikely" to +3 "likely"	e_i ***('Belief' is…)*** -3 "bad" to +3 "good"	Product of b_i x e_i
Better gas mileage	+3	+3	**+9**
Monthly car note	+3	0	**0**
Increases in car insurance premium	+2	-3	**-6**
Summation of $b_i e_i$ =			**+3**

Since there are 3 items, the possible range of total scores is (3x ±3) x 3 = - 27 to +27
The attitude score reflects a weak positive attitude towards buying a new car.

3.2.2 SUBJECTIVE NORM

A person's subjective norm (*SN*) about performing a behavior is the final component of TRA (Ajzen & Fishbein, 1980). It represents the social pressure a person feels from others to perform the behavior of interest. The subjective norm is similar to attitude, but instead of being determined by behavioral beliefs, it is determined by normative beliefs (*n*). Normative beliefs include what the respondent thinks regarding how important referent persons or groups would view the behavior in question. Subjective norm could be viewed as the social pressure a person perceives regarding the behavior in question (Ajzen & Madden, 1986). Once the important referents have been identified, similar to attitudes, there must be some evaluative component to determine the

strength of the normative belief. In the case of subjective norm, the person's motivation to comply (*m*) with each identified referent is measured by asking. "*How much do you want to do what the referent (e.g., spouse) believes you should do?*" Motivation to comply allows for the most important referents to represent proportionally more influence on the subjective norm (Ajzen & Fishbein, 1980). The relationships between the determinants of subjective norm are expressed below by $\boldsymbol{SN = \Sigma\, n_i m_i}$.

Measuring Subjective Norm

Similar to attitude, s*ubjective norm* uses both direct and indirect measures to predict and explain intention (Ajzen & Fishbein, 1980; Conner & Norman, 1996).

Direct measurement of subjective norm questions should be worded to evaluate the person's subjective judgment of what important people would want regarding the performance of the behavior (Conner & Norman, 1996; Francis, et al., 2004). Subjective norm is typically measured on 5-point or 7-point semantic differential scales, either unipolar from (1 to 7) or bipolar (-3 to +3). Below is a representation of a sample question used to measure subjective norm.

Subjective norm (SN)

Most people that are important to me think that

I should not	1	2	3	4	5	6	7	***I should***

buy a new car in the next month.

It is recommended to use several questions consisting of both injunctive quality and descriptive norms. The injunctive quality corresponds to the premise of subjective

norm (e.g., what important others think about performing the behavior) and the descriptive norm is used to assess what the important others actually do (e.g., quit smoking or continue to smoke) regarding the behavior in question (Ajzen, 2006; Francis, et al., 2004). The calculated mean item score is then used to represent the overall subjective norm score (Ajzen, 2006; Francis, et al., 2004).

Indirect measurement of subjective norm is based on normative beliefs that must be elicited from a pilot study (e.g., focus group) in reference to the important referents regarding the behavior in question (Ajzen & Fishbein, 1980; Conner & Norman, 1996). A normative belief is the persons' belief about what important referents think she/he should or should not do concerning the behavior (Ajzen & Fishbein, 1980; Conner & Norman, 1996). Motivation to comply represents the person's willingness to do what the referent thinks she/he should do. The following is an example of a referent identified from a hypothetical pilot study regarding the behavior of buying a new car in the next month. The example below assumes that a spouse is listed as one of the referents under question.

Normative belief strength (n)

My spouse thinks that

I Should not	-3	-2	-1	0	1	2	3	***I should***

buy a new car in the next month.

Motivation to comply (m)

With regard to buying a new car next month, how much do you want to do what your spouse thinks you should do?

Not at all	-3	-2	-1	0	1	2	3	***Very much***

Calculating Indirect Measures of Subjective Norm

The normative beliefs (n) and motivation to comply (m) for the referent identified provide the information to assess the subjective norm associated with a person's behavioral intention (Ajzen & Fishbein, 1980). This computed subjective norm uses the expectancy-value model, which is symbolically represented by the equation $\mathbf{SN = \Sigma\ n_i m_i}$, where (n) is the normative belief strength multiplied by each respective motivation to comply (m) (Ajzen, 2006; Conner & Norman, 1996). Table 3.2 illustrates how indirect measures would be calculated and interpreted for subjective norm, using the hypothetical situation where a person is asked about purchasing a new car in the next month. The referents identified in the study could be spouse, children and in-laws.

Table 3.2 Subjective Norm Scoring Based on Normative Belief and Motivation to Comply

Referents	n_i ***('Referent' thinks that I*** -3 "should not" to +3 "should" ***buy a car)***	m_i ***(How much do you want to do what 'referent' wants?*** -3 "not at all" to +3 "very much"	Product of n_i x m_i
Spouse	+3	+3	**+9**
Children	+3	+1	**+3**
In-laws	-2	-2	**+4**
Summation of $n_i m_i$ =			**+16**

Since there are 3 items, the possible range of total scores is (3x ±3) x 3 = - 27 to +27

The subjective norm score reflects a moderately positive subjective norm toward buying a new car.

3.2.3 BEHAVIORAL INTENTION

According to the TRA, intentions are the immediate determinants of a behavior (Ajzen & Fishbein, 1980). A person's intention (I) to perform a behavior is based on attitude (A) and subjective norm (SN) toward the behavior in question. Attitude and subjective norm are weighted to account for their influence on the behavior in question. The sums of the weighted components are used to predict a person's intention to perform a given behavior. Intention therefore can be represented by the equation $I = w_1A + w_2SN$, where A is the person's attitude toward performing the behavior, SN is a perceived social pressure to perform or not perform the behavior, w_1 and w_2 are the weights associated with the belief strengths of the two determinants of intention (Fishbein & Ajzen, 1981).

Measuring Behavioral Intention

Behavioral intention is assumed to be the immediate antecedent of a person's attempt or willingness to perform a behavior (Ajzen, 1985). Intention can be defined as the subjective probability of how a person plans to perform or not perform a behavior (Conner & Norman, 1996). It is recommend that intention be measured with two to three items that exhibit a high internal consistency (Ajzen, 2006; Francis, et al., 2004). Intention is measured on 5-point or 7-point semantic differential scales, either unipolar (e.g., 1 to 7) or bipolar (e.g., -3 to +3). Below is a representation of sample questions that could be used to measure intention.

I intend to buy a new car in the next month

extremely unlikely	-3	-2	-1	0	1	2	3	***extremely likely***

I will try to buy a new car in the next month

strongly disagree	-3	-2	-1	0	1	2	3	***strongly agree***
I plan on buying a new car in the next month								
definitely true	-3	-2	-1	0	1	2	3	***definitely false***

The calculated mean item score is then used to represent the person's behavioral intention to buy a new car in the next month (Ajzen, 2006; Francis, et al., 2004).

Statistical analyses using the TRA can vary. When conducting multivariate regression analysis, typically direct measures of attitude and subjective norm are used to predict intention (Francis, et al., 2004; Hankins, French, & Horne, 2000). Indirect measures of attitude and subjective norm are used primarily to explain direct measures. Correlation coefficients can be used to test the validity of the indirect measures' representation of the direct measures (Ajzen, 1991; Ajzen & Madden, 1986).

3.2.4 STUDIES USING TRA AMONG HEALTH CARE PROFESSIONALS

The TRA has been used to predict and understand a number of behaviors (Conner & Norman, 1996). The theory has been used extensively to examine the predictive utility of behaviors such as, condom use, exercise and weight loss, consumer behaviors, smoking cessation, alcohol consumption, sexual behaviors, health screening, food choice, and breast self-examination (Ajzen & Fishbein, 1980; Albarracin et al., 2001; Blue, 1995; Conner & Norman, 1996). Millstein (1996) used TRA and the theory of planned behavior (TPB) to measure the intentions of physicians to provide preventive services (e.g., education on sexually transmitted diseases) to their adolescent patients (Millstein, 1996). The study sample consisted of 765 primary care physicians in California. The

multiple regression analysis ($R^2 = 0.39$, $p < 0.0001$) was significant, in addition to the beta weights for both attitude ($\beta = 0.22$, $p < 0.0001$) and subjective norm ($\beta = 0.28$, $p < 0.0001$) (Millstein, 1996).

Gaither et al. (1996) used the TRA to investigate the intentions of physicians to use seven different drug information resources. A questionnaire was administered to 200 physicians of a health maintenance organization (HMO). The 108 respondents reflected positive attitudes ($\beta \geq 0.40$) toward intention to use a drug information resource when prescribing. When asked about using pharmacists as a drug resource, subjective norm was the more prominent determinant of intention ($\beta = 0.31$). When examining intention to use a physician desk reference (PDR) as the drug information resource, attitude and past behavior ($\beta = 0.27$) were significant predictors. The same was true regarding using pharmaceutical manufacturers' literature for reference ($\beta = 0.26$), however subjective norm did not remain a significant predictor in the model once past behavior was added to the model (Gaither, et al., 1996).

A study by Lambert et al., (1997) used the TRA to investigate factors associated with antibiotic prescribing among physicians ($n = 25$) in an HMO. Theory constructs (A, SN and intention) were used to measure physician prescribing of seven different antibiotics. Attitude ($r = 0.41$ to 0.74, $p < 0.05$) and subjective norm ($r = 0.53$ to 0.88, $p < 0.01$) were significantly correlated with intention to prescribe antibiotics (Lambert, et al., 1997). The authors noted that in contrast to other studies that showed more influence of attitudes on intention, their study showed subjective norm exerted more influence on intention. Intentions to prescribe antibiotics were not predictive of the actual prescribing of the seven antibiotics evaluated in the study. The authors speculated that the influence

of a managed care setting may have been the reason that attitudes were less predictive of intention.

Another study involving health care professionals focused on predicting pharmacists' (N=375) communication intention to patients regarding antibiotics and barriers that would hinder the behavior (Coleman, 2003). A modified version of the TRA was used as the study model. Two separate analyses were computed for the following dependent variables: intention to discuss antibiotics and intention to discuss antibiotic resistance. Regarding antibiotic discussion, attitude contributed the most to the variance in the model ($\beta = 0.20$, $p < 0.001$). Other significant predictors in the model were prescriptions written per day ($\beta = -0.17$, $p = 0.001$), hours worked per day ($\beta = 0.12$, $p = 0.023$) and working in a non-chain pharmacy ($\beta = 0.14$, $p = 0.011$). With respect to intention to discuss antibiotic resistance, attitude again contributed the most to model variance ($\beta = 0.26$, $p = < 0.001$), followed by years in practice ($\beta = 0.15$, $p = 0.006$), and non-chain pharmacy ($\beta = 0.11$, $p = 0.048$).

Khanna et al., conducted a study to determine physicians' (N = 583) intention to measure body mass index (BMI) of patients (children and adolescents) in four states. The TRA was used to measure the influence of attitude and subjective norm on intention. The study also evaluated whether determinants of intention differed among family physicians and pediatricians. Intention was strongly correlated with the direct measurement of attitude ($r = 0.66$, $p < 0.01$) and all other TRA variables were significant ($p < 0.01$). Attitude and subjective norm accounted for half of the variance (49.9%) in intention (Khanna, et al., 2009). Pediatricians had higher intentions to measure patients' BMI compared to family practice physicians ($p < 0.01$).

3.2.5 SUMMARY OF THEORY OF REASONED ACTION (TRA)

The above articles highlight the predictive utility of the TRA in health care professionals' (HCPs) behavioral intention. In all five articles detailed in this section, attitude was a significant contributor to the variance in intention. Furthermore, subjective norm was a significant contributor to intention in three of the five studies mentioned. When intention was regressed on attitude and subjective norm, the beta weights ranged from 0.20 to 0.62 and from 0.18 to 0.69, respectively. Together, attitude and subjective norm accounted for between 15 to 58 percent of the variance in HCPs' behavioral intentions. In both the Millstein and Lambert studies, subjective norm contributed more to the proportion of variance in intention (Lambert, et al., 1997; Millstein, 1996). Furthermore, meta-analyses and systematic reviews have confirmed the model's utility in predicting intention when the behaviors are under volitional control (Albarracin, et al., 2001; Blue, 1995; Sheppard, Hartwick, & Warshaw, 1988).

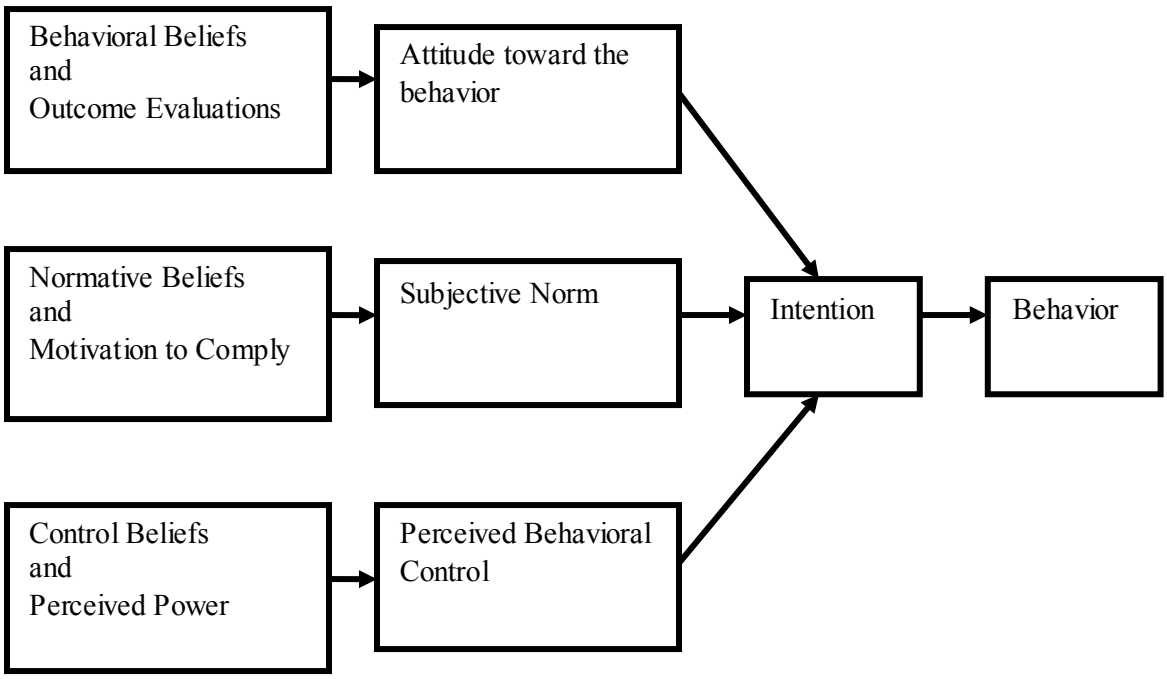
3.3 THEORY OF PLANNED BEHAVIOR (TPB)

In addition to attitude (A) and subjective norm (SN), the theory of planned behavior (TPB) incorporates an additional determinant of intention: perceived behavioral control (PBC). Some of the criticism related to the TRA was based on its limited application to behaviors that are not under a persons' volitional control (Ajzen & Madden, 1986). To account for the influence of volitional control, the TPB was developed as an extension of the TRA (Ajzen, 1991; Ajzen & Madden, 1986). A person's intention to perform a behavior should be representative of the amount of effort one is willing to make (Ajzen, 1991). However, even the most mundane of behavioral intentions, such as brushing your teeth in the morning, can be impeded if your toothpaste

is unavailable. Few human behaviors are under complete volitional control; therefore TPB was developed to compensate for this deficiency in the TRA (Ajzen, 1985; Armitage & Conner, 1999).

As mentioned previously, the TPB adds a component to the model, PBC, which accounts for the person's belief in their volitional control of the target behavior (Ajzen & Madden, 1986). See Table 3.3 for a comparison of TRA and TPB. Volitional control over a behavior requires adequate resources such as time, skills and money (Ajzen, 1985; Ajzen & Madden, 1986). Perceived behavioral control is composed of control beliefs over a behavior and perceived power to carry out a behavior (Ajzen, 1985; Francis, et al., 2004). When a person's attitudes, subjective norms, and perceived behavioral control are favorable toward a behavior, then his or her intention to perform that behavior should be high (Schifter & Ajzen, 1985). Intention is the most immediate determinant of behavior (Ajzen & Fishbein, 1980).

Figure 3.2 The Theory of Planned Behavior



Source: Ajzen, 1991

Table 3.3 Theory of Reasoned Action/Theory of Planned Behavior Determinants

Determinant	Definition
Theory of Reasoned Action	
Attitude	A person's positive or negative evaluation of performing behavior
(1) Behavioral beliefs	Salient beliefs about the consequences of performing behavior
(2) Evaluations	The subjective value associated the outcome of the behavior
Subjective norm	Perceived social pressure of performing or not performing the behavior
(1) Normative beliefs	Beliefs about the likelihood that important referent persons/groups approve or disapprove of the behavior
(2) Motivation to comply	Motivation to perform or not perform behavior based on the perception of how referents would approve
Theory of Planned Behavior (TRA + PBC)	
Perceived Behavioral Control	A persons perception of their ability to perform the behavior
(1) Control belief	Beliefs about the resource or factors that would contribute or impede performing the behavior
(2) Perceived power	The perceived power of each control factor to facilitate or impede the behavior

Source: Ajzen, 1991

3.3.1 PERCEIVED BEHAVIORAL CONTROL

The PBC construct was added to account for circumstances in which the performance of the behavior is outside of the volitional control of the person (Ajzen, 2002). A behavior is considered to be under volitional control if the person can easily perform the behavior (Ajzen & Madden, 1986). PBC may not be an important predictor of intention when a person has limited knowledge of the behavior or when resources are unavailable (Ajzen, 1985). If more opportunities and resources are made available, coupled with limited obstacles to perform a behavior, the individual should increase their perceived control (Ajzen, 1991). PBC is determined by each salient control belief (c) multiplied by the perceived power (p) of facilitating or inhibiting a behavior (Ajzen,

1991; Conner & Norman, 1996). The equation for perceived behavioral control is represented by $\boldsymbol{PBC = \Sigma\, c_i p_i}$.

Measuring Perceived Behavioral Control

Perceived behavioral control (PBC) is the third determinant in the TPB model used to predict behavioral intention (Ajzen & Fishbein, 1980; Schifter & Ajzen, 1985). Like attitude and subjective norm, PBC can be measured both directly and indirectly to assess influence on intention. Direct measurement involves personal evaluations of self-efficacy (*how difficult or easy*) and their beliefs about controllability (*the degree to which a person feels they determine behavior performance*) of the behavior of interest (Ajzen & Madden, 1986). Direct measures are usually measured using semantic differential scales as follows:

Self-efficacy question

I am confident that I can buy a new car next month if I wanted to.

strongly disagree	-3	-2	-1	0	1	2	3	***strongly agree***

Controllability

The decision to buy a new car next month is beyond my control.

strongly disagree	-3	-2	-1	0	1	2	3	***strongly agree***

It is generally recommended that both types of questions be used to measure PBC (Ajzen, 2002; Francis, et al., 2004). The calculated mean item score is then used to represent the

overall PBC score (Francis, et al., 2004). Studies have shown that perceived self-efficacy accounted for more variance in intentions (Ajzen, 2002).

Indirect measurement of PBC is determined by control beliefs (*c*) that must be elicited from a pilot study (e.g., focus group) and perceived power (*p*) to inhibit or facilitate the performance of behavior evaluations based on the perceived outcome of each belief in question (Ajzen, 1991). Opened ended questions are used to construct a list of modal salient beliefs, which represent the most repeatedly mentioned control beliefs in the research population of interest (Ajzen, 1991; Francis, et al., 2004). The following is an example of a control belief (c) and a perceived power (p) question.

Control belief strength (c)

When buying a new car, I am worried about being pressured by the salesman.

unlikely	-3	-2	-1	0	1	2	3	***likely***

Perceived power (p)

When I feel pressured by the new car salesman, I am

less likely	-3	-2	-1	0	1	2	3	***more likely***

to buy a new car next month.

Calculating Indirect Measures of Perceived Behavioral Control

The control belief strength and perceived power (i.e., control belief power) for each control belief question provide information to assess the PBC associated with a person's intention and subsequent behavior (Ajzen, 2006; Francis, et al., 2004). This computed PBC uses the expectancy-value model, which is symbolically represented by the equation $\mathbf{PBC} = \mathbf{\Sigma}\ \mathbf{c_i p_i}$, where (c) is the control belief strength multiplied by each respective perceived power (p) (Ajzen, 2002; Ajzen, 2006). Table 3.4 illustrates how indirect measures would be calculated and interpreted for PBC using the hypothetical purchase of a new car scenario.

Table 3.4 Perceived Behavioral Control (PBC) Based on Control Belief and Perceived Power (PBC = Σ cipi)

Control beliefs about challenges to buying a new car next month	c_i -3 "strongly disagree" to +3 "strongly agree"	p_i -3 "more difficult" to +3 "much easier"	Product of c_i x p_i
I expect to qualify for a low interest rate	Belief strength +1	A low interest rate will make things +3	**+3**
Car dealers are manipulative	Belief strength +2	Feeling manipulated makes it -3	**-6**
Summation of $c_i p_i$ =			**-3**

Since there are 2 items, the possible range of total scores is (3x ±3) x 2 = -18 to +18
The PBC score reflects a low level of negative control toward buying a new car.

3.3.2 STUDIES USING TPB

The TPB model has been utilized by researchers to assess various behaviors. The behaviors range in application such as condom use, exercise behavior, exercise motivation, weight loss, smoking, and sunbathing (Albarracin, et al., 2001; Blue, 1995; Courneya et al., 1999; Harakeh et al., 2004; Hillhouse et al., 1997; Schifter & Ajzen,

1985). The theory has been tested for predictive utility in behaviors that are not considered under the volitional control of the respondents such as exercise and condom use (Armitage & Conner, 2001; Madden, Ellen, & Ajzen, 1992). In a meta-analysis of 185 studies using TPB, the model accounted for 27 percent of the variance in behavior and 39 percent in intention (Armitage & Conner, 2001). However subjective norm (SN) was found to have the smallest influence on intention (Armitage & Conner, 2001; Madden, Ellen, & Ajzen, 1992).

Ajzen (1991) also assessed the TPB utility to predict intention. The results of the 16 studies reviewed found that the three constructs (A, SN and PBC) accounted for a significant amount of variance in intention. The multiple correlations averaged 0.71 (range 0.43 - 0.94). The addition of PBC was shown to improve model prediction of intention, however the average change in R^2 was not provided (Ajzen, 1991). A review was conducted to compare the TRA with TPB with 10 different behaviors (e.g., sleep hygiene, exercise, caffeine use, and renting videos) (Madden, Ellen, & Ajzen, 1992). TPB was found to increase prediction of behavioral intention from 48 percent with TRA (A +SN) to 59 percent with TPB (A + SN + PBC). Furthermore, TPB was shown to explain a larger proportion of the variance in behavior compared to TRA, $R^2 = 0.38$ and $R^2 = 0.28$, respectively (Madden, Ellen, & Ajzen, 1992).

The TPB has been shown to be useful in predicting health-related behaviors (Godin & Kok, 1996). A review of the literature was conducted by Godin and Kok which assessed 56 studies of multiple behaviors: addiction, driving, eating, exercise, oral hygiene, health screening, HIV/AIDS, and clinical screening. Behavioral intention was examined using the TPB in 87 applications in which the results found attitude (A),

subjective norm (SN) and perceived behavioral control (PBC) explained approximately 41 percent of the variance in intention (Godin & Kok, 1996). The variance predicted by TPB ranged from 32 percent (eating disorders) to 47 percent (oral hygiene). PBC was a significant predictor of intention, accounting for 13 percent of additional variance in intention. The researchers concluded that TPB (e.g., addition of PBC) was significant in contributing to the prediction of health-related behaviors (Godin & Kok, 1996).

3.3.3 STUDIES USING TPB TO EXAMINE PHARMACISTS' INTENTIONS

The TPB has been used to predict intention in behaviors associated with pharmacy practice, such as providing pharmaceutical care and medication therapy management (Odedina et al., 1997; Urmie, Farris, & Herbert, 2007) and to explain factors related to pharmacists' behaviors (Gavaza, et al.; Herbert et al., 2006; Mashburn et al., 2003; Odedina, et al., 1997; Pradel, Obeidat, & Tsoukleris, 2007). In one study, the TPB was used to assess pharmacists' behavior towards providing pharmaceutical care (Odedina, et al., 1997). Community pharmacists (n = 617) in Florida were surveyed on the TPB constructs, as well as past behavior, self-efficacy and instrumental beliefs. One of the study hypotheses was to determine if PBC would better predict behavioral intention (BI) than the TRA. The results showed that PBC significantly added to the prediction of intention above TRA and that it was significantly ($p < 0.001$) correlated ($r = 0.54$) with behavioral intention. The TRA multiple regression explained 38 percent of the variance in the model. By adding PBC, the model's explanatory power increased to 44 percent ($p = 0.001$) (Odedina, et al., 1997). The standardized regression coefficients were used to examine which TPB variables had the most influence on intention to

provide pharmaceutical care. Attitude was the most prominent predictor ($\beta = 0.38$, $p = 0.0001$, followed by PBC ($\beta = 0.29$, $p = 0.0001$) and SN ($\beta = 0.14$, $p = 0.001$).

Another study hypothesis was to examine the impact that PBC would have on behavior, while controlling for intention. The results revealed that intention explained 14 percent of the variance, and when PBC was added, the variance increased to 20 percent (Odedina, et al., 1997). The standardized regression coefficients were 0.23 for behavioral intention ($p = 0.0001$) and 0.29 for PBC ($p = 0.0001$). The study also assessed the model variables to determine their influence on behavior. When behavior was the dependent variable, adjusted R^2 was 0.57, ($p = 0.001$) and the significant ($p < 0.001$) coefficients were PBC ($\beta = 0.13$), BI ($\beta = 0.15$) and past behavior ($\beta = 0.65$) (Odedina, et al., 1997).

Mashburn and colleagues (2003) used TPB to explore Texas community pharmacists' intention (i.e., willingness) to provide sterile syringes to known or suspected intravenous drug users (IDUs). A total of 174 usable mail surveys were returned resulting in a 35.1 percent response rate. The study included the TPB constructs (A, SN, PBC) as well as past recent behavior (PB) (Mashburn, et al., 2003). The results showed that half of the pharmacists held negative attitudes toward providing syringes to known or suspected IDUs. The TPB was a significant model in predicting willingness ($R^2 = 0.735$, $p < 0.001$) and significant predictors were attitude ($\beta = 0.66$, $p = 0.001$) and subjective norm ($\beta = 0.20$, $p = 0.001$). Perceived behavioral control was not significant. However, recent past behavior was significantly related to willingness when entered into the hierarchical multiple regression ($\beta = 0.187$, $p = 0.001$) (Mashburn, et al., 2003).

Following this further, TPB was used to predict Iowa community pharmacists' ($n = 203$) intention to provide Medicare medication therapy management services (MTMS)

and to determine how pharmacists' demographics and practice setting influence intention (Herbert, et al., 2006). Almost 58 percent of the respondents were male, 50.2 percent worked for independent pharmacies, and 71.5 percent had more than 10 years of experience. Regression analysis revealed that attitude, subjective norm and perceived behavioral control were significant predictors of behavioral intention (adjusted R^2 = 0.632, $p < 0.05$). In this study, subjective norm had the most influence on intention (β = 0.41, $p < 0.001$), followed by perceived behavioral control was ($\beta = 0.29$, $p < 0.001$) and attitude ($\beta = 0.19$, $p = 0.002$).

The TPB has also been used to explore the factors that influence community pharmacists' asthma counseling of pediatric patients or their parents (Pradel, Obeidat, & Tsoukleris, 2007). Three hundred eighty-nine Maryland pharmacists were surveyed to assess the TPB constructs, as well as the following three behaviors: counseling about asthma, demonstrating inhaler technique, and observing patient inhaler technique. The majority (79%) were employed by grocery or chain pharmacies. Most pharmacists were in agreement with statements regarding the importance of counseling to children (54%) and parents (68%). In spite of the aforementioned, only 29 percent of pharmacists reported counseling pediatric asthma patients in the past month (n = 97). The multivariate logistic regression found intention to be a significant predictor of counseling. When behavior was the dependent variable, as intention score increased by one unit, the odds of counseling increased almost four times, (OR = 3.95, 95% CI = 2.07-7.57). The significant model predictors of intention were perceived ease of counseling (OR = 1.48, 95% CI = 1.13-1.94); and subjective norm (OR = 1.88, 95% CI = 1.06-3.34). As the scores on perceived ease and subjective norm increased, the intention to counsel

increased 1.5 and 1.9 times, respectively. Some external barriers to counseling were lack of time, placebo inhalers and parents' interest (Pradel, Obeidat, & Tsoukleris, 2007).

A TPB model was used to predict the factors involved with Southern Thai community pharmacists' intention to dispense antibiotics to patients with upper respiratory infections (URIs) (Saengcharoen, et al., 2008). Pharmacists in Thailand are legally allowed to dispense antibiotics to patients without a prescription. A total of 862 pharmacies were surveyed and 656 (78.8%) usable surveys were returned. Females comprised the larger majority of respondents (59.6%) and most had a bachelor's degree (83.2%). The items in the study were measured using a 7-point Likert scale from 1 to 7 (strongly disagree-strongly agree). Most pharmacists were opposed to dispensing antibiotics for URIs (mean±SD = 2.35±1.85) and most believed drug resistance was associated with the behavior (mean±SD = 5.29±1.71). The predictors of intention (A, SN, PBC) were assessed using structural equation modeling (SEM). Attitude was the most influential (path coefficient = 0.89, $p < 0.05$) and followed by subjective norm (path coefficient = 0.07, $p < 0.05$). Perceived behavioral control did not significantly predict intention in this study. The total variance explained by the model was not reported in the study.

Pharmacists' intention to report serious adverse drug events (ADEs) to the Food and Drug Administration (FDA) was studied using the TPB (Gavaza, et al.). The objectives of the study were to determine the influence of the TPB constructs (A, SN, PBC) as well to explore whether additional variables [past recent behavior (PB) and perceived moral obligation (PMO)] added to the prediction of intention. A total of 377 surveys were considered usable (26.4%). The TPB model was useful in predicting

intention. Attitude ($\beta = 0.22$, $p < 0.001$) and subjective norm ($\beta = 0.44$, $p < 0.001$) were found to be significant predictors. Perceived behavioral control ($\beta = 0.03$, $p = 0.526$) was not significant in the prediction of intention (Gavaza, et al.). TPB explained 34 percent of the variance in intention (adjusted $R^2 = 0.335$, $p < 0.001$). With respect to PB, the addition of this variable increased the explained variance in intention from 34 to 35 percent (change in $R^2 = 0.009$, $p = 0.021$). When PMO was added to the model, the variance increased to 37.6 percent (change in $R^2 = 0.036$, $p = < 0.001$). The regression coefficient for PMO was significant ($\beta = 0.24$, $p < 0.001$) (Gavaza, et al.).

3.4 SUMMARY OF TPB STUDIES

Six studies were reviewed that examined the TPB and pharmacists' intentions to perform different practice behaviors. The TPB was shown to explain a significant amount of model variance ranging from 34 to 63 percent in the four studies that reported a coefficient of multiple determinations (Gavaza, et al.; Herbert, et al., 2006; Mashburn, et al., 2003; Odedina, et al., 1997). Three of the studies reported that pharmacists' attitude was the most important TPB construct associated with intention (Mashburn, et al., 2003; Odedina, et al., 1997; Saengcharoen, et al., 2008). In two of the studies, subjective norm was reported to be the most important construct associated with intention (Gavaza, et al.; Herbert, et al., 2006). In three of the studies, PBC was not significantly associated with intention (Gavaza, et al.; Mashburn, et al., 2003; Saengcharoen, et al., 2008). Although, one study did not report a multiple regression analysis, the three TPB constructs were significantly correlated with intention (Pradel, Obeidat, & Tsoukleris, 2007). Based on prior studies that used the TPB to predict and explain pharmacists'

intention in various practice behaviors, the model may be useful for predicting and explaining pharmacists' intentions to utilize an online PDMP database.

3.5 OTHER POTENTIAL STUDY PREDICTORS OF INTENTION

Moral norms represent an individual's perception of the moral correctness or incorrectness of performing a behavior (Ajzen, 1991). The construct also takes into account the personal feelings of responsibility one may feel toward a behavior. Moral norms or perceived moral obligation (PMO) has been used to predict intention by some researchers (Gorsuch & Ortberg, 1983; Kurland, 1995). Beck and Ajzen (1991) used the PMO construct to study intention of cheating on exams, shoplifting and lying to get out of turning in assignments on time. The inclusion of PMO increased the predictive power of the TPB model, denoted by a statistically significant 3 to 6 percent increase in explained variance.

In behaviors that involve ethical moral dimensions, moral norm may add to the prediction of intention (Ajzen, 1991). The main difference between perceived moral norm (PMO) and subjective norm is that, PMO captures personal moral feelings regarding a behavior (Ajzen, 1991; Conner & Armitage, 1998). For example, the personal moral feelings of a vegetarian may be opposite from household family members (i.e., referents) who still consume meat. In this example, the subjective norm component would not contribute to intention, because the PMO of the vegetarian is not reflected by important referents (Manstead, 2000). Gorsuch and Ortberg (1983) tested the addition of moral norms in four situations (i.e., two moral and two non-moral) to the TRA. In situations where there is moral dilemma, the construct of moral obligation was

significantly correlated with intention (average r = 0.54, p <0.001). However, in non-moral situations, the results were mixed regarding significance (average r = 0.22).

Additionally, in another study nurses were given four scenarios and asked if they would report colleagues (i.e., moral dilemma) for minor errors in patient care or incompetence. To measure moral obligation, nurses were asked "I believe I have a moral obligation to report the health professional (e.g., pharmacist) to my supervisor." The results of the study showed that only attitude and subjective norm were significant predictors of intention (A, $\beta = 0.67$, $p < 0.001$; SN, $\beta = 0.22$, $p < 0.001$) and PBC ($\beta = 0.05$, $p = 0.41$) was not significant. The variance explained by the TPB constructs was 61 percent. After moral obligation (i.e., PMO) was entered, the model variance significantly increased (change in $R^2 = 0.016$, $P < 0.001$). Gavaza et al., also used the PMO variable to determine if its addition would increase the model variance for pharmacists' intention to report serious adverse events to the FDA. PMO increased the variance in intention from 34 percent to 37.6 percent ($p < 0.05$).

3.5.1 PHARMACISTS' PERCEPTION OF PRESCRIPTION DRUG ABUSE

Several studies have examined the perceptions of pharmacists regarding stocking high potency opioid medications (Greenwald & Narcessian, 1999; Kanner & Portenoy, 1986; Morrison, et al., 2000). These studies have shown that pharmacists' perception of prescription drug abuse and diversion is correlated with their willingness to stock certain opioid medications (e.g., methadone). Pharmacists reported not stocking medications due to fear of robbery, diversion, addiction, and legal and regulatory scrutiny (Greenwald & Narcessian, 1999; Joranson & Gilson, 2001; Kanner & Portenoy, 1986). Considering the

reported influence of the perceived issues (e.g., fear of robbery and diversion) associated with pharmacists' stocking of controlled prescription drugs, these issues could affect pharmacists' views associated with utilizing a PDMP. Pharmacists that utilize the PDMP may be more vigilant concerning the prevention of diversion and abuse. Moreover, one study, which examined the factors related to pharmacists' registration for PDMP access, indicated that preventing doctor shopping was the primary factor (Ulbrich, et al., 2010).

3.5.2 Demographics and Pharmacy Practice Characteristics

Some studies using the TPB have included demographics and other external variables in the model to test whether the prediction of intention is improved by their inclusion (Coleman, 2003; Ko et al., 2004; Sable et al., 2006). Additionally, demographic information has been used post hoc for comparing intenders' vs. non-intenders' demographic characteristics (e.g., continuing education) (Nwokeji, et al., 2007; Pradel, Obeidat, & Tsoukleris, 2007). Interestingly, Ajzen does not view the inclusion of such demographic variables as a necessity for the model prediction. Ajzen states that any impact that demographic variables may have on intention should be mediated by attitude and subjective norm (Ajzen & Fishbein, 1980). TPB studies involving pharmacists have included demographics and practice setting but have not found these variables to significantly predict intention (Herbert, et al., 2006; Pradel, Obeidat, & Tsoukleris, 2007). TPB was used to predict pharmacists' intention to provide MTM and pharmacist demographics and practice setting had no influence on intention (Herbert, et al., 2006). In the study by Pradel and colleagues, demographic and practice characteristics were

significantly related to counseling in bivariate analysis, but were nonsignificant in the regression analyses (Pradel, Obeidat, & Tsoukleris, 2007).

In a study by Coleman (2003), pharmacists' communication with consumers regarding antibiotics was examined using the TRA. The study found that when predicting communication about antibiotic resistance, demographic variables contributed 6 percent of the variance (Coleman, 2003). The significant demographic predictors were years of practice ($\beta = 0.15$, $p < 0.006$), hours worked ($\beta = 0.12$, $p = 0.020$), and non-chain pharmacy ($\beta = 0.11$, $p = 0.048$). Another study using TPB to predict intentions to hunt wildlife also found that education was a significant predictor of hunting (e.g., hunters from non-hunters) (Hrubes, Ajzen, & Daigle, 2001). Although there is limited evidence to support the inclusion of external variables in the model (e.g., demographics) examining their influence on beliefs (e.g., behavioral, normative, and control) may help in targeting interventions aimed at improving intentions (Ajzen, 2011).

3.6 THEORETICAL FRAMEWORK

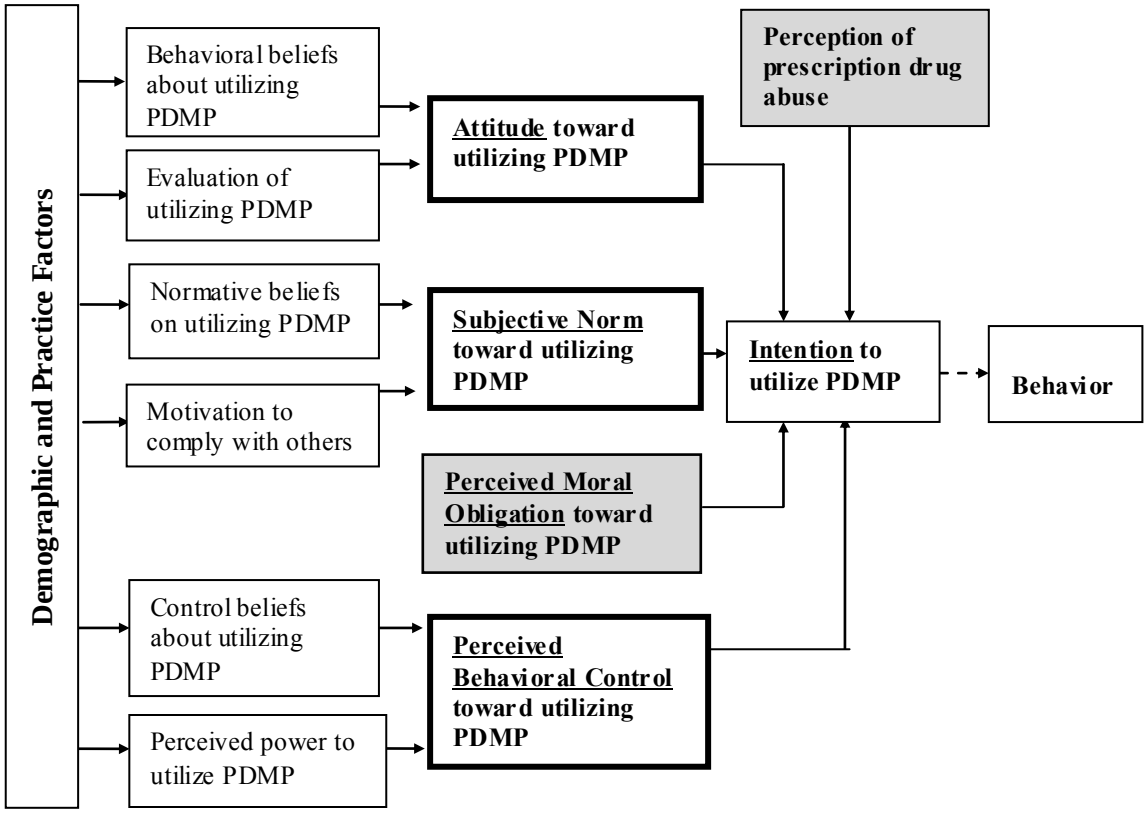
A theoretical model was developed for the specific aims of this study to explain and predict pharmacists' intention to utilize an online database (i.e., PDMP) when dispensing controlled prescription drugs (CPDs), when the validity of the prescription/patient need is in question. The two models most commonly employed to explain and predict health care professionals' intention are the TRA and TPB (Godin et al., 2008; Godin & Kok, 1996). As previously mentioned, most behaviors are not under a person's complete volitional control, and this is particularly applicable to pharmacists. In previous studies, some barriers discussed in relation to intention were lack of time and

patient interest (Pradel, Obeidat, & Tsoukleris, 2007). Based on the TPB's inclusion of the PBC construct, TPB is the most appropriate model to assess pharmacists' intention to utilize a PDMP.

The model for this study is an extension of the TPB (A, SN, PBC) and will include the variables of pharmacists' perception of prescription drug abuse (PPDA), perceived moral obligation (PMO), and demographic and practice factors (e.g., gender, practice setting). PPDA is included into this model based on prior studies that found that fear of robbery and diversion influenced pharmacists' stocking of opioid CPDs (Joranson & Gilson, 2001; Lafferty, Hunter, & Marsh, 2006; Morrison, et al., 2000).

PMO was added to the model due to the nature of the behavior of utilizing a PDMP. A pharmacist has a legal obligation to prevent diversion, but the law allows for subjectivity by admonishing pharmacists to use their "professional judgment" when the decision to dispense a CPD is ambiguous (Drug Enforcement Administration Office of Diversion Control, 2010). PMO has also been shown to improve prediction of intention in pharmacists' reporting of serious ADEs to the FDA (Gavaza, et al.). Other studies have also found significant improvement in the model over the TPB constructs (A, SN, PBC) when including PMO (Gorsuch & Ortberg, 1983; Randall & Gibson, 1991). Additionally, some demographic and practice factors (e.g., years of experience) have been shown to significantly predict health care professionals' intention above the TPB constructs (A, SN, PBC) (Coleman, 2003; Ko, et al., 2004). Figure 3.3 below illustrates the proposed model for this study.

Figure 3.3 Conceptual Model: Using TPB to Predict Pharmacists' Intention to Utilize an Online Prescription Drug Monitoring Program (PDMP) Database



The model posits that pharmacists who have a favorable attitude toward utilizing an online database when dispensing CPDs, have favorable subjective norms, and perceived control over the behavior will have higher intention. The model also depicts pharmacists' perception of prescription drug abuse as having direct influence on intention to utilize the PDMP. Additionally, perceived moral obligation to utilize the PDMP database before dispensing CPDs will have a direct influence on intention.

3.7 STUDY OBJECTIVES AND HYPOTHESES

1. To explore the predictive utility of the TPB constructs (attitude, subjective norm, perceived behavioral control) and the predictive strength of each TPB component in predicting pharmacists' intention to utilize an online prescription drug monitoring (PDMP) database as an aid in their decision making process to dispense controlled prescription drugs when the validity of the prescription/patient need is in question.

H1: Attitude (A), subjective norm (SN) and perceived behavioral control (PBC) will explain a significant amount of variance in the intention to utilize an online PDMP database.

H2: Favorable attitudes (A) will be a positive and significant predictor of intention to utilize an online PDMP database while controlling for SN and PBC.

H3: Subjective norms (SN) supporting the utilization of an online PDMP database will be a positive and significant predictor of intention while controlling for A and PBC.

H4: Strong perceptions of behavioral control (PBC) will be a positive and significant predictor of intention to utilize an online PDMP database while controlling for A and SN.

2. To determine if the perceived behavioral control construct adds to the prediction of community pharmacists' intention to utilize an online PDMP database as an aid in determining whether or not to dispense a controlled prescription drug when the validity of the prescription/patient need is in question beyond that explained by attitude and subjective norm.

H5: The PBC construct will significantly increase the explanatory power of the regression model compared to only including attitude (A) and subjective norm (SN) to explain pharmacists' intention to utilize an online PDMP database.

3. To determine if the pharmacists' perception of prescription drug abuse (PPDA) construct adds to the prediction of community pharmacists' intention to utilize an online PDMP database when the validity of the prescription/patient need is in question beyond that explained by attitude, subjective norm, and perceived behavioral control.

H6: The perception of prescription drug abuse (PPDA) construct will significantly increase the explanatory power of the regression model compared to only including the TPB constructs to explain pharmacists' intention to utilize an online PDMP database.

4. To determine if the pharmacists' perceived moral obligation (PMO) construct adds to the prediction of community pharmacists' intention to utilize an online PDMP database when the validity of the prescription/patient need is in question beyond that explained by attitude, subjective norm, and perceived behavioral control.

H7: The pharmacists' **PMO** construct will significantly increase the explanatory power of the regression model compared to only using the TPB constructs to explain pharmacists' intention to utilize an online PDMP database.

5. To determine if attitude, subjective norm, perceived behavioral control toward utilizing an online prescription monitoring database as an aid in determining whether or

not to dispense a controlled prescription drug when the validity of the prescription/patient need is in question is related to demographic characteristics or practice factors.

H8: There is no difference between male and female pharmacists' A toward utilizing an online prescription monitoring database.

H9: There is no difference between male and female pharmacists' *SN* toward utilizing an online PDMP database.

H10: There is no difference between male and female pharmacists' *PBC* toward utilizing an online prescription monitoring database.

H11: There is no difference in pharmacists' *A* toward utilizing an online prescription monitoring database and pharmacists' experience.

H12: There is no difference in pharmacists' *SN* toward utilizing an online PDMP database and pharmacists' experience.

H13: There is no difference in pharmacists' *PBC* toward utilizing an online PDMP database and pharmacists' experience.

H14: There is no difference in pharmacists' *A* toward utilizing an online PDMP database and pharmacists' primary practice location.

H15: There is no difference in pharmacists' *SN* toward utilizing an online PDMP database and pharmacists' primary practice location.

H16: There is no difference in pharmacists' *PBC* toward utilizing an online PDMP database and pharmacists' primary practice location.

H17: There is no difference in pharmacists' *A* toward utilizing an online PDMP database and pharmacists' race/ethnicity.

H18: There is no difference in pharmacists' *SN* toward utilizing an online PDMP database and pharmacists' race/ethnicity.

H19: There is no difference in pharmacists' *PBC* toward utilizing an online PDMP database and pharmacists' race/ethnicity.

3.8 SUMMARY

The TPB has been used to examine intentions and behavior across a wide array of disciplines. In particular, the TPB has been shown in the literature to be a useful tool for examining the behavior of health care professionals. By examining the determinants of attitudes, subjective norm and perceived behavioral control (when behaviors are not under total volitional control), the theory provides a basis for understanding the beliefs underlying intention. More importantly, the TPB has been shown to have predictive utility in studies of pharmacists' intention. Researchers have also included other variables (e.g., moral norms, demographics) to extend the TPB to improve the variance explained by the model. Therefore, the model will be used to predict and explain pharmacists' intention to utilize an online prescription drug monitoring database when the validity of the prescription/patient need is in question.

CHAPTER FOUR: METHODOLOGY

The goal of this study is to examine Texas community pharmacists' intentions to utilize (query) an electronic medication database (e.g., patient profile) of a patient's controlled substance history (i.e., prescription drug monitoring program) when dispensing CPDs when the validity of the prescription or medical necessity is in question. From this point on the terms *online database* and *prescription drug monitoring program* (PDMP) will be used interchangeably. The theory of planned behavior, as discussed in Chapter Three will be used to address the study objectives. Pharmacists' perception of prescription drug abuse in the pharmacy, perceived moral obligation, practice characteristics and demographics will be assessed as well. The following will detail the study design, instrument development, focus groups, pilot testing, data collection, and data analysis.

4.1 STUDY DESIGN

A non-experimental cross-sectional survey design was employed. A self-report mail survey instrument was used to collect the attitude, subjective norm and perceived behavioral control factors to assess the respondents' behavioral intentions toward PDMP utilization. The Texas State Board of Pharmacy does not provide email addresses of practicing pharmacists. Thus, a mail survey was used for data collection.

4.2 SAMPLE SELECTION

The study population was comprised of licensed Texas community pharmacists practicing in the state as of September 1, 2011. All pharmacists practicing in a community pharmacy are required to maintain knowledge of state laws regarding dispensing prescriptions, in particular, scheduled drugs. This group of pharmacists also has the most patient interaction and is required to make subjective evaluations regarding dispensing controlled prescription drugs (CPDs). The study used the current list of registered pharmacists in Texas. The mailing list for eligible participants was obtained from the Texas State Board of Pharmacy which allows public use of their pharmacist database. It is estimated from past surveys conducted at The University of Texas, which used the State Board database, that a response rate of 30% to 50% can be expected (Brown, Barner, & Shah, 2005; Brown et al., 2007; Griggs & Brown, 2007). The list consists of the name, license status (e.g., active), gender, race, and primary place of employment of all Texas pharmacists.

4.2.1 INCLUSION AND EXCLUSION CRITERIA

Participants eligible for this study were currently practicing Texas community pharmacists as of September 1, 2011. Pharmacists included were those who listed their primary place of pharmacy employment as community independent or chain and those working in ambulatory or outpatient clinics. Pharmacists who listed their primary place of pharmacy employment as hospital, consultant, clinical specialist, academician or other non-direct public (e.g., mail order) patient contact practices were excluded from partici-

pation. Pharmacists whose licenses were on inactive status or those who were retired were also excluded from the study.

4.3 IRB PROCEDURES

This study was conducted within accordance of the guidelines set forth by The University of Texas Institutional Review Board (IRB).

4.4 INSTRUMENT DEVELOPMENT

The survey instrument was developed in accordance with the theory of planned behavior (TPB). The behavioral beliefs, normative beliefs and control beliefs of the target population (i.e., community pharmacists) were elicited from the focus group interviews and the literature. Once the salient beliefs had been identified, a pilot test of the questionnaire was conducted to assess the reliability of the instrument, with regards to the three constructs of attitude (A), subjective norm (SN) and perceived behavioral control (PBC). Feedback acquired from the pilot testing was used to modify the final questionnaire to be administered to the target population.

4.4.1 FOCUS GROUPS

Three focus groups were conducted to facilitate elicitation of the salient beliefs (i.e., behavioral, normative, and control beliefs) associated with the behavior (e.g., utilizing a PDMP) in question. Approximately six to eight pharmacists were recruited for each group and were provided with a $25 honorarium for their participation in the one hour session.

Pharmacists were asked questions to assess their beliefs related to utilizing an online prescription drug monitoring database (PDMP) when dispensing controlled prescription drugs (CPDs) when the validity of the prescription or medical necessity is in question. The focus group was provided with an example of the target behavior of utilizing an online prescription database.

The underlying determinants of attitude towards a behavior were constructed from behavioral beliefs and outcome evaluations of performing the behavior (Ajzen, 1988; Fishbein & Ajzen, 1975). The following open ended questions adapted from Ajzen (2006) were used to elicit information on pharmacists' *behavioral beliefs*:

1. What do you believe are the ***advantages*** of utilizing an online PDMP database when the validity of the prescription/patient need is in question?
2. What do you believe are the ***disadvantages*** to utilizing an online PDMP database when the validity of the prescription/patient need is in question?
3. What else comes to mind when you think about utilizing an online PDMP database when the validity of the prescription/patient need is in question?

The underlying determinants of subjective norm are normative beliefs and motivation to comply. The following open ended questions adapted from (Francis, et al., 2004) were used to elicit information on pharmacists' *normative beliefs*:

1. Are there any individuals or groups who would ***approve*** of your utilizing an online PDMP database when the validity of the prescription/patient need is in question?

2. Are there any individuals or groups who would ***disapprove*** of your utilizing an online PDMP database when the validity of the prescription/patient need is in question?
3. Are there any other individuals or groups who would approve or disapprove of your utilizing an online PDMP database when the validity of the prescription/patient need is in question?

The underlying determinants of the construct of perceived behavioral control are control beliefs and their perceived power to influence. The following open ended questions adapted from Francis, et al., (2004) were used to elicit information on pharmacists' *control beliefs*:

1. What circumstances would ***enable*** you to utilize an online PDMP database when the validity of the prescription/patient need is in question?
2. What circumstances would make it ***difficult*** for you to utilize an online PDMP database when the validity of the prescription/patient need is in question?
3. Are there any other issues that come to mind when you think about utilizing an online PDMP database when the validity of the prescription/patient need is in question?

4.5 STUDY VARIABLES

The dependent and independent variables that were incorporated into the study are detailed in the following sections. The included variables were based on the TPB as outlined by Ajzen (1991): attitude (A), subjective norm (SN), and perceived behavioral control (PBC) and behavioral intention (BI). Additional variables to the TPB are pharmacists' perception of prescription drug abuse (PPDA), perceived moral obligation

(PMO), demographic and practice factors. Figure 3.3 shows the conceptual model for this study.

4.5.1 DEPENDENT VARIABLES

Primary Dependent Variable

The primary dependent variable is behavioral intention and it was used to address objectives one to four (See Section 3.7 for Study Objectives). Specifically, behavioral intention addresses the pharmacists' intention to utilize an online PDMP database when the validity of the prescription/patient need is in question. Intentions are defined by Ajzen (2006) as the immediate precursor of behavior. Intention was measured directly with three items that ask pharmacists about their intention to utilize a PDMP when the validity of the prescription/patient need is in question. The following questions adapted from Ajzen (2006) were used to collect information on pharmacists' intention. Ajzen recommends using three questions that have a high internal consistency with each other. The questionnaire format below was adapted from a previous study that assessed pharmacists' intention to report serious ADEs to the FDA. The authors reported a Cronbach's alpha score of 0.95 (Gavaza, et al.). In the preface to the questionnaire, pharmacists were asked to consider the questions in the context of when the PDMP becomes available for online access.

1. I intend to utilize the PDMP database when the validity of a prescription/patient need is in question.

extremely unlikely	1	2	3	4	5	6	7	***extremely likely***

2. I will try to utilize the PDMP database when the validity of the prescription/patient need is in question.

definitely false	1	2	3	4	5	6	7	***definitely true***

3. I plan on utilizing a PDMP when the validity of the prescription/patient need is in question.

strongly disagree	1	2	3	4	5	6	7	***strongly agree***

These items were measured using a unipolar 7-point semantic differential scale ranging from (1) (e.g., extremely unlikely) to (7) (e.g., extremely likely) (Ajzen, 2006). The total score for intention ranged from 3 to 21 based on the responses given. Scores closer to 21 represent a higher intention. The anchors on question 2 were reversed (1 = more positive; 7 = least positive) and reverse coding was performed prior to summing the items to create the intention score (Ajzen, 2006; Francis, et al., 2004).

Secondary Dependent Variables

The secondary dependent variables were the TPB variables of attitude, subjective norm and perceived behavioral control and they were used to address objective five (See Section 3.7 for Study Objectives). Intentions are based on attitude toward the behavior, subjective norm and perceived behavioral control, where $BI = w_3A_B + w_4SN + w_5PBC$ (Ajzen & Fishbein, 1980; Conner & Norman, 1996). BI is behavioral intention, A is attitude toward the behavior, SN is the subjective norm, PBC is perceived behavioral

control, w_3, w_4 and w_5 represent the weighted importance of each determinant (Ajzen & Fishbein, 1980; Conner & Norman, 1996).

4.5.2 INDEPENDENT VARIABLES

Primary independent variables in the study were based on the TBP. They included pharmacists' attitude, subjective norms, perceived behavioral control, pharmacists' perception of prescription drug abuse, and perceived moral obligation. These variables were derived primarily from the information collected by the focus groups and previous literature.

In the TPB, *direct* (i.e., global) measures of attitude, subjective norm and perceived behavioral control are used to predict intention. The *indirect* measures (i.e., antecedents of TPB constructs), which are based on a persons' beliefs are used to explain intention (Ajzen, 1991). The validity of the *indirect measure* is assessed by correlation with the *direct* measure. Examples of each type of question (*direct* and *indirect*) are provided below.

Attitude

Direct attitude questions assessed the personal evaluations of utilizing a PDMP when the validity of the prescription/patient need for a controlled drug is in question. A 7-point semantic differential scale with +3 to -3 anchors was used. A summary score was created by calculating a mean from the five attitude items based on each respondent's total (Francis, et al., 2004). This score represented the overall attitude measure (i.e., direct), with a total score range from -15 to +15. The following is representative of the type of direct questions that were used in the study.

My utilizing the PDMP database when the validity of the prescription/patient need is in question…

bad	-3	-2	-1	0	1	***2***	3	**good**
inconvenient	-3	-2	***-1***	0	1	2	3	**convenient**
harmful	-3	-2	-1	0	1	2	***3***	**beneficial**
worthless	-3	-2	-1	0	1	2	***3***	**valuable**
unenjoyable	-3	-2	***-1***	0	1	2	3	**enjoyable**

***Direct* attitude (A) score from these items would be = +6**

Indirect measured items were assessed from the beliefs elicited from the focus group discussions. As mentioned in the previous chapter, the behavioral beliefs (*b*) and the corresponding outcome evaluations (*e*), were assessed for each set of modal salient beliefs identified from the focus groups (Ajzen, 1991). A 7-point semantic differential scale with +3 to -3 anchors was used. Each behavioral belief was multiplied by the relevant outcome evaluation and summed to obtain a score for attitude $\boldsymbol{A} = \sum \boldsymbol{b_i}\ \boldsymbol{e_i}$ (Conner & Norman, 1996; Fishbein & Ajzen, 1975; Francis, et al., 2004). Below is a set of questions to assess attitude, adapted from Ajzen (2006) and Francis et al., (2004).

Behavioral belief (b)

My utilizing the PDMP database when I have questions about the validity of a prescription/patient need will prevent diversion from my pharmacy.

b.	***extremely unlikely***	-3	-2	-1	0	1	***2***	3	***extremely likely***

Outcome evaluation (e)

Preventing diversion from my pharmacy is

e.	***extremely bad***	-3	-2	-1	0	1	2	***3***	***extremely good***

Indirect attitude (A) score from these items would be **6**: A = **(b x e);** from above A = **(+2 x +3)** =6.

Subjective Norm

Direct subjective norm questions assessed the person's subjective judgment of important others' views on utilizing a PDMP when the validity of the prescription for controlled medication/patient need is in question. A 7-point semantic differential scale with +3 to -3 anchors was used. A summary score was created by calculating a mean of the items to represent subjective norm (Francis, et al., 2004). The following is representative of the type of direct questions that was used in the study.

Most people who are important to me think that

	I should not	-3	-2	-1	0	1	***2***	3	***I should***

utilize a PDMP when the validity of the prescription for controlled medication/patient need is in question.

The people in my life whose opinions I value

disapprove -3 -2 -1 0 1 ***2*** 3 ***approve***

of my utilizing a PDMP when the validity of the prescription for controlled medication/patient need is in question.

The pharmacists whose opinions I value would

not utilize -3 -2 -1 0 1 ***2*** 3 ***utilize***

a PDMP when the validity of the prescription for controlled medication/patient need is in question.

***Direct* subjective norm (SN) score from these items would be = +6**

Indirect measured items were assessed from the beliefs elicited from the focus group discussions. As mentioned in the previous chapter, the normative beliefs (n) and the corresponding motivation to comply with important others (m), were assessed for each set of modal salient beliefs identified from the focus groups (Ajzen, 1991). A 7-point semantic differential scale with +3 to -3 anchors was used. Each normative belief was multiplied by the relevant motivation to comply and summed to obtain a score for subjective norm $\boldsymbol{SN} = \sum \boldsymbol{nb_j\, mc_j}$ (Conner & Norman, 1996; Fishbein & Ajzen, 1975; Francis, et al., 2004). If a pharmacist views the DEA as an important other, and has a strong motivation to comply with the DEA's tough stance on diversion, then the pharmacist would be more likely to utilize an online prescription database (PDMP). Below is a set of questions to assess subjective norm, adapted from Ajzen (2006) and Francis et al. (2004).

Normative belief strength (n)

The Drug Enforcement Administration (DEA) thinks that

n.	***I should not***	-3	-2	-1	0	1	***2***	3	***I should***

utilize the PDMP database when the validity of the prescription for controlled medication/patient need is in question.

Motivation to comply (m)

When it comes to utilizing the PDMP, how much do you want to do what the DEA wants you to do?

m.	***not at all***	-3	-2	-1	0	1	2	***3***	***very much***

Indirect subjective norm (SN) score from this question would be **6**: SN = **(n x m);** from above SN = **(+2 x +3)** =6.

Perceived Behavioral Control

Direct questions assessed the pharmacist's confidence in utilizing a PDMP when the validity of the prescription/patient need for a controlled drug is in question. A 7-point semantic differential scale with +3 to -3 anchors was used. A summary score was created by calculating a mean for the items to represent the perceived behavioral control (Francis, et al., 2004). The following is representative of the type of direct questions that were used in the study.

Self-efficacy

I am confident that I could utilize a PDMP when the validity of the prescription for controlled medication/patient need is in question.

strongly disagree	-3	-2	-1	0	1	***2***	3	***strongly agree***

For me to utilize a PDMP when the validity of the prescription for controlled medication/patient need is in question would be

difficult	-3	***-2***	-1	0	1	2	3	***easy***

Controllability

The decision to utilize a PDMP when the validity of the prescription for controlled medication/patient need is in question is not entirely up to me.

strongly disagree	-3	-2	-1	0	***1***	2	3	***strongly agree***

***Direct* perceived behavioral control (PBC) score from these items would be = +1.**

Indirect measured items were assessed from the beliefs elicited from the focus group discussions. As mentioned in the previous chapter, the control beliefs (c) and the corresponding perceived power (p) to facilitate the behavior, were assessed for each set of modal salient beliefs identified from the focus groups (Ajzen, 1991). A 7-point semantic differential scale with +3 to -3 anchors was used. Each control belief was multiplied by the relevant perceived power to perform the behavior and summed to obtain a score for perceived behavioral control $\boldsymbol{PBC} = \sum \boldsymbol{c_j p_j}$ (Ajzen, 1991; Ajzen, 2002). If a pharmacist views that the online database is quickly accessible and provides accurate

information about patients, then the pharmacist would be more likely to utilize an online PDMP. Below is a set of questions to assess PBC, adapted from Ajzen (2006) and Francis et al., (2004).

Control belief strength (c)

I expect that I will be too busy filling prescriptions to utilize a PDMP when the validity of the prescription/patient need for a controlled drug is in question.

strongly disagree	-3	***-2***	-1	0	1	2	3	***strongly agree***

Perceived power (p)

Feeling pressure to fill prescriptions quickly would make it

much more difficult	-3	-2	-1	0	1	***2***	3	***much easier***

for me to utilize a PDMP when the validity of the prescription/patient need for a controlled drug is in question.

Indirect perceived behavioral control (PBC) score from this question would be **-4**: PBC= **(c x p);** from above PBC = **(-2 x +2)** = -4.

Pharmacists' Perception of Prescription Drug Abuse

Pharmacists' perception of prescription drug abuse (PPDA) may be an important predictor of intention to utilize an online prescription database. Some pharmacists perceive a problem with physicians overprescribing controlled substances (Koski, 2006). Other pharmacists may refuse to stock controlled substance medications for fear of theft or robbery (Morrison, et al., 2000). In a study assessing West Virginia pharmacists' attitudes on pain medications, 64 percent had apprehension about dispensing large quantities of controlled substance medication (Ponte & Johnson-Tribino, 2007). Based

on these studies, including pharmacists' perception of prescription (e.g., opioids and benzodiazepines) drug abuse in the model may help explain variance in intention to utilize an online prescription database.

Pharmacists' perception of prescription drug abuse was measured by the following five items using 5-point Likert scales. The following items have been adapted from previous surveys of pharmacists regarding drug abuse and diversion (Bollinger, et al., 2005; Koski, 2006).

Q1. Prescription drug diversion is a significant problem in my pharmacy. (1 = strongly disagree to 5 = strongly agree)

Q2. When a patient presents at your pharmacy with a request for a controlled drug, how often do you think it is for purposes of abuse or diversion? (1 = never to 5 = very often)

Q3. How concerned are you about abuse or diversion when a patient requests a brand name controlled drug? (1 = not at all concerned to 5 = very concerned)

Q4. I believe there is a significant problem of physicians overprescribing controlled prescription drugs. (1 = strongly disagree to 5 = strongly agree)

Q5. I believe there is a significant problem of patients abusing controlled prescription drugs. (1 = strongly disagree to 5 = strongly agree)

Perceived Moral Obligation

Pharmacists may feel a sense of moral obligation to ensure that the CPDs they dispense are not being diverted or abused. Therefore, perceived moral obligation (PMO) was assessed to determine its influence on intention. The item was measured using a five-point Likert item response scale anchored by 1 = strongly disagree to 5 = strongly

agree. The following question was used to measure pharmacists' PMO concerning utilizing a PDMP.

Q: I believe that it is my moral obligation to utilize a PDMP when the validity of the prescription for a controlled medication/patient need is in question.

Demographic and Practice Characteristics

The covariates in the study were based on characteristics of the pharmacists participating in the survey that may impact their perception of prescription drug abuse. More importantly, the covariates were used to distinguish characteristics that are related to pharmacists' intention to utilize the controlled substance database to aid in dispensing decisions. These demographic variables included:

- Age (year born);
- Gender (male/female);
- Race/ethnicity (African American/non-Hispanic black, American Indian or Alaska Native, Asian American/Pacific Islander, Caucasian/non-Hispanic white, Mexican American/Hispanic or Other);
- Highest pharmacy degree (B.S. Pharmacy, Pharm.D. M.S. Pharmacy or Residency, Other);
- Years of pharmacy practice (open ended);
- Job title (Staff, Manager/Pharmacists-in-charge, Relief/PRN, Owner, Other);
- Primary practice location (urban, rural or suburban);
- Primary practice site (Community Independent (3 or fewer stores under common ownership) , Community Chain (4 or more stores under common ownership), Grocery Store Chain (e.g., Kroger), Mass Merchandiser (e.g., Walmart), Outpatient/Clinic, other);

  and

- Number of prescriptions filled per day;

4.6 SURVEY PRETEST

After information was compiled from the focus groups, the questionnaire was constructed to assess pharmacists' attitudes, subjective norms and perceived behavioral control and intention. The questionnaire was pretested with at least five pharmacists to ensure content validity and readability of all questions and answers. The five pharmacists were from Austin, Texas, and were currently practicing in community pharmacy. These pharmacists were a collection of colleagues who volunteer to participate in the pretest. The pretest pharmacists were also asked to provide any comments or suggestions that could enhance the questionnaire, such as clarity of questions or important topics omitted. Comments from the pretest group were evaluated and modifications to the survey were incorporated. Modifications included minor changes in the wording of some questions and more importantly, the inclusion of a question on professional obligation.

4.7 DATA COLLECTION

A modified version of the Dillman's tailored design method was employed to maximize the quantity and quality of survey responses. A brief pre-notice postcard was sent to survey respondents a three business days prior to the questionnaire mailing. The pre-notice postcard alerted respondents that a questionnaire was to arrive in a few days to assess their beliefs regarding the Texas controlled substance database. The initial questionnaire mailing contained a personalized cover letter detailing the purpose of the study and the importance of respondents' participation. The cover letter also stressed the anonymity of the study responses. The contents of the envelope contained a self-addressed pre-paid business reply envelope for recipients to return the questionnaire via first-class mail. The questionnaire also offered participants an opportunity to request the aggregate summary of responses.

Respondents were given two weeks to complete and return the initial questionnaire. Three weeks after the initial questionnaire was mailed, a revised cover letter and a second copy of the questionnaire were mailed to encourage non-responders to complete the survey and also to thank the responders who already completed the survey (Dillman, Smyth, & Christian, 2009). Survey recipients were given two weeks from receipt of the follow-up questionnaire to mail it back using the self-addressed pre-paid postage business reply envelope.

4.8 DATA ANALYSES

Descriptive Statistics

Descriptive statistics (frequencies, means, and standard deviations) were performed for all study variables.

Correlation Analyses

Spearman's rho correlations were used to assess the relationships between attitude, subjective norm and perceived behavioral control with pharmacists' years of community practice experience. Bivariate correlations (i.e., Pearson's) were also used to assess the validity of the indirect measures with the direct measures (Ajzen & Fishbein, 1980; Conner & Norman, 1996). Low correlations between indirect and direct measurements may suggest inadequacy of the value-expectancy model or it could be related to measurement (e.g., using unipolar scales with bipolar scales) (Ajzen, 1991). Furthermore, correlations were used to assess the relationships of all model predictor variables with intention. The significance levels for this study were based upon an alpha of 0.05. All analyses in the study were conducted using SAS version 9.2 (SAS Institute, Cary, N.C.).

T-Test Analyses

Independent samples t-tests were used to determine differences in the TPB constructs (A, SN, PBC) based on pharmacists' gender.

Analysis of Variance (ANOVA)

ANOVA was used to assess the differences in mean TPB constructs (A, SN, PBC) for categorical variables which were not dichotomous (e.g., race/ethnicity, and practice location).

Multiple Regression Analyses

Multiple linear regressions were used to assess the relationship between the TPB constructs (A, SN, PBC) and additional variables (PMO, PPDA) with intention serving as the dependent variable. The equation below shows the linear regression model to be used in the study. The TPB constructs were entered simultaneously for each model, except for hierarchical regression analyses discussed below.

$BI = b_0 + b_{1(}A) + b_2\,(SN) + b_3\,(PBC) + b_{4A}\,(PPDA) + b_{4B}\,(PMO) + e_i$

BI = Behavioral intention
A = Attitude
SN = Subjective norm
PBC = Perceived behavioral control
PPDA = Perception of prescription (Rx) drug abuse
PMO = Perceived moral obligation
$b_{1\text{-}5}$ = Unstandardized regression weights
b_0 = Constant
e_i = Error term

Hierarchical Multivariate Regression Analyses

Hierarchical multivariate analyses were used to determine the extent to which additional variables contribute to the set of predictors in step 1 (A+SN = TRA) with the step constituted by the addition of PBC (i.e., A+SN+PBC = TPB). Hierarchical multivariate analyses were also used to assess the additional contribution of PPDA and

PMO, beyond that of the direct measured TPB variables. In these analyses, the TPB constructs (A, SN and PBC) were entered simultaneously and the additional model predictors were entered in step 2 for each predictor.

When using multiple regression analysis, there are assumptions that should be addressed regarding linearity, normality and homoscedasticity of residuals. Linearity refers to the relationship between the independent (predictor) variables and the dependent (outcome) variable. Scatter plots are commonly employed to test for departures from linearity (Tabachnick & Fidell, 2007). Normality can be assessed by statistical analysis or by graphical techniques. In this study normality was assessed by examination of skewness and kurtosis values provided via proc univariate. If data are found to be non-normal, then a transformation is recommended. The assumption of homoscedasticity refers to the standard deviations of residuals around the dependent variable are approximately equal (Tabachnick & Fidell, 2007). This assumption was assessed by scatter plots of the residuals.

Multicollinearity can also be problematic in multiple regression analysis. Multicollinearity results from two predictor variables that are highly correlated with one another, which if undetected can decrease or prevent a predictor variable from reaching statistical significance. As the correlation coefficients approach 0.75, it becomes more problematic due to increased variance in the predictor variables. Tolerance close to zero (0.20) is usually considered problematic. The Variance Inflation Factor (VIF) is the reciprocal of tolerance and it can be used to identify multicollinearity as well (Fox & Monette, 1992). VIF values greater than 10 are usually considered problematic (O'Brien, 2007).

Reliability

Reliability was assessed using an index of internal consistency (e.g., Cronbach's alpha) (Ajzen, 2006; Francis, et al., 2004). Alpha coefficients were assessed for all of the direct measure TPB constructs (A, SN, and PBC), as well as PPDA and PMO. Alpha values greater than 0.6 were considered reliable (Robinson, Shaver, & Wrightsman, 1991). Regarding indirect measures, the internal consistency criterion is not essential because a person may hold both positive and negatives beliefs about the behavior in question (Francis, et al., 2004).

4.8.1 SAMPLE SIZE DETERMINATION

Sample size calculations should be performed a priori to ensure that power is adequate enough to reduce the probability of incorrectly accepting the null hypothesis (Hankins, French, & Horne, 2000). The needed sample size for the study is estimated to be approximately 100 completed surveys. Tabachnick and Fidell (2007) recommend using a ratio of 20 cases for every one predictor variable for hierarchical regression. Based on this calculation, 100 respondents are required for the study to be adequately powered.

To validate the desired a priori sample size needed, the software program, G* Power 3.1.3 was employed. Based on conservative estimates of an effect size of 0.3, alpha = 0.05, beta = 0.95, with five predictor variables to be used in the regression analysis, the needed sample size was estimated to be 72 (Faul et al., 2007). This estimate is conservative because the a priori power was set at 0.80. Based on the above assumptions regarding needed sample size, a minimum of 500 questionnaires were mailed. Prior studies involving surveying pharmacists conducted at The University of

Texas, College of Pharmacy, returned an average response rate of 36.1 percent (Brown, Barner, & Shah, 2005; Brown, et al., 2007; Gavaza, et al.; Griggs & Brown, 2007; Mashburn, et al., 2003). Gavaza and colleagues reported the lowest response rate (26.4%), however, the study had the highest number of mailed surveys (n = 1500). Assuming a response rate as conservative as 26.4 percent, the number of surveys that would need to be obtained are n = 132, and thus would satisfy the a priori determined sample size needed.

4.9 HYPOTHESES STATISTICAL TESTS

The goal of this study was to examine the predictive utility of the theory of planned (TPB) behavior to predict pharmacists' intentions to utilize a PDMP when the validity of a prescription for a controlled drug is in question. Furthermore, the TPB was used to explore the factors related to pharmacists' intention. Table 4.1 provides an outline of the objectives, hypotheses and corresponding statistical tests to be used in the study.

Table 4.1 Study Objectives, Hypotheses and Corresponding Statistical Tests

Objectives/Hypotheses	Dependent Variable	Independent Variable	Statistical Test
Objective 1: To explore the predictive utility of the TPB constructs (attitude, subjective norm, perceived behavioral control) and the predictive strength of each TPB component in predicting pharmacists' intention to utilize an online prescription database as an aid in their decision making process when dispensing controlled prescription drugs when the validity of the prescription/patient need is in question.			
H1: Attitude (A), subjective norm (SN) and perceived behavioral control (PBC) will explain a significant amount of variance in the intention to utilize an online PDMP database.	Intention	Direct measures of: ***A***, ***SN*** and ***PBC*** Indirect measures of: ***A (b x e)*** ***SN (n x m)*** ***PBC (c x p)***	Direct measures: Multiple regression; R^2, F-test Indirect measures: Multiple regression; R^2, F-test
H2: Favorable attitudes (A) will be a positive and significant predictor of intention to utilize an online PDMP database while controlling for SN and PBC.	Intention		
H3: Subjective norms (SN) supporting the utilization of an online PDMP database will be a positive and significant predictor of intention while controlling for A and PBC .	Intention		
H4: Strong perceptions of behavioral control (PBC) will be a positive and significant predictor of intention to utilize an online PDMP database while controlling for A and SN .	Intention		
Objective 2: To determine if the perceived behavioral control construct adds to the prediction of community pharmacists' intention to utilize an online prescription monitoring database as an aid in determining whether or not to dispense a controlled prescription drug when the validity of the prescription/patient need is in question beyond that explained by attitude and subjective norm.			
H5: The PBC construct will significantly increase the explanatory power of the regression model compared to only including attitude (A) and subjective norm (SN) to explain pharmacists' intention to utilize an online PDMP database.	Intention	Direct measures of: ***A***, ***SN*** and ***PBC*** Indirect measures of: ***A (b x e)*** ***SN (n x m)*** ***PBC (c x p)***	Direct measures: Hierarchical regression; R^2, F-test Indirect measures: Hierarchical regression; R^2, F-test

A = Attitudes, ***SN*** = Subjective Norm, ***PBC*** = Perceived Behavioral Control, ***b*** = behavioral beliefs, ***e*** = outcome evaluation, ***n*** = normative belief, ***m*** = motivation to comply, c = control belief, p = perceived power, **PPDA** = Perception of Rx drug abuse, **PMO** = Perceived obligation

Table 4.1 Study Objectives, Hypotheses and Corresponding Statistical Tests (Con't)

Objective 3: To determine if the pharmacists' perception of prescription drug abuse (PPDA) adds to the prediction of community pharmacists' intention to utilize an online prescription monitoring database when the validity of the prescription/patient need is in question beyond that explained by attitude, subjective norm, and perceived behavioral control.			
H6: The PPDA construct will significantly increase the explanatory power of the regression model compared to only using the TPB constructs to explain pharmacists' intention to utilize an online PDMP database.	Intention	Direct measures of: ***A***, ***SN, PBC*** **+ PPDA**	Hierarchical regression; R^2, F-test
Objective 4: To determine if pharmacists' perceived moral obligation (PO) adds to the prediction of community pharmacists' intention to utilize a utilize an online prescription monitoring database when the validity of the prescription/patient need is in question beyond that explained by attitude, subjective norm, and perceived behavioral control.			
H7: The pharmacists' PO construct will significantly increase the explanatory power of the regression model compared to only using the TPB constructs to explain pharmacists' intention to utilize an online PDMP database.	Intention	Direct measures of: ***A***, ***SN***, ***PBC*** **+ PO**	Hierarchical regression; R^2, F-test
Objective 5: To determine if attitude, subjective norm, perceived behavioral control toward utilizing an online prescription monitoring database as an aid in determining whether or not to dispense a controlled prescription drug when the validity of the prescription/patient need is in question is related to demographic characteristics or practice factors.			
H8: There is no difference between male and female pharmacists' *A* toward utilizing an online prescription monitoring database.	Direct and Indirect measures of: ***A***	**Gender**	T-test
H9: There is no difference between male and female pharmacists' *SN* toward utilizing an online PDMP database.	Direct and Indirect measures of: ***SN***	**Gender**	T-test
H10: There is no difference between male and female pharmacists' *PBC* toward utilizing an online prescription monitoring database.	Direct and Indirect measures of: ***PBC***	**Gender**	T-test

A **=** Attitudes, ***SN*** = Subjective Norm, ***PBC*** = Perceived Behavioral Control, ***b*** = behavioral beliefs, ***e*** = outcome evaluation, ***n*** = normative belief, ***m*** = motivation to comply, c = control belief, p = perceived power, **PPDA** = Perception of Rx drug abuse, **PMO** = Perceived moral obligation

Table 4.1 Study Objectives, Hypotheses and Corresponding Statistical Tests (Con't)

H11: There is no difference in pharmacists' *A* toward utilizing an online prescription monitoring database and pharmacists' experience..	Direct and Indirect measures of: ***A***	**Year of degree**	Correlation
H12: There is no difference in pharmacists' *SN* toward utilizing an online PDMP database and pharmacists' experience.	Direct and Indirect measures of: ***SN***	**Year of degree**	Correlation
H13: There is no difference in pharmacists' *PBC* toward utilizing an online PDMP database and pharmacists' experience.	Direct and Indirect measures of: ***PBC***	**Year of degree**	Correlation
H14: There is no difference in pharmacists' *A* toward utilizing an online PDMP database and pharmacists' primary practice location.	Direct and Indirect measures of: ***A***	**Practice location (e.g., urban)**	ANOVA
H15: There is no difference in pharmacists' *SN* toward utilizing an online PDMP database and pharmacists' primary practice location.	Direct and Indirect measures of: ***SN***	**Practice location (e.g., urban)**	ANOVA
H16: There is no difference in pharmacists' *PBC* toward utilizing an online PDMP database and pharmacists' primary practice location.	Direct and Indirect measures of: ***PBC***	**Practice location (e.g., urban)**	ANOVA
H17: There is no difference in pharmacists' *A* toward utilizing an online PDMP database and pharmacists' race/ethnicity.	Direct and Indirect measures of: ***A***	**Race/ethnicity**	ANOVA
H18: There is no difference in pharmacists' *SN* toward utilizing an online PDMP database and pharmacists' race/ethnicity.	Direct and Indirect measures of: ***SN***	**Race/ethnicity**	ANOVA
H19: There is no difference in pharmacists' *PBC* toward utilizing an online PDMP database and pharmacists' race/ethnicity.	Direct and Indirect measures of: ***PBC***	**Race/ethnicity**	ANOVA

A = Attitudes, ***SN*** = Subjective Norm, ***PBC*** = Perceived Behavioral Control, ***b*** = behavioral beliefs, ***e*** = outcome evaluation, ***n*** = normative belief, ***m*** = motivation to comply, c = control belief, p = perceived power, **PPDA** = Perception of Rx drug abuse, **PMO** = Perceived moral obligation

4.10 SUMMARY

This chapter served as a guide for the methodological underpinnings that were used to conduct this study. It described the procedures that were employed to develop the TPB questionnaire as outlined by Ajzen (2006) and Francis et al. (2004). Sample questions used during the elicitation phase of the study were provided. The chapter also detailed the variables used in the study, the objectives and hypotheses tested, as well as the statistical tests used to assess statistical significance in the study.

CHAPTER FIVE: RESULTS

This chapter details the results of the study. The theory of planned behavior (TPB) was used as the theoretical framework for the study. The first section describes the results obtained from the focus group sessions. The second section describes the results obtained from the mail questionnaire of Texas community pharmacists. Descriptive statistics will be presented for all study variables. Bivariate statistics involving the theoretical constructs attitude (A), subjective norm (SN), and perceived behavioral control (PBC) will be presented. Additionally, internal consistency of scale items based on the TPB and other predictor variables will be presented. Multivariate analyses will be used to examine the variance explained in intention.

5.1 FOCUS GROUP RESULTS

Three focus group sessions were conducted with a total of 23 Texas community pharmacists for the purpose of eliciting the salient beliefs pharmacists' hold toward utilizing the online component of a prescription drug monitoring program (PDMP) database. The first focus group was conducted in Houston, Texas with nine community pharmacists representing both chain pharmacists and practicing independent pharmacy owners. The second focus group was conducted at The University of Texas at Austin, College of Pharmacy with nine pharmacists with varied backgrounds and experiences in community pharmacy. The third group was conducted in Austin, Texas and was comprised of five chain pharmacists.

Lunch was provided to the pharmacists that participated in the focus group held at The University of Texas. The other two focus groups received a $25 gift card as an incentive for participation. Focus groups were tape recorded and participants provided written responses to the questions found on the focus group moderator guide (see Appendix D). The written responses from the focus groups were content analyzed by two different investigators to determine the common themes and categories regarding pharmacists' beliefs toward PDMP utilization.

The most frequently mentioned beliefs developed from the focus group analysis were used in the questionnaire and they represented pharmacists' modal beliefs. Modal beliefs represent the salient beliefs of the group of interest. To ensure that pharmacists' modal beliefs were included, a minimum frequency of 15 percent agreement among focus group participants (N = 23) was required to be included in the questionnaire.

5.1.1 BEHAVIORAL BELIEFS

A total of 23 behavioral beliefs were identified from the three focus group sessions and nine were deemed salient and included in the final questionnaire (see Table 5.1). The most frequently mentioned behavioral beliefs were utilizing the PDMP would improve appropriate controlled medication therapy (n = 12) and decrease diversion of controlled medication (n = 12). The most frequently mentioned belief deemed a disadvantage of PDMP utilization was related to pharmacists' fear of increased liability, particularly if they denied a prescription based on inaccurate information found in the PDMP database (n = 12). Ajzen and Fishbein's theory of reasoned action suggests that

an individual has five to nine beliefs that he or she holds to be salient (Ajzen & Fishbein, 1980). Based on this information, it was decided to only include the most frequently mentioned five to nine modal salient beliefs, but they had to have been mentioned by a minimum of fifteen percent of the focus group study population to be included in the questionnaire.

Table 5.1 Behavioral Belief Items Based on Responses to Questions 1 to 3 from Focus Group Sessions (N = 23 Pharmacists)

Questions 1: What do you believe are the ***advantages*** of utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

Questions 2: What do you believe are the ***disadvantages*** of utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

Questions 3: What else comes to mind when you think about utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

No.	Responses	Frequency
1	Improve appropriate controlled medication use	12
2	Decrease diversion of controlled medication	12
3	Increase risk of pharmacist liability	12
4	Violate patient privacy (HIPAA)[b]	11
5	Consume too much time to access data	11
6	Decrease doctor shopping	7
7	Deny controlled medication based on inaccurate data in the PDMP[a]	6
8	Decrease pharmacy hopping (i.e., using multiple pharmacies)	5
9	Decrease pharmacy profitability	4
10	Loss of pharmacist license	3
11	Provide pharmacists with a tool to validate suspicious prescriptions or patients	3
12	Prevent abuse	2
13	Scrutiny of pharmacists by Texas Department of Public Safety	2
14	Save pharmacists investigation time if patient is in question	2
15	Increase angry customer incidents	1
16	Lead to an increase in pharmacy break-ins/robberies	1
17	Provide doctors with confidence to prescribe controlled medications	1
18	PDMP[a] becomes a barrier to access	1
19	Help validate doctors' legal authority to prescribe controlled medications	1
20	Backlash from doctor groups	1
21	Provide a false sense of security for pharmacists related to controlled medication dispensing	1
22	Information technology resources needed	1
23	Administrative burden	1

[a]PDMP – Prescription Drug Monitoring Program
[b]HIPAA – Health Insurance Portability and Accountability Act

5.1.2 NORMATIVE BELIEFS

Normative beliefs are the basis for a persons' subjective norm towards a behavior. Modal normative beliefs were obtained from the focus groups by having participants list those important individuals or groups who would either approve or disapprove of PDMP utilization by pharmacists. A total of seven normative beliefs were identified from the focus group sessions (see Table 5.2). The most frequently mentioned salient referents were regulatory agencies such as Texas State Board of Pharmacy (TSBP) and the Drug Enforcement Administration (DEA) (n = 13). The second most frequently mentioned referents were prescribers (n = 12), followed by patients (n = 9).

Table 5.2 Normative Belief Items Based on Responses to Questions 4 to 6 from Focus Group Sessions (N = 23 Pharmacists)

Questions 4: Are there any individuals or groups who would ***approve*** of pharmacists utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

Questions 5: Are there any individuals or groups who would ***disapprove*** of pharmacists utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

Questions 6: Are there any other individuals or groups who would approve or disapprove of your utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

No.	Responses	Frequency
1	Regulatory agencies/law enforcement (i.e.,TSBP, DPS, DEA)[b]	13
2	Prescribers (e.g., MD, NP, PA)[c]	12
3	Patients	9
4	Patient privacy advocates	9
5	Pharmacy owners/employers	8
6	Other pharmacists	6
7	Pharmaceutical manufacturers/wholesalers	4
8	Insurance companies	3
9	Family of overdose victims (e.g., MADD)[d]	3
10	Other medical personnel (e.g., nurses, clinics)	3
11	Drug dealers	3
12	General public (consumers)	3
13	Researchers	1
14	Lawyers	1
15	Street thugs	1
16	Drug kingpins	1
17	Pharmacy and medical groups	1

[a]PDMP – Prescription Drug Monitoring Program
[b]TSBP – Texas State Board of Pharmacy; DPS-Texas Department of Public Safety; DEA-Drug Enforcement Administration
[c]MD – Medical Doctor; NP-Nurse Practitioner; PA- Physician Assistant
[d]MADD – Mothers Against Drunk Driving

5.1.3 CONTROL BELIEFS

Focus group participants were asked to discuss factors they believed would enable them to utilize the online PDMP. A total of 22 different control beliefs were identified from the focus groups analysis. The most commonly cited factor related to PDMP utilization was a PDMP with quick access/fast search results (n = 13). Secondly, pharmacists wanted the PDMP database interfaced with the current pharmacy prescription filling software (n = 12) (see Table 5.3). The most commonly identified barrier or circumstance that would make it difficult was the lack of time to access the database, which was cited by twelve pharmacists.

Eight beliefs met the criteria for inclusion in the questionnaire. The five to nine most salient modal beliefs were used in the questionnaire, based on a minimum frequency of at least 15 percent of pharmacists' reporting the belief from the focus groups. Although the Texas PDMP is not yet online accessible, pharmacists in the focus group were able to discuss the potential enabling factors and barriers they envisioned related to PDMP utilization.

Table 5.3 Control Belief Items Based on Responses to Questions 7 to 9 from Focus Group Sessions (N = 23 Pharmacists)

Questions 7: What circumstances would ***enable*** you to utilize an online PDMP[a] database when the validity of the prescription/patient need is in question?

Questions 8: What circumstances would ***make it difficult*** for you to utilize an online PDMP[a] database when the validity of the prescription/patient need is in question?

Questions 9: Are there any other issues that come to mind when you think about utilizing an online PDMP[a] database when the validity of the prescription/patient need is in question?

No.	Responses	Frequency
1	Quick access/fast search results	13
2	PDMP[a] interfaced/connected to pharmacy prescription filling software	12
3	Lack of time to search PDMP[a] (e.g., workflow issues)	12
4	Accuracy of information	10
5	User friendly website (database)	7
6	Employer support/approval	5
7	Patient retaliation for refusal to dispense controlled medication	5
8	Insurance compensation/reimbursement for querying the PDMP[a]	4
9	No internet or system down	3
10	Clear rules/expectations from DPS/DEA[b]	3
11	Release from liability	3
12	Prescriber checks before prescribing	3
13	Cooperative patients	2
14	Relationship with prescriber	2
15	Remote access	2
16	Printable data	1
17	Patient already in system	1
18	Someone other than patient picking up medication	1
19	Apathetic pharmacists	1
20	Ability to see what other pharmacies are dispensing	1
21	Mandatory use	1
22	Fee to use PDMP[a]	1

[a]PDMP – Prescription Drug Monitoring Program
[b]DPS – Texas Department of Public Safety; DEA – Drug Enforcement Administration

Table 5.4 Theoretical Constructs and Representative Survey Questions

TPB Constructs	Belief Measure	Number of Items	Questionnaire Number
Intention	Intention	3	1a-c
Attitude	Attitude	5	2a-e
Subjective Norm	Subjective Norm	2	3a-b
Perceived Behavioral Control	Perceived Behavioral Control	3	3c-e
Indirect Attitude	Behavioral beliefs X Outcome evaluation	9	15a-i 16a-1
Indirect Subjective Norm	Normative beliefs X Motivation to comply	7	17a-g 18a-g
Indirect Perceived Behavioral Control	Control beliefs X Perceived power	8	19a-h 20a-h

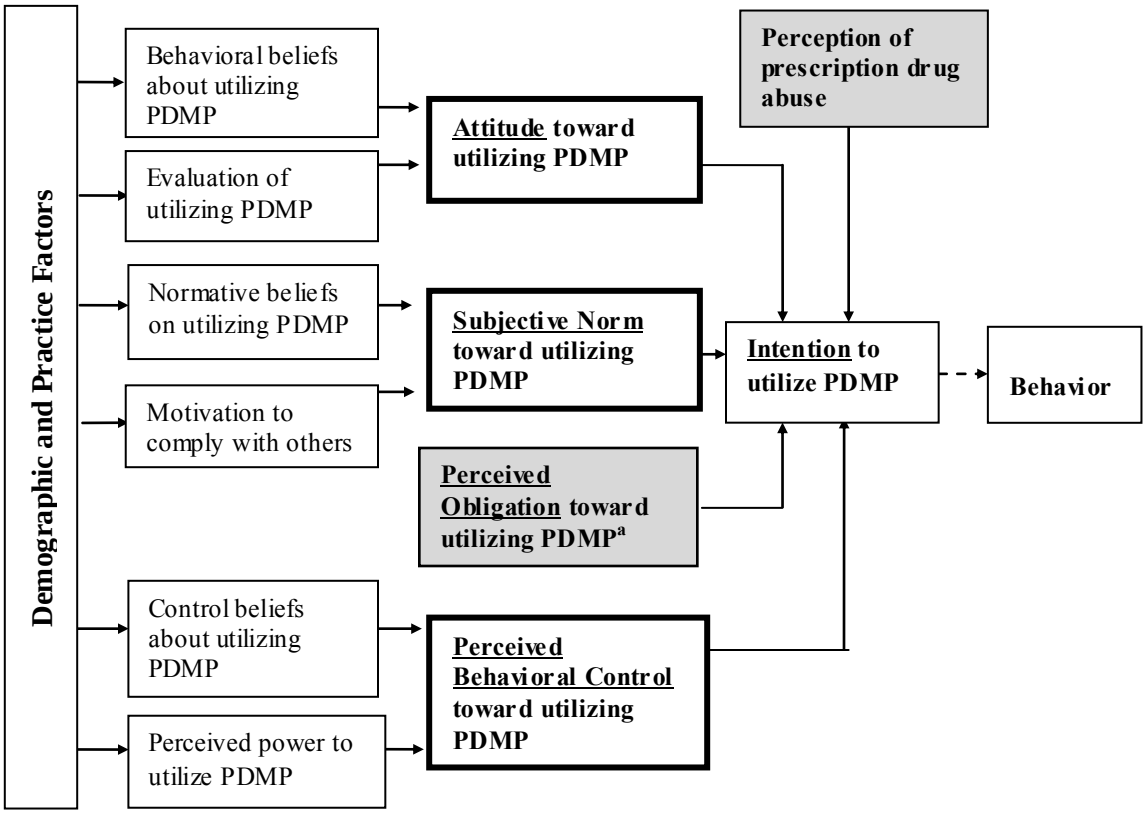
5.2 QUESTIONNAIRE PRETEST

Based on the information obtained from the focus groups and a review of the literature on pharmacists' perception of prescription drug abuse, the questionnaire was constructed. The questionnaire was pretested with eight Austin, Texas area community pharmacists. The questionnaire was further reviewed by the dissertation committee members. The pre-notice postcard and cover letter were also reviewed by committee and pharmacists participating in the survey pretest.

Based on feedback provided by the committee members and pharmacists, several minor changes were made to the cover letter and the questionnaire. The most notable change to the questionnaire was the addition of the question regarding professional obligation. Several pharmacists questioned whether moral obligation (original question) was the same as professional obligation. To avoid confusion pertaining to the original question, both questions were thus included in the final version of the questionnaire. The

change in the questionnaire is also reflected in the study model (see Figure 5.1) where perceived moral obligation is now perceived obligation, which represents the two item construct composed of perceived moral obligation and perceived professional obligation.

Figure 5.1 The Theory of Planned Behavior Extended Model Revised (Study Model)



[a]Changed from perceived moral obligation to perceived obligation based on focus group feedback

5.3 MAIL QUESTIONNAIRE RESPONSE RATE

A mailed questionnaire was sent to a random sample of 998 Texas community pharmacists on February 14, 2012. Two pharmacists were deleted prior to mailing because they did not meet the inclusion criteria for the following reasons: nondispensing of controlled medication, and one member had a conflict of interest. A total of 279 surveys were received for a raw response rate of 28 percent. Eight surveys were deleted for the following reasons: four were not practicing in a community pharmacy (e.g., central fill pharmacist, hospital pharmacist), two did not dispense controlled medications,

two were retired, resulting in 990 presumed delivered to respondents. Ten surveys were deleted for the following reasons, one duplicate and nine were incomplete (i.e., did not answer a sufficient amount of questions related to the TPB). Thus, the number of useable surveys was 261, which resulted in a 26.4% response rate (261/990).

5.4 PHARMACISTS' DEMOGRAPHIC AND PRACTICE CHARACTERISTICS

The demographic and practice characteristics of the respondent pharmacists were compiled and are described below (see Tables 5.5-5.15). Table 5.5 shows the mean age of the sample was 50±13.7 years. The highest percentages of respondents were approximately equal among those 36 to 45 years (25.5%) and 56 to 65 years (25.9%) of age. Male respondents represented 52.1 percent of the study participants (see Table 5.6). As shown in Table 5.7, Caucasian/Non-Hispanic Whites represented the majority of survey respondents (65.8%).

Table 5.5 Mean and Frequency Distribution of Age

Age	N	Percent (%)
25-35	40	15.7
36-45	65	25.5
46-55	48	18.8
56-65	66	25.9
> 65	36	14.1
Total	255[a]	100.0
Mean age (SD): 50.3 (13.7)		

[a]Total does not equal 261 due to missing responses

Table 5.6 Frequency Distribution of Gender

Gender	N	Percent (%)
Males	136	52.1
Females	125	47.9
Total	261	100.0

Table 5.7 Frequency Distribution of Race/Ethnicity

Race/Ethnicity	N	Percent (%)
African American/ Non-Hispanic Black	29	11.3
American Indian Or Alaska Native	3	1.2
Asian American/Pacific Islander	30	11.7
Caucasian/ Non-Hispanic White	169	65.8
Mexican American/Hispanic	26	10.1
Total	257[a]	100.1[b]

[a]Total does not equal 261 due to missing responses
[b]Total percentage does not add up to 100.0 due to rounding error

Table 5.8 details the highest level of pharmacy education. The majority of pharmacists in the study reported receiving a bachelor of pharmacy (70.0%).

Table 5.8 Frequency Distribution of Highest Level of Pharmacy Education

Highest Degree	N	Percent (%)
B.S. Pharmacy	182	70.0
Pharm.D.	75	28.9
M.S. Pharmacy or Residency	2	0.8
Other[a]	1	0.4
Total	260[b]	100.1[c]

[a]Doctor of Philosophy
[b]Total does not equal 261 due to missing responses
[c]Total percentage does not add up to 100.0 due to rounding error

5.4.1 PRACTICE CHARACTERISTICS

Pharmacists in the study were primarily working in community chain pharmacies (40.9%) (see Table 5.9). Pharmacists reported filling an average of 275.2±158.2 prescriptions per day (see Table 5.10), with slightly over one-half (51.0%) filling 151 to 350 prescriptions daily. Table 5.11 shows that most pharmacists reported having internet access in their pharmacy (77.7%).

Table 5.9 Frequency Distribution of Current Pharmacy Practice Settings

Practice Setting	**N**	**%**
Community Independent	55	21.2
Community Chain	106	40.9
Grocery Store Chain	57	22.0
Mass Merchandiser	32	12.4
Outpatient/Clinic Pharmacy	9	3.5
Total	259[a]	100.0

[a]Total does not equal to 261 due to missing responses

Table 5.10 Mean and Frequency of Prescriptions Filled Per Day

Number of Prescriptions	**N**	**Percent (%)**
1-150	65	25.3
151-350	131	51.0
>350	61	23.7
Total	257[a]	100.0
Mean daily prescriptions (SD): 275.2 (158.2)		

[a]Total does not equal to 261 due to missing responses

Table 5.11 Frequency Distribution of Pharmacy Internet Access

Internet Access	N	Percent (%)
Yes	202	77.7
No	49	18.9
Unsure	9	3.5
Total	260[a]	100.1[b]

[a]Total does not equal to 261 due to missing responses
[b]Total percentage does not add up to 100.0 due to rounding error

Table 5.12 shows that an approximately equal number of staff pharmacists (41.3%) and pharmacy managers (41.0%) responded to the questionnaire. Approximately 85 percent of respondent pharmacists worked full time (i.e., greater than or equal to 30 hours per week) (see Table 5.13).

Table 5.12 Frequency Distribution of Pharmacists' Current Position/Title

Current Position/Title	N	Percent (%)
Relief/ PRN (as needed)	27	10.4
Staff	107	41.3
Manager/ Pharmacist-in-Charge	106	41.0
Owner	18	6.9
Other[a]	1	0.4
Total	259[b]	100.0

[a]Other – Resident pharmacist
[b]Total does not equal to 261 due to missing responses

Table 5.13 Frequency Distribution of Employment Status

Employment Status	N	Percent (%)
Full-time (≥30 hours/week)	219	84.6
Part-time (<30 hours/week)	40	15.4
Total	259[a]	100.0

[a]Total does not equal to 261 due to missing responses

Pharmacists reported a mean of 22.3±14.4 years of community pharmacy experience (see Table 5.14). Approximately 40 percent of pharmacists reported working in suburban (42.6%) or urban (39.8%) areas (see Table 5.15).

Table 5.14 Mean and Frequency Distribution of Years of Practice in Community Pharmacy

Years of Practice	N	Percent (%)
1 to 10	62	24.1
11 to 20	68	26.5
21 to 34	65	25.3
≥ 35	62	24.1
Total	257[a]	100.0
Mean years (SD): 22.3 (14.4)		

[a]Total does not equal to 261 due to missing responses

Table 5.15 Frequency Distribution of Pharmacy Practice Location

Pharmacy Location	N	Percent (%)
Rural	45	17.6
Suburban	109	42.6
Urban	102	39.8
Total	256[a]	100.0

[a]Total does not equal to 261 due to missing responses

5.5 NON-THEORY OF PLANNED BEHAVIOR QUESTIONS

Non-theory related questions were asked to ascertain pharmacists' level of training or continuing education in the past five years related to drug abuse/addiction, diversion prevention and pain management. Respondents were asked to report the number of hours received related to the aforementioned training. Most pharmacists (60.9%-62.8%) reported at least 1 to 6 hours of training across all three categories. However, approximately 15 percent of pharmacist reported no training in the past five years related to identifying prescription drug abuse/addiction or diversion prevention (see Table 5.16). A higher proportion of pharmacists had no training or continuing education in drug abuse (15.7%) and diversion (15.3%) compared to pain management (6.1%).

Table 5.16 Pharmacists' Reported Continuing Education in the Past Five Years (N = 261)

Training or Continuing Education	Hours of Training N (%)		
	None	1 to 6	≥ 7
a. Identifying prescription drug abuse/addiction	41 (15.7)	164 (62.8)	56 (21.5)
b. Preventing prescription drug diversion	40 (15.3)	159 (60.9)	62 (23.8)
c. Pain management	16 (6.1)	161 (61.7)	84 (32.2)

Pharmacists were asked about situations or events that would trigger them to utilize the PDMP database (see Table 5.17). The question measured the frequency of the events which would lead to pharmacists' utilization of the PDMP. Almost one-half (48.1%) of pharmacists reported that patients who prefer to pay cash for their prescriptions (i.e., did not want prescription billed to insurance) would always trigger PDMP utilization. Mistakes or irregularities in the prescription and early refill request

would always trigger PDMP utilization among 68.1 percent and 66.3 percent of pharmacists, respectively. Respondents were also allowed to provide open ended responses regarding other situations or events that might trigger PDMP utilization. Pharmacists reported the PDMP would be utilized for patients with multiple controlled medications on one prescription, especially if written for the triple cocktail (e.g., Vicodin®/Norco,® Xanax,® and Soma®). One hundred and eleven comments were recorded for this open ended question.

Table 5.17 Pharmacists' Reported Mean and Frequency Distribution of Events That Would Trigger PDMP Utilization (N = 260)[a]

		Frequency Distribution of Response Choices N (%)				
Events	**Mean (SD)**	**Never** (1)	(2)	**Sometimes** (3)	(4)	**Always** (5)
a. New patient	3.7 (1.1)	8 (3.1)	14 (5.4)	108 (41.5)	49 (18.9)	81 (31.2)
b. Patient prefers to pay cash	4.2 (1.0)	6 (2.3)	8 (3.1)	35 (13.5)	86 (33.1)	125 (48.1)
c. Mistakes or irregularities in the written prescription	4.6 (0.8)	3 (1.2)	3 (1.2)	18 (6.9)	59 (22.7)	177 (68.1)
d. Refill request that is too early	4.6[b] (0.7)	2 (0.8)	1 (0.4)	20 (7.8)	64 (24.8)	171 (66.3)

[a] Total does not equal to 261 due to missing response
[b] Mean calculation based on 259 responses

Pharmacists were surveyed about the frequency of tasks typically associated with dispensing controlled medications (see Table 5.18). Over 47 percent of pharmacists reported always consulting patient records before dispensing a controlled medication (49.2%), validating DEA numbers (47.7%) and verifying patient identification (47.5%).

However, pharmacists reported asking about other controlled medications sometimes (42.7%). Almost 40 percent (39.2%) reported never discussing buprenorphine products with patients/prescribers if opioid addiction was suspected. Thirty-one open-ended responses were recorded for this question. Pharmacists mentioned tasks such as submitting prescriptions to the patient's insurance to determine if the prescription was recently dispensed by another pharmacy.

Table 5.18 Pharmacists' Reported Frequency of Tasks Associated with Dispensing Controlled Prescription Medication (N = 260)[a]

Events	Mean (SD)	Frequency Distribution of Response Choices N (%)				
		Never (1)	(2)	**Sometimes** (3)	(4)	**Always** (5)
a. Consult patient records that you have access to before dispensing the drug	4.3 (0.8)	0 (0.0)	3 (1.2)	44 (16.9)	85 (32.7)	128 (49.2)
b. Validate the prescriber's DEA number	4.1 (1.1)	10 (3.9)	17 (6.5)	47 (18.1)	62 (23.9)	124 (47.7)
c. Ask if the patient is taking any other controlled medications	3.2 (1.1)	18 (6.9)	47 (6.5)	111 (42.7)	45 (17.3)	39 (15.0)
d. Verify the identification of patients prior to dispensing prescriptions for controlled medications	4.0[b] (1.1)	8 (3.10	24 (9.3)	42 (16.2)	62 (23.9)	123 (47.5)
e. Discuss treatment with buprenorphine (Subutex®) or buprenorphine/naloxone (Suboxone®) with patients or prescribers if you suspect opioid addiction	2.4 (1.4)	102 (39.2)	51 (19.6)	50 (19.20)	27 (10.4)	30 (11.5)

[a] Total does not equal to 261 due to missing response
[b] Mean calculation based on 259 responses

The level of pharmacists' agreement with statements related to actions taken if a patient was suspected of abusing controlled medication are shown in Table 5.19. Over 40 percent (44.0%) of pharmacists neither agreed nor disagreed concerning notifying law enforcement about suspected patients. Over 50 percent (51.6%) percent strongly agreed that they would refuse to fill the patients' prescription if abuse was suspected. Most strongly agreed that they would call the prescriber (57.8%) and document the incident (51.2%). However, over one-third (35.1%) of pharmacists neither agreed nor disagreed with the action regarding counseling patients about addiction. Additionally, pharmacists were asked about their agreement toward managing opioid addiction. Thirty percent (30.4%) of pharmacists neither agreed nor disagreed regarding managing opioid addiction as a chronic disease; however, 39 percent agreed to strongly agreed that pharmacists should manage this condition.

Table 5.19 Mean and Frequency Distribution of Pharmacists' Reported Actions When Suspecting Abuse of Controlled Medication and Pharmacists' Opinion Regarding Management of Opioid Addiction (N = 259)[a]

Actions	Mean (SD)	Frequency Distribution of Response Choices N (%)				
		Strongly disagree (1)	(2)	**Neither agree nor disagree** (3)	(4)	**Strongly agree** (5)
a. Notify law enforcement	2.9 (1.1)	37 (14.3)	42 (16.2)	114 (44.0)	41 (15.8)	25 (9.7)
b. Refuse to fill the prescription	4.4[b] (0.8)	4 (1.6)	1 (0.4)	21 (8.1)	99 (38.4)	133 (51.6)
c. Call the prescriber	4.5[b] (0.7)	1 (0.4)	5 (1.9)	14 (5.4)	89 (34.5)	149 (57.8)
d. Document the incident	4.2[b] (0.9)	3 (1.2)	9 (3.5)	42 (16.3)	72 (27.9)	132 (51.2)
e. Counsel patient about addictions	3.0 (1.2)	35 (13.5)	47 (18.2)	91 (35.1)	50 (19.3)	36 (13.9)
Item						
f. Opioid addiction should be managed by pharmacists similar to other chronic diseases (e.g., hypertension)	3.1[c] (1.3)	41 (16.0)	38 (14.8)	78 (30.4)	59 (23.0)	41 (16.0)

[a] Total does not equal to 261 due to missing responses
[b] Mean calculation based on 258 responses
[c] Mean calculation based on 257 responses

5.6 THEORY OF PLANNED BEHAVIOR CONSTRUCTS

The theory of planned behavior (TPB) constructs was assessed through the questionnaire. Attitude (A), subjective norm (SN), and perceived behavioral control (PBC) were captured by measuring both direct and indirect constructs. The additional predictor variables in the study were based on prior literature related to pharmacists and prescription drug abuse and is represented by the construct pharmacists' perception of prescription drug abuse (PPDA). In behaviors that are ethical or moral in nature, prior studies using the TPB have included perceived moral obligation as an additional predictor of intention (Manstead, 2000). This study measured used the term perceived obligation (PO) to capture this construct.

5.6.1 INTENTION

Intention, the primary dependent variable, was measured with three questions using a bipolar semantic differential scale ranging from -3 to +3, with higher scores corresponding to increased intention. The individual means for intention questions 1-3 were 2.5±0.9; 2.6±0.8 and 2.6±0.9, respectively and over 70 percent of the pharmacists' scores were +3 on the bipolar scale (see Table 5.20). The total intention scale score was 7.7±2.4 out of a possible score range of -9 to +9 (i.e., 3 questions x -3 to +3). Based on the individual and total scores, pharmacists in the present study have a strong positive intention to utilize the online PDMP when the validity of the prescription/patient need is in question. The intention scale alpha value was 0.9, which met the acceptable level of 0.6.

Table 5.20 Mean and Frequency Distribution of Intention

				Frequency Distribution of Response Choices N (%)						
Item	N[a]	Mean	SD	**Extremely unlikely** (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Extremely likely** (3)
1. I intend to utilize the PDMP database	260	2.5	0.9	2 (0.8)	0 (0.0)	1 (0.4)	5 (1.9)	19 (7.3)	49 (18.9)	184 (70.8)
				Definitely false (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Definitely true** (3)
2. I will try to utilize the PDMP database	259	2.6	0.8	1 (0.4)	1 (0.4)	0 (0.0)	6 (2.3)	17 (6.6)	51 (19.7)	183 (70.7)
				Strongly disagree (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Strongly agree** (3)
3. I plan on utilizing the PDMP database	260	2.6	0.9	2 (0.8)	0 (0.0)	1 (0.4)	6 (2.3)	16 (6.2)	50 (19.2)	185 (71.2)
Scale Total	**259**	**7.7[b]**	**2.4**							
Cronbach's Alpha[c]	**0.9**									

[a] Totals do not equal 261 due to missing responses
[b] The composite score for the overall scale calculation based on 259 responses, possible scale range -9 to +9
[c] Cronbach's alpha based on 3 items

5.6.2 ATTITUDE (DIRECT AND INDIRECT MEASURES)

Direct attitude in the study was measured with five questions representative of pharmacists overall subjective favorable or unfavorable views toward PDMP utilization when the validity of the prescription or patient need is in question (see Table 5.21). Each question was assessed using a 7-point bipolar semantic differential scale from -3 to +3, represented by the anchors, bad/good, inconvenient/convenient, harmful/beneficial, worthless/valuable, and useless/useful. Approximately 70 percent of pharmacists viewed PDMP utilization as good (69.6%), beneficial (70.0%), valuable (69.2%), and useful (70.5%). However, only about half of pharmacists (48.5%) thought that PDMP utilization was convenient. The total mean score for attitude (direct) was 11.4±5.3, out of a possible range of -15 to +15. Based on this scale total score, pharmacists reported a strong positive attitude toward PDMP utilization. The attitude scale reliability was acceptable at α=0.9.

Table 5.21 Mean and Frequency Distribution of Direct Attitude Measure

Q. When the validity of the prescription for controlled medication/patient need is in question, ***my utilizing the PDMP is***

				Frequency Distribution of Response Choices (%)						
Response scale	N[a]	Mean	SD	**Bad** (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Good** (3)
1.Bad/Good	260	2.5	1.0	3 (1.2)	0	1 (0.4)	11 (4.2)	11 (4.2)	53 (20.4)	181 (69.6)
				Inconvenient (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Convenient** (3)
2.Inconvenient/Convenient	260	1.8	1.5	6 (2.3)	5 (1.9)	12 (4.6)	36 (13.9)	21 (8.1)	54 (20.8)	126 (48.5)
				Harmful (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Beneficial** (3)
3. Harmful/Beneficial	260	2.4	1.2	5 (1.9)	1 (0.4)	4 (1.5)	11 (4.2)	16 (6.2)	41 (15.8)	182 (70.0)
				Worthless (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Valuable** (3)
4. Worthless/Valuable	260	2.4	1.2	5 (1.9)	1 (0.4)	3 (1.2)	12 (4.6)	20 (7.7)	39 (15.0)	180 (69.2)
				Useless (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Useful** (3)
5. Useless/Useful	261	2.4	1.2	6 (2.3)	1 (0.4)	3 (1.2)	11 (4.2)	20 (7.7)	36 (13.8)	184 (70.5)
Scale Total	**260**	**11.4[b]**	**5.3**							
Cronbach's Alpha[c]	**0.9**									

[a] Totals do not equal 261 due to missing responses
[b] The composite score for the overall scale calculation based on 260 responses, possible scale range -15 to +15
[c] Cronbach's alpha based on 5 items

Indirect attitude was measured with nine items derived from the focus group sessions. The first nine questions assessed the behavioral beliefs of pharmacists concerning utilizing the PDMP when the validity of the prescription/patient need is in question. The response scale was a 7-point bipolar semantic differential scale ranging from -3 very unlikely to +3 very likely. The second set of nine questions captured the pharmacists' outcome evaluation of PDMP utilization. Pharmacists' believed that PDMP utilization would somewhat likely to moderately likely: decrease doctor shopping (mean = 1.6±1.6), decrease diversion (mean = 1.6±1.5), improve appropriate controlled medication use (mean = 1.8±1.3) and decrease pharmacy hopping (mean = 1.8±1.5) (see Table 5.22). Pharmacists believed that violation of patient privacy would be somewhat unlikely with PDMP utilization (mean = -1.1±1.9).

With regards to pharmacists' outcome evaluations of PDMP utilization, decrease doctor shopping (mean = 2.2±1.2), decrease diversion (mean = 2.1±1.2), improve controlled medication use (mean = 2.0±1.2), and decrease pharmacy hopping (mean = 2.1±1.2) were viewed as good outcomes of PDMP utilization (see Table 5.23). Violating patient privacy (mean = -0.8±1.5) was viewed as somewhat bad by pharmacists.

Table 5.22 Mean and Frequency Distribution of Behavioral Beliefs

Q. How likely do you think the following outcomes will be if you utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

Items	N[a]	Mean	SD	Frequency Distribution of Response Choices (%)						
				Very unlikely (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Very likely** (3)
a. Decrease doctor shopping	260	1.6	1.6	13 (5.0)	5 (1.9)	13 (5.0)	13 (5.0)	54 (20.8)	63 (24.2)	99 (38.1)
b. Deny controlled medication based on inaccurate data in the PDMP	261	0.3	1.7	16 (6.1)	30 (11.5)	28 (10.7)	72 (27.6)	45 (17.2)	39 (14.9)	31 (11.9)
c. Decrease diversion of controlled medication	261	1.6	1.5	10 (3.8)	9 (3.5)	6 (2.3)	19 (7.3)	55 (21.1)	80 (30.7)	82 (31.4)
d. Violate patient privacy	261	-1.1	1.9	87 (33.3)	54 (20.7)	24 (9.2)	41 (15.7)	25 (9.6)	16 (6.1)	14 (5.4)
e. Increase risk of pharmacist liability	259	0.4	1.9	24 (9.3)	35 (13.5)	16 (6.2)	55 (21.2)	37 (14.3)	49 (18.9)	43 (16.6)
f. Consume too much time to access data	260	0.8	1.7	13 (5.0)	22 (8.5)	21 (8.1)	42 (16.2)	56 (21.5)	58 (22.3)	48 (18.5)
g. Improve appropriate controlled medication use	261	1.8	1.3	5 (1.9)	2 (0.8)	8 (3.1)	25 (9.6)	55 (21.1)	67 (25.7)	99 (37.9)
h. Decrease pharmacy hopping (i.e., using multiple pharmacies)	261	1.8	1.5	6 (2.3)	6 (2.3)	12 (4.6)	13 (5.0)	39 (14.9)	70 (26.8)	115 (44.1)
i. Decrease pharmacy profitability	261	-0.4	1.8	43 (16.5)	37 (14.2)	26 (10.0)	89 (34.1)	25 (9.6)	23 (8.8)	18 (6.9)

[a]Totals do not equal to 261 due to missing responses

Table 5.23 Mean and Frequency Distribution of Behavioral Outcome Evaluations

Q. How good or bad do you feel each of the following outcomes would be if you utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

				Frequency Distribution of Response Choices (%)						
Items	N[a]	Mean	SD	**Extremely bad** (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Extremely good** (3)
a. Decrease doctor shopping	261	2.2	1.2	4 (1.5)	2 (0.8)	4 (1.5)	11 (4.2)	30 (11.5)	76 (29.1)	134 (51.3)
b. Deny controlled medication based on inaccurate data in the PDMP	260	-0.4	1.8	34 (13.1)	43 (16.5)	44 (16.9)	71 (27.3)	22 (8.5)	24 (9.2)	22 (8.5)
c. Decrease diversion of controlled medication	261	2.1	1.2	1 (0.4)	3 (1.2)	4 (1.5)	19 (7.3)	40 (15.3)	70 (26.8)	124 (47.5)
d. Violate patient privacy	259	-0.8	1.5	50 (19.3)	38 (14.7)	37 (14.3)	96 (37.1)	21 (8.1)	9 (3.5)	8 (3.1)
e. Increase risk of pharmacist liability	260	0.6	1.9	56 (21.5)	35 (13.5)	43 (16.5)	59 (22.7)	23 (8.9)	24 (9.2)	20 (7.7)
f. Consume too much time to access data	261	-0.4	1.8	46 (17.6)	31 (11.9)	53 (20.3)	53 (20.3)	31 (11.9)	29 (11.1)	18 (6.9)
g. Improve appropriate controlled medication use	261	2.0	1.2	2 (0.8)	2 (0.8)	3 (1.2)	19 (7.3)	45 (17.2)	74 (28.4)	116 (44.4)
h. Decrease pharmacy hopping (i.e., using multiple pharmacies)	261	2.1	1.2	3 (1.2)	3 (1.2)	5 (1.9)	17 (6.5)	32 (12.3)	70 (26.8)	131 (50.2)
i. Decrease pharmacy profitability	261	0.4	1.4	32 (12.3)	25 (9.6)	43 (16.5)	120 (46.0)	15 (5.8)	19 (7.3)	7 (2.7)

[a] Total does not equal to 261 due to missing responses

Indirect attitude is determined by the two components of behavioral beliefs and outcome evaluations. Each behavioral belief is multiplied by the corresponding outcome evaluation and the resulting products are summed across all of the beliefs to provide the total score for pharmacists' indirect attitude. The results of the multiplicative summation of the behavioral beliefs and outcome evaluations are shown in Table 5.24. Since there are nine questions, the possible range for the total scores is -81 to +81. The range of scores among respondent pharmacists was -46 to +81. The overall indirect attitude score of 22.4±20.3 reflects a weak positive attitude towards pharmacists' PDMP utilization. Pharmacists' believed that a decrease in pharmacy hopping would be a likely and positive outcome of PDMP utilization (mean = 5.1±3.7). Positive belief means ranged from 0.9-4.5 and were expressed on all items except for the item of using too much time to access data (mean = -0.01±4.42).

Table 5.24 Mean and Range of Behavioral Beliefs x Outcome Evaluations (Indirect Attitude)

				Score Range[a]	
Items (Σ $b_i \cdot e_i$)	**N[b]**	**Mean**	**SD**	**Min**	**Max**
a. Decrease doctor shopping (Σ $b_1 \cdot e_1$)	260	4.5	4.2	-9	9
b. Deny controlled medication based on inaccurate data in the PDMP (Σ $b_2 \cdot e_2$)	260	0.9	3.5	-9	9
c. Decrease diversion of controlled medication (Σ $b_3 \cdot e_3$)	261	4.1	3.9	-9	9
d. Violate patient privacy (Σ $b_4 \cdot e_4$)	259	1.6	4.1	-9	9
e. Increase risk of pharmacist liability (Σ $b_5 \cdot e_5$)	258	0.8	4.5	-9	9
f. Consume too much time to access data (Σ $b_6 \cdot e_6$)	260	-0.0	4.4	-9	9
g. Improve appropriate controlled medication use (Σ $b_7 \cdot e_7$)	261	4.5	3.8	-9	9
h. Decrease pharmacy hopping (i.e., using multiple pharmacies) (Σ $b_8 \cdot e_8$)	261	5.1	3.7	-4	9
i. Decrease pharmacy profitability (Σ $b_9 \cdot e_9$)	261	1.0	3.2	-9	9
Overall scale	**254[c]**	**22.4[d]**	**20.3**	**-46**	**81**

[a] A total of nine items provide a possible range total of (±3 x ±3) x 9 = -81 to +81
[b] Totals do not equal 261 due to missing responses
[c] Represents the total number of valid responses used in calculation of the overall scale
[d] Overall mean not equal to 22.4 due to rounding error

5.6.3 SUBJECTIVE NORM (DIRECT AND INDIRECT MEASURES)

The direct subjective norm in the study was measured with two questions representative of pharmacists overall perception of social pressure to utilize the PDMP when the validity of the prescription or patient is in question (see Table 5.25). Each item was assessed using a 7-point bipolar semantic differential scale represented by the anchors, -3 = should not to +3 = should for question (a). The second item was anchored from -3 = not utilize to +3 utilize.

Almost 62 percent (61.7%) of pharmacists believed that important people in their lives would support utilization of the PDMP. Pharmacists also believed that pharmacists whose opinions they value would utilize the PDMP (67.4%). The total mean score for subjective norm (direct) was 4.8±1.9, out of a possible range of -6 to +6. Based on this total means score, pharmacists reported a strong positive subjective norm toward PDMP utilization. The subjective norm scale reliability was acceptable at α=0.8.

Table 5.25 Mean and Frequency Distribution of Subjective Norm Direct Measure

Questions	N	Mean	SD	Frequency Distribution of Response Choices (%)						
				Should not (-3)	(-2)	(-1)	(0)	(1)	(2)	**Should** (3)
a. Most people who are important to me think that I ____ utilize the PDMP.	261	2.3	1.1	2 (0.8)	0	0	22 (8.4)	20 (7.7)	56 (21.5)	161 (61.7)
				Not Utilize (-3)	(-2)	(-1)	(0)	(1)	(2)	**Utilize** (3)
b. The pharmacists whose opinions I value would ____ the PDMP.	261	2.5	1.0	2 (0.8)	0	2 (0.8)	8 (3.1)	22 (8.4)	51 (19.5)	176 (67.4)
Scale Total	**261**	**4.8**[a]	**1.9**							
Cronbach's Alpha[b,c]	**0.8**									

[a]The composite score for the overall scale, possible scale range -6 to +6
[b]Cronbach's alpha based on 2 items ($\alpha = 0.8$)
[c]Pearson's correlation also calculated for scales with less than three questions ($r = 0.7, p < .0001$)

Indirect subjective norm was measured with seven questions derived from the focus group analysis. The first seven questions assess pharmacists' normative referent individuals or groups who would potentially influence utilization of the PDMP database (see Table 5.26). The response scale was on a 7-point bipolar scale ranging from -3 very unlikely to +3 very likely. The second set of seven questions was used to assess pharmacists' motivation to comply with the referent individual or group (see Table 5.27)

Pharmacists were likely to believe that regulatory agencies (e.g., DPS) (mean = 2.6±0.9), pharmacy owners (mean = 1.4±1.6), prescribers (mean = 1.2±1.7), and other pharmacists (mean 1.7±1.4) would support pharmacists' PDMP utilization (see Table 5.26). Pharmacists were unlikely to believe that patients (mean = -1.1±1.7), and patient privacy advocates (mean = -1.1±1.7), would support pharmacists' PDMP utilization. Pharmacists had a neutral position regarding pharmaceutical manufacturers/wholesalers (mean = -0.4, SD = 1.7) support of pharmacists' PDMP utilization.

Pharmacists were likely to be motivated to comply with regulatory agencies (e.g., DPS) (mean = 2.6±0.9), pharmacy owners (mean = 1.9±1.4), prescribers (mean = 1.3±1.6), and other pharmacists (mean 1.1±1.7) (see Table 5.27). Pharmacists were neutral regarding their motivation to comply with patients (mean = -0.3±1.9), patient privacy advocates (mean = -0.4±1.8), as well as pharmaceutical manufacturers/wholesalers (mean = -0.5±1.8).

Table 5.26 Mean and Frequency Distribution of Normative Beliefs

Q. How likely is it that each of the following individuals or groups would think that you should utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

				Frequency Distribution of Response Choices (%)						
Items	N[a]	Mean	SD	**Very unlikely** (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Very likely** (3)
a. Regulatory agencies/law enforcement (e.g., TSBP, DPS, DEA)[b]	260	2.6	0.9	2 (0.8)	2 (0.8)	1 (0.4)	6 (2.3)	8 (3.1)	42 (16.2)	199 (76.5)
b. Pharmacy owners/employers	261	1.4	1.6	7 (2.7)	14 (5.4)	11 (4.2)	39 (14.9)	39 (14.9)	65 (24.9)	86 (33.0)
c. Prescribers (e.g., MD, NP, PA)[c]	261	1.2	1.7	9 (3.5)	16 (6.1)	14 (5.4)	44 (16.9)	43 (16.5)	62 (23.8)	73 (28.0)
d. Patients	260	-1.1	1.7	71 (27.3)	52 (20.0)	28 (10.8)	67 (25.8)	20 (7.7)	15 (5.8)	7 (2.7)
e. Patient privacy advocates	260	-1.1	1.7	76 (29.2)	56 (21.5)	34 (13.1)	53 (20.4)	12 (4.6)	19 (7.3)	10 (3.9)
f. Pharmaceutical manufacturers/wholesalers	261	-0.4	1.7	41 (15.7)	35 (13.4)	29 (11.1)	101 (38.7)	18 (6.9)	18 (6.9)	19 (7.3)
g. Other pharmacists	261	1.7	1.4	6 (2.3)	2 (0.8)	7 (2.7)	33 (12.6)	41 (15.7)	85 (32.6)	87 (33.3)

[a] Total does not equal to 261 due to missing response

[b] TSBP-Texas State Board of Pharmacy; DPS-Texas Department of Public Safety; DEA-Drug Enforcement Administration

[c] MD-Medical Doctor; NP-Nurse Practitioner; PA- Physician Assistant

Table 5.27 Mean and Frequency Distribution of Motivation to Comply

Q. How likely are you to do what the following individuals or groups would want you to do when it comes to utilizing the PDMP when the validity of the prescription for controlled medication/patient need is in question?

Items	N[a]	Mean	SD	Frequency Distribution of Response Choices (%)						
				Very unlikely (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Very likely** (3)
a. Regulatory agencies/law enforcement (e.g., TSBP, DPS, DEA)[b]	261	2.6	0.9	2 (0.8)	0 (0.0)	1 (0.4)	8 (3.1)	15 (5.8)	34 (13.0)	201 (77.0)
b. Pharmacy owners/employers	261	1.9	1.4	5 (1.9)	4 (1.5)	6 (2.3)	31 (11.9)	26 (10.0)	56 (21.5)	133 (51.0)
c. Prescribers (e.g., MD, NP, PA)[c]	261	1.3	1.6	5 (1.9)	13 (5.0)	7 (2.7)	58 (22.2)	43 (16.5)	51 (19.5)	84 (32.2)
d. Patients	260	-0.3	1.9	51 (19.6)	35 (13.5)	18 (6.9)	75 (28.9)	27 (10.4)	26 (10.0)	28 (10.8)
e. Patient privacy advocates	261	-0.4	1.8	47 (18.0)	31 (11.9)	28 (10.7)	86 (33.0)	23 (8.8)	22 (8.4)	24 (9.2)
f. Pharmaceutical manufacturers/wholesalers	261	-0.5	1.8	65 (24.9)	21 (8.1)	18 (6.9)	101 (38.7)	19 (7.3)	16 (6.1)	21 (8.1)
g. Other pharmacists	261	1.1	1.7	19 (7.3)	8 (3.1)	3 (1.2)	60 (23.0)	45 (17.2)	57 (21.8)	69 (26.4)

[a]Total does not equal to 261 due to missing response

[b]TSBP-Texas State Board of Pharmacy; DPS-Texas Department of Public Safety; DEA-Drug Enforcement Administration

[c]MD-Medical Doctor; NP-Nurse Practitioner; PA- Physician Assistant

Indirect subjective norm is determined by two components, normative beliefs and motivation to comply with the identified referent individual or group. Each normative belief is multiplied by the corresponding motivation to comply and the resulting products are summed across all of the beliefs to provide the total score for pharmacists' subjective norm (indirect measure). The results of the multiplicative summation of the normative beliefs and motivation to comply are shown in Table 5.28. Seven questions were used to assess subjective norm, therefore the possible range for the total scores is -63 to +63. The ranges of scores among respondent pharmacists were -36 to +63. The total score for indirect subjective norm was 22.2±16.2, which reflects a moderate positive social influence on pharmacists' utilization toward PDMP utilization. Regulatory agencies by far had the strongest influence on pharmacists' PDMP utilization (mean = 7.2±3.2).

Table 5.28 Mean and Range of Normative Belief x Motivation to Comply (Indirect Subjective Norm)

Items (Σ $n_i \cdot m_i$)	N[b]	Mean	SD	Score Range[a] Min	Max
a. Regulatory agencies/law enforcement (e.g., TSBP, DPS, DEA)[c] (Σ $n_1 \cdot m_1$)	260	7.2	3.2	-9	9
b. Pharmacy owners/employers (Σ $n_2 \cdot m_2$)	261	3.9	4.1	-9	9
c. Prescribers (e.g., MD, NP, PA)[d] (Σ $n_3 \cdot m_3$)	261	2.9	2.9	-9	9
d. Patients (Σ $n_4 \cdot m_4$)	259	1.8	4.1	-9	9
e. Patient privacy advocates (Σ $n_5 \cdot m_5$)	260	1.7	4.3	-9	9
f. Pharmaceutical manufacturers/wholesalers (Σ $n_6 \cdot m_6$)	261	1.7	3.8	-9	9
g. Other pharmacists (Σ $n_7 \cdot m_7$)	261	3.0	4.2	-9	9
Overall scale	**258[e]**	**22.2**	**16.2**	**-36**	**63**

[a]A total of nine items provide a possible range total of (±3 x ±3) x 7 = -63 to +63
[b]Total does not equal 261 due to missing responses
[c]TSBP-Texas State Board of Pharmacy; DPS-Texas Department of Public Safety; DEA-Drug Enforcement Administration
[d]MD-Medical Doctor; NP-Nurse Practitioner; PA- Physician Assistant
[e]Represents the total number of valid responses used in calculation of the overall scale

5.6.4 Perceived Behavioral Control (Direct and Indirect Measures)

Direct perceived behavioral control was operationalized with three questions to measure pharmacists' perceived control toward PDMP utilization when the validity of the prescription or patient need is in question (see Table 5.29). Each question was assessed using a 7-point bipolar semantic differential scale from -3 to +3. Two questions were anchored from -3 (strongly disagree) to +3 (strongly agree) and the third question was anchored from -3 (difficult) to +3 (easy). The majority of pharmacists were confident that they could utilize the PDMP (mean = 2.5±0.9). Seventy-one percent of pharmacists strongly agreed with being confident.

Pharmacists were not as clear regarding whether the decision to utilize the PDMP was entirely up to them (mean = 0.3±2.1). The question was worded negatively; therefore the responses were reverse coded to obtain the mean. Pharmacists were moderately positive when asked about how difficult or easy PDMP utilization would be for them (mean = 1.6±1.4). The total scale score for direct perceived behavioral control was 4.1±2.0, out of a possible range of -9 to +9. Based on the scale total score, pharmacists reported a moderately positive perceived behavioral control. Cronbach's alpha for this scale was acceptable at 0.6.

Table 5.29 Mean and Frequency Distribution of Perceived Behavioral Control Direct Measure

				Frequency Distribution of Response Choices (%)						
Questions	N[a]	Mean	SD	**Strongly disagree** (-3)	(-2)	(-1)	**Neither agree nor disagree** (0)	(1)	(2)	**Strongly agree** (3)
a. I am confident that I could utilize the PDMP.	260	2.5	0.9	1 (0.4)	1 (0.4)	2 (0.8)	9 (3.5)	16 (6.2)	46 (17.7)	185 (71.2)
				Strongly disagree (-3)	(-2)	(-1)	**Neither agree nor disagree** (0)	(1)	(2)	**Strongly agree** (3)
b.The decision to utilize the PDMP is not entirely up to me.[b]	257	0.3	2.1	33 (12.8)	29 (11.3)	26 (10.1)	62 (24.1)	20 (7.8)	27 (10.5)	60 (23.4)
				Difficult (-3)	(-2)	(-1)	**Neither easy nor difficult** (0)	(1)	(2)	**Easy** (3)
c.For me to utilize the PDMP would be…	256	1.6	1.4	1 (0.4)	4 (1.6)	13 (5.1)	51 (20.0)	30 (11.7)	70 (27.3)	87 (33.4)
Scale Total	**255**	**4.1[c]**	**2.0**							
Cronbach's Alpha[d,e]	**0.7**									

[a]Total does not equal 261 due to missing responses
[b]Represensts mean and frequency after item was reverse coded due to negative wording
[c]The composite score for the overall scale calculation based on 255 responses, possible scale range -6 to +6
[d]Cronbach's alpha based on 2 items (a and c); b was poorly correlated
[e]Pearson's correlation also calculated for scales with less than three questions ($r = 0.5, p < .0001$)

Indirect perceived behavioral control was measured with eight items derived from the from the focus group sessions. The first eight questions assessed the control beliefs of pharmacists when utilizing the PDMP database. The response scale was a 7-point bipolar semantic differential scale ranging from -3 very difficult to +3 very easy (see Table 5.30). The first set of questions measured pharmacists' control belief strength toward PDMP utilization. The second set of eight questions (see Table 5.31) measured pharmacists' perceived power to utilize the PDMP database.

Pharmacists believed that a user friendly website (mean = 2.2±1.4), PDMP interfaced with current pharmacy software (mean = 2.2±1.3), quick access/fast search results (mean = 2.4±1.1), employer support/approval (mean = 2.1±1.2), would make it easy for them to utilize the PDMP. However, pharmacists' were neutral regarding the following factors impacting PDMP utilization: lack of time (mean = -0.5±1.9) and patient retaliation for refusal to dispense controlled medication (mean = -0.1±1.8) (Table 5.30). With regards to perceived power, pharmacists were fairly neutral on all items except for control concerning insurance compensation/reimbursement (mean = -1.2±2.0) (see Table 5.31).

Table 5.30 Mean and Frequency Distribution of Controls Beliefs

Q. How easy or difficult will the following factors make it for you to utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

				Frequency Distribution of Response Choices (%)						
				Very difficult			**Neutral**			**Very easy**
Questions	N[a]	Mean	SD	(-3)	(-2)	(-1)	(0)	(1)	(2)	(3)
a. User friendly web site (database)	261	2.2	1.4	6 (2.3)	8 (3.1)	2 (0.8)	7 (2.7)	24 (9.2)	67 (25.7)	147 (56.3)
b. PDMP interfaced/connected to pharmacy prescription filling software	261	2.2	1.3	4 (1.5)	7 (2.7)	1 (0.4)	15 (5.8)	15 (5.8)	60 (23.0)	159 (60.9)
c. Quick access/fast search results	261	2.4	1.1	2 (0.8)	6 (2.3)	2 (0.8)	7 (2.7)	16 (6.1)	54 (20.7)	174 (66.7)
d. Employer support/approval	259	2.1	1.2	2 (0.8)	2 (0.89)	3 (1.2)	24 (9.3)	28 (10.8)	60 (23.2)	140 (54.1)
e. Lack of time to search PDMP (e.g., workflow issues)	261	-0.5	1.9	51 (19.5)	45 (17.2)	56 (21.5)	27 (10.3)	28 (10.7)	30 (11.5)	24 (9.2)
f. Insurance compensation/ reimbursement	260	0.7	1.8	15 (5.8)	22 (8.5)	22 (8.5)	72 (27.7)	31 (11.9)	41 (15.8)	57 (21.9)
g. Accuracy of information	261	1.4	1.8	15 (5.8)	12 (4.6)	17 (6.5)	33 (12.6)	28 (10.7)	56 (21.5)	100 (38.3)
h. Patient retaliation for refusal to dispense controlled medication	259	-0.1	1.8	30 (11.6)	35 (13.5)	34 (13.1)	74 (28.6)	26 (10.0)	26 (10.0)	34 (13.1)

[a] Total does not equal to 261 due to missing responses

Table 5.31 Mean and Frequency Distribution of Perceived Power

Q. How much control do you feel you have over the following factors when it comes to utilizing the PDMP when the validity of the prescription for controlled medication/patient need is in question?

				Frequency Distribution of Response Choices (%)						
Questions	N[a]	Mean	SD	**No control** (-3)	(-2)	(-1)	**Neutral** (0)	(1)	(2)	**Complete control** (3)
a. User friendly web site (database)	261	-0.5	2.4	99 (37.9)	20 (7.7)	14 (5.4)	27 (10.3)	18 (6.9)	39 (14.9)	44 (16.9)
b. PDMP interfaced/connected to pharmacy prescription filling software	259	-0.5	2.4	98 (37.8)	16 (6.2)	18 (7.0)	29 (11.2)	17 (6.6)	37 (14.3)	44 (17.0)
c. Quick access/fast search results	260	-0.4	2.4	89 (34.2)	27 (10.4)	14 (5.4)	29 (11.2)	17 (6.5)	43 (16.5)	41 (15.8)
d. Employer support/approval	259	0.2	2.2	56 (21.6)	16 (6.2)	16 (6.2)	44 (17.0)	35 (13.5)	45 (17.4)	47 (18.2)
e. Lack of time to search PDMP (e.g., workflow issues)	260	-0.4	1.9	51 (19.6)	31 (11.9)	51 (19.6)	37 (14.2)	35 (13.5)	33 (12.7)	22 (8.5)
f. Insurance compensation/ reimbursement	260	-1.2	2.0	114 (43.9)	30 (11.5)	20 (7.7)	49 (18.9)	12 (4.6)	17 (6.5)	18 (6.9)
g. Accuracy of information	261	-0.8	2.1	91 (34.9)	31 (11.9)	26 (10.0)	41 (15.7)	21 (8.1)	28 (10.7)	23 (8.8)
h. Patient retaliation for refusal to dispense controlled medication	260	-0.8	2.0	85 (32.7)	31 (11.9)	24 (9.2)	46 (17.7)	32 (12.3)	19 (7.3	23 (8.9)

[a] Total does not equal to 261 due to missing responses

Indirect perceived behavioral control is determined by the two components of control beliefs and perceived power. Each control belief was multiplied by the corresponding perceived power and the resulting products were summed across the eight beliefs (see Table 5.32). Based on the eight questions, the possible range for the total scores is -72 to +72. The range of scores among respondent pharmacists was -63 to +72. The overall indirect perceived behavioral control score of 1.2 (SD = 30.8) reflects a fairly weak positive control regarding pharmacists' PDMP utilization. Pharmacists expressed higher levels of control with respect to time to search PDMP (mean = 1.8±4.2) and patient retaliation for refusal to dispense controlled medication (mean = 1.9±4.4).

Table 5.32 Mean and Range of Control Belief x Perceived Power

				Score Range[a]	
Question Items ($\Sigma c_i \cdot p_i$)	**N[b]**	**Mean**	**SD**	**Min**	**Max**
a. User friendly web site (database) ($\Sigma c_1 \cdot p_1$)	261	-0.6	6.5	-9	9
b. PDMP interfaced/connected to pharmacy prescription filling software ($\Sigma c_2 \cdot p_2$)	259	-0.8	6.6	-9	9
c. Quick access/fast search results ($\Sigma c_3 \cdot p_3$)	260	-0.8	6.6	-9	9
d. Employer support/approval ($\Sigma c_4 \cdot p_4$)	257	0.7	5.6	-9	9
e. Lack of time to search PDMP (e.g., workflow issues) ($\Sigma c_5 \cdot p_5$)	260	1.8	4.2	-9	9
f. Insurance compensation/ reimbursement ($\Sigma c_6 \cdot p_6$)	259	-0.1	4.9	-9	9
g. Accuracy of information ($\Sigma c_7 \cdot p_7$)	261	-0.3	5.5	-9	9
h. Patient retaliation for refusal to dispense controlled medication ($\Sigma c_8 \cdot p_8$)	259	1.9	4.4	-4	9
Overall scale	**251[c]**	**1.2**	**30.8**	**-63**	**72**

[a] A total of eight items provide a possible range total of (±3 x ±3) x 8 = -72 to +72
[b] Totals do not equal 261 due to missing responses
[c] Represents the total number of valid responses used in calculation of the overall scale

5.6.5 CORRELATIONS AMONG TPB CONSTRUCTS

Table 5.33 shows the Spearman's rho correlations among the *direct* measure TPB constructs and the additional predictor variables in the model. All the variables in the model were significantly correlated with intention at a significance level of $p<0.01$. Table 5.34 shows the Spearman's rho correlations among the *indirect* measure constructs (i.e., focus group derived) with intention. Intention was significantly and positively correlated with indirect attitude ($r = 0.38$, $n = 254$, $p<0.001$) and subjective norm ($r = 0.18$, $n = 258$, $p<0.05$). Indirect perceived behavioral control was not significantly correlated with intention.

Table 5.33 Correlations of Predictor Variables with Intention

TPB Constructs and Other Predictor Variables	Intention	Attitude (Direct)	Subjective Norm (Direct)	Perceived Behavioral Control (Direct)	Perception of Prescription Drug Abuse	Perceived Obligation
Intention	1.00					
Attitude (Direct)	0.61***	1.00				
Subjective Norm (Direct)	0.55***	0.62***	1.00			
Perceived Behavioral Control (Direct)	0.48***	0.69***	0.56***	1.00		
Perception of Prescription Drug Abuse	0.17**	0.17**	0.18**	0.20**	1.00	
Perceived Obligation	0.48***	0.48***	0.58***	0.48***	0.17**	1.00

Note: Spearman's rho correlations are significant at * $p < 0.05$, ** $p < 0.01$, ***$p<0.001$.

Table 5.34 Spearman's Rho Correlations of the TPB Indirect Measure Constructs (Belief- Based) and Intention

TPB Constructs	Intention	Attitude (Indirect)	Subjective Norm (Indirect)	Perceived Behavioral Control (Indirect)
Intention	1.00			
Attitude (Indirect)	0.38***	1.00		
Subjective Norm (Indirect)	0.18*	0.22**	1.00	
Perceived Behavioral Control (Indirect)	-0.04	0.06	0.06	1.00

Note: Spearman's rho correlations are significant at * $p < 0.05$, ** $p < 0.01$, ***$p<0.001$.

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Table 5.35 shows the Spearman's rho correlations among the *direct* and *indirect* measure TPB constructs. Attitude and subjective norm were shown to have a significant positive relationship between the direct ($r = 0.38$, $n = 254$, $p<0.001$) and indirect ($r = 0.39$, $n = 254$, $p< 0.001$) measures. Perceived behavioral control was also significantly correlated between the direct and indirect measures, but the magnitude was lower than what was exhibited by the other constructs ($r = 0.14$, $n = 247$, $p = 0.02$).

Table 5.35 Spearman's Rho Correlations between Direct and Indirect TPB Measure Constructs

TPB Constructs	Attitude (Indirect)	Subjective Norm (Indirect)	Perceived Behavioral Control (Indirect)
Attitude (Direct)	0.38***		
Subjective Norm (Direct)		0.39***	
Perceived Behavioral Control (Direct)			0.14*

Note: Spearman's rho correlations are significant at *p < 0.05, ** p < 0.001

5.7 ADDITIONAL MODEL PREDICTORS

In order to account for other predictive variables that may influence pharmacists' intention, two additional predictor variables were developed for inclusion in the study model. The pharmacists' perception of prescription drug abuse and perceived obligation results are reported below.

5.7.1 PHARMACISTS' PERCEPTIONS OF AND ACTIONS REGARDING PRESCRIPTION DRUG ABUSE

Pharmacists were asked about their agreement with statements related to their perception of prescription drug abuse. Table 5.36 shows that pharmacists' perceived that patient abuse of controlled medication was a significant problem (mean 4.3±0.8). Pharmacists also reported agreement with the perception that prescription drug abuse is

the result of physicians' overprescribing (mean = 3.8±1.0). Pharmacists reported disagreement with the perception that they always think a prescription for a controlled medication is for abuse (mean = 2.0±1.0). Pharmacists' scale total on PPDA was 13.4±2.7, which indicated they were fairly moderate in perceiving that prescription drug abuse was problematic, possible range of 4 to 20. The alpha value for this scale was 0.6, which although is acceptable, the coefficient was the lowest of all predictor variables.

5.7.2 PERCEIVED OBLIGATION

Pharmacists were asked about their beliefs towards utilizing the PDMP based on perceived moral and professional obligation. Table 5.37 shows the results of the two questions. Pharmacists reported a strong sense of both moral obligation (mean = 4.2±1.0) and professional obligation (mean = 4.5±0.7). Cronbach's alpha for this scale was acceptable at 0.7.

Table 5.36 Mean and Frequency Distribution of Pharmacists' Perception of Prescription Drug Abuse (PPDA)

Questions	N[a]	Mean	SD	Frequency Distribution of Response Choices (%)				
				Strongly disagree (1)	(2)	**Neither agree nor disagree** (3)	(4)	**Strongly agree** (5)
a. Prescription drug abuse is a significant problem in my pharmacy.	261	3.3	1.2	21 (8.1)	47 (18.0)	69 (26.4)	81 (31.0)	43 (16.5)
b. Prescription drug abuse is the result of physicians' overprescribing controlled prescription medications.	259	3.8	1.0	5 (1.9)	21 (8.1)	59 (22.8)	103 (39.8)	71 (27.4)
c. There is a significant problem with patients abusing controlled prescription medications.	258	4.3	0.8	5 (1.9)	6 (2.3)	17 (6.6)	109 (42.3)	121 (46.9)
d. When a patient presents at my pharmacy with a prescription for a controlled medication, I always think it is for purposes of abuse.	260	2.0	1.0	99 (38.1)	81 (31.2)	63 (24.2)	12 (4.6)	5 (1.9)
e. I am concerned about abuse when a patient requests a brand name controlled medication.	261	3.5	1.2	21 (8.1)	27 (10.3)	67 (25.7)	92 (35.3)	54 (20.7)
Scale Total	**255[b]**	**13.4**	**2.7**					
Cronbach's Alpha[c]	**0.6**							

[a] Total does not equal 261 due to missing responses

[b] The composite score for the overall scale calculation based on 255 responses, possible scale range 4 to 20

[c] Cronbach's alpha based on 4 items; Item e was deleted due to poor correlation

Table 5.37 Mean and Frequency Distribution of Perceived Obligation

Questions	N [a]	Mean	SD	Frequency Distribution of Response Choices (%)				
				Strongly disagree (1)	(2)	**Neither agree nor disagree** (3)	(4)	**Strongly agree** (5)
a. I believe that it is my moral obligation to utilize the PDMP when the validity of the prescription for a controlled medication/patient need is in question.	260	4.2	1.0	5 (1.9)	10 (3.9)	44 (17.0)	66 (25.4)	135 (52.0)
b. I believe that it is my professional obligation to utilize the PDMP when the validity of the prescription for a controlled medication/patient need is in question.	261	4.5	0.7	3 (1.2)	3 (1.2)	12 (4.6)	78 (29.9)	165 (63.2)
Scale Total	**260[b]**	**8.7**	**1.5**					
Cronbach's Alpha[c,d]	**0.7**							

[a] Total does not equal 261 due to missing response
[b] The composite score for the overall scale calculation based on 260 responses, possible scale range 2 to 10
[c] Cronbach's alpha was based on 2 items
[d] Pearson's correlation also calculated for scales with less than three questions ($r = 0.6$, $p < .0001$)

5.7.3 DESCRIPTIVE OF STUDY SCALE TOTALS

Table 5.38 provides a summary of the scale total scores calculated for each of the direct and indirect TPB constructs, as well as the additional model predictors.

Table 5.38 Summary of the Mean and Range of Study Scale Totals

Scale	N	Mean	SD	Range
Intention	259	7.7	2.4	-9 to +9
Attitude (Direct)	260	11.4	5.3	-15 to +15
Attitude (Indirect)	254	22.4	20.3	-81 to +81
Subjective norm (Direct)	261	4.8	1.9	-6 to +6
Subjective norm (Indirect)	258	22.2	16.2	-63 to +63
Perceived behavioral control (Direct)	255	4.1	2.0	-6 to +6
Perceived behavioral control (Indirect)	251	1.2	30.8	-72 to +72
Pharmacists' perception of prescription drug abuse	255	13.4	2.7	4 to 20
Perceived obligation	260	8.7	1.5	2 to 10

5.8 INTERNAL CONSISTENCY

All direct measure constructs were assessed for internal consistency (reliability) of the scale construct using Cronbach's alpha. Reliability coefficients of 0.6 are generally considered acceptable. The alpha coefficients for attitude and intention were both 0.9. Subjective norm ($\alpha = 0.8$), perceived behavioral control ($\alpha = 0.7$) and perceived obligation ($\alpha = 0.7$) all showed good reliability. Regarding pharmacists' perception of prescription drug abuse (PPDA) scale, the alpha value of 0.6 was considered acceptable

(Robinson, Shaver, & Wrightsman, 1991). See Table 5.39 for a summary of alpha values.

Table 5.39 Reliability of Scale Constructs

Scale	Number of Items	Cronbach's Alpha
Intention	3	0.9
Attitude (Direct)	5	0.9
Subjective norm (Direct)	2	0.8
Perceived behavioral control (Direct)	2	0.7
Pharmacists' perception of prescription drug abuse	4	0.6
Perceived obligation	2	0.7

5.9 DATA PREPARATION AND CLEANING

Data from the questionnaires were initially entered into Microsoft Excel 2007 and variables were coded for entry into a statistical software package. Data was subsequently transferred into SAS 9.2. Data were then screened using proc univariate to assess frequencies, outliers, normal distributions and residual plots.

5.9.1 NORMALITY

When a variable is normally distributed, skewness and kurtosis should be close to zero (Tabachnick & Fidell, 2007). The univariate results for intention were as follows: skewness = -2.9 and kurtosis = 12.2. Direct attitude showed a skewness of -2.2 and kurtosis of 5.8. Direct subjective norm skewness was -2.3 and kurtosis was 8.1. Based

on the univariate statistics, the data were considered non-normally distributed. Thus, non-parametric statistics were used for the inferential statistical analyses.

5.10 TESTS OF HYPOTHESES

Data analyses related to hypotheses testing are presented in this section. The theory of planned behavior model and all other hypotheses were tested using non-parametric statistics due to violated assumptions of normal distribution in the dependent variable (intention) upon univariate and residual diagnostics. Note that objectives and hypotheses were modified slightly to incorporate the change from parametric to non-parametric analyses. The modified hypotheses are denoted with a subscript m (e.g., $H2_m$).

Objective 1: To explore the predictive utility of the TPB constructs (attitude, subjective norm, perceived behavioral control) and the predictive strength of each TPB component in predicting pharmacists' intention to utilize an online prescription database as an aid in their decision making process when dispensing controlled prescription drugs when the validity of the prescription/patient need is in question.

$H1_m$: Attitude (A), subjective norm (SN) and perceived behavioral control (PBC) will be significant predictors of pharmacists' high intention to utilize an online PDMP database.

A logistic regression analysis was used to examine the simultaneous effect of the theory of planned behavior constructs (A, SN and PBC) related to the prediction of high intention. Because of non-normality, intention was recoded to create a dichotomous dependent variable for the logistic regression analysis. Intention was operationalized as high intention, which included pharmacists who reported intention of (+3) and non-high intention, pharmacists who reported an intention score of 2 or less. Table 5.40 shows that the overall statistics for the TPB direct measures model testing the null hypothesis was rejected [χ^2 (3, 255) = 91.1, $p < 0.001$]. Additionally, the overall statistics for the TPB indirect measures model testing the null hypothesis was rejected χ^2 (3, 241) = 46.4, $p < 0.001$. All three direct and indirect TPB constructs were significantly related to pharmacists' high intention to utilize the PDMP. Therefore, **H1** was supported by the direct and indirect measure constructs.

Table 5.40 Logistic Regression Analysis for the TPB Constructs on Intention

Independent Variables	Coefficient β	Standard Error	Wald Chi-Square	p-value[c]	Odds Ratio	95% Confidence Interval
Direct Measures[a] (N = 255)[b]						
Attitude	0.60	0.21	8.17	<0.01	1.83	1.21 – 2.77
Subjective Norm	0.78	0.21	13.45	<0.01	2.19	1.44 – 3.33
Perceived Behavioral Control	0.62	0.24	6.96	<0.01	1.87	1.17 – 3.00
Indirect Measures[d] (N = 241)[b]						
Attitude	0.05	0.01	26.26	<0.001	1.05	1.03 – 1.08
Subjective Norm	0.03	0.01	7.81	<0.01	1.03	1.01 – 1.06
Perceived Behavioral Control	-0.01	0.01	1.34	0.2	0.99	0.98 – 1.01

[a]Model $X^2 = 91.12$, df =3, $p < 0.001$

[b] Total does not equal 261 due to missing responses

[c]Significance at $p < 0.05$

[d]Model $X^2 = 46.39$, df =3, $p < 0.001$

H2: **Favorable attitudes (A) will be a positive and significant predictor of pharmacists' high intention to utilize an online PDMP database while controlling for SN and PBC.**

$H2_m$: ***As attitude (A) scores increase, pharmacists are more likely to have high intention to utilize an online PDMP database while controlling for SN and PBC.***

As the score for direct attitude (A) increased by one unit, the odds of being a high intender increased 1.8 times (OR=1.83, 95% CI=1.21-2.77, p <0.01). With regards to the indirect A measure, as the score increased by one unit the odds of being a high intender increased by five percent (OR=1.05, 95% CI=1.03-1.08, p<0.001) (see Table 5.40). Therefore, **$H2_m$** was supported by the direct and indirect A measures.

H3: **Subjective norms (SN) supporting the utilization of an online PDMP database will be a positive and significant predictor of pharmacists' high intention while controlling for A and PBC.**

$H3_m$: ***As subjective norm (SN) scores increase, pharmacists are more likely to have high intention to utilize an online PDMP database while controlling for A and PBC.***

For every one unit increase in direct subjective norm (SN), the odds of being a high intender increased by 2.2 times (OR=2.19, 95% CI=1.44-3.33, p<0.01). With regards to the indirect SN, as the score increased by one unit the odds of being a high

intender increased by three percent (OR=1.03, 95% CI=1.01-1.06, p<0.01) (see Table 5.38). Therefore, **$H3_m$** was supported by both direct and indirect SN measures.

H4: Strong perceptions of behavioral control (PBC) will be a positive and significant predictor of pharmacists' high intention to utilize an online PDMP database while controlling for A and SN.

$H4_m$*: *As perceived behavioral control (PBC) scores increase, pharmacists are more likely to have high intention to utilize an online PDMP database while controlling for A and SN.

For every one unit increase in perceived behavioral control (PBC), the odds of being a high intender increased by 1.9 times (OR=1.87, 95% CI=1.17-3.00, p<0.01). Indirect PBC was not significantly related to pharmacists' high intention (OR=0.99, 95% CI=0.98-1.01, p=0.24) (see Table 5.40). Therefore, **$H4_m$** was only supported by direct PBC.

Objective 2: To determine if the perceived behavioral control construct adds to the prediction of community pharmacists' intention to utilize an online prescription monitoring database as an aid in determining whether or not to dispense a controlled prescription drug when the validity of the prescription/patient need is in question beyond that explained by attitude and subjective norm.

H5: The PBC construct will significantly add to the prediction of pharmacists' high intention to utilize an online PDMP database beyond that of attitude (A) and subjective norm (SN).

$H5_m$: As perceived behavioral control (PBC) scores increase, pharmacists are more likely to have high intention to utilize an online PDMP database beyond that explained by attitude (A) and subjective norm (SN)

As previously discussed, due to data that was not normally distributed, a hierarchical logistic regression was performed in SPSS to test the significance of the additional variable, PBC, compared to the model with A and SN only. The likelihood ratio test assesses the -2 log likelihood test for Model 1 (reduced model) minus -2 log likelihood for Model 2 (full model). As shown in Table 5.41 the model with only A and SN was significant [χ^2 (2, 255) = 84.04, $p < 0.001$] and the model with A, SN and PBC was also significant [χ^2 (3, 255) = 91.13, $p < 0.001$]. The likelihood ratio test showed that the addition of PBC to the model significantly improved the model prediction of high intention [χ^2 (1, 255) = 7.09, $p < 0.01$]. Hierarchical logistic regression analysis was also conducted for the indirect measure constructs of TPB. Table 5.41 shows that the addition of PBC in Model 2 did not significantly improve model prediction [χ^2 (1, 241) = 1.36, $p = 0.24$]. Therefore, **H5** was only supported for the direct measures.

Table 5.41 Hierarchical Logistic Regression Analyses of the Theory of Planned Behavior Constructs (Direct and Indirect) Related to Pharmacists' Intentions to Utilize the PDMP Database

Independent Variables	Odds Ratio	95% CI	Chi-Square[a]	p-value[b]
Direct Measures (N = 255)[c]				
Model 1 $_{direct}$				
Attitude	2.46	1.69 – 3.57	84.04	<0.001
Subjective Norm	2.50	1.66 – 3.77		
Model 2 $_{direct}$				
Attitude	1.83	1.21 – 2.77	91.13	<0.001
Subjective Norm	2.19	1.44 – 3.33		
Perceived Behavioral Control	1.87	1.17 – 2.97		
Likelihood ratio test assessing significance of PBC[d] addition			7.09	<0.01[e]
Indirect Measures (N = 241)[c]				
Model 1 $_{indirect}$				
Attitude	1.05	1.03 – 1.08	45.04	<0.001
Subjective Norm	1.03	1.01 – 1.06		
Model 2 $_{indirect}$				
Attitude	1.05	1.03 – 1.08	46.40	<0.001
Subjective Norm	1.03	1.01 – 1.06		
Perceived Behavioral Control	0.99	0.98 – 1.01		
Likelihood ratio test assessing significance of PBC[d] addition			1.36	0.24[e]

[a]Test of null hypothesis for Model (1), df =2, Test of Model (2), df =1
[b]Significance at $p < 0.05$
[c]Total does not equal 261 due to missing responses
[d]PBC—Perceived behavioral control
[e]Statistical significance was assessed by change in likelihood ratio test: -2 log likelihood (Model 1 – Model 2)

Objective 3: To determine if the pharmacists' perception of prescription drug abuse (PPDA) adds to the prediction of community pharmacists' intention to utilize an online prescription monitoring database when the validity of the prescription/patient need is in question beyond that explained by attitude, subjective norm, and perceived behavioral control.

H6: The perception of prescription drug abuse (PPDA) construct will significantly add to the prediction of pharmacists' high intention to utilize the PDMP database beyond that of the TPB constructs (A, SN and PBC).

$H6_m$: As the perception of prescription drug abuse (PPDA) scores increase, pharmacists are more likely to have high intention to utilize an online PDMP database beyond that explained by the TPB (A, SN, and PBC).

Hierarchical logistic regression was used to assess the addition of the PPDA construct (Model 2) to the TPB direct measure constructs (Model 1). According to the likelihood ratio test [χ^2 (1, 249) = 0.49, p = 0.49], the inclusion of the PPDA construct did not significantly improve Model 2 (see Table 5.42). Therefore, **H6** was not supported.

Objective 4: To determine if pharmacists' perceived moral obligation (PO) adds to the prediction of community pharmacists' intention to utilize an online prescription monitoring database when the validity of the prescription/patient need is in question beyond that explained by attitude, subjective norm, and perceived behavioral control.

Table 5.42 Hierarchical Logistic Regression Analyses of the Theory of Planned Behavior Constructs (Direct) and Pharmacists' Perception of Prescription Drug Abuse Related to Pharmacists' Intentions to Utilize the PDMP Database

Independent Variables	Odds Ratio	95% CI	Chi-Square[a]	p-value[b]
Direct Measures (N = 249)[c]				
Model 1				
Attitude	1.82	1.19 – 2.79	89.52	<0.001
Subjective Norm	2.26	1.46 – 3.50		
Perceived Behavioral Control	1.84	1.15 – 2.93		
Model 2				
Attitude	1.82	1.19 – 2.78	90.01	<0.001
Subjective Norm	2.23	1.44 – 3.46		
Perceived Behavioral Control	1.83	1.15 – 2.91		
Pharmacists' Perception of Prescription Drug Abuse	1.22	0.70 – 2.13		
Likelihood ratio test assessing significance of PPDA[d] addition			0.49	0.49[e]

[a]Test of null hypothesis for Model (1), df =3, Test of Model (2), df = 1
[b]Significance at $p < 0.05$
[c]Total does not equal 261 due to missing responses
[d]PPDA-Pharmacists' perception of prescription drug abuse
[e]Statistical significance was assessed by change in likelihood ratio test: -2 log likelihood (Model 1 – Model 2)

H7: The pharmacists' perceived obligation (PO) construct will significantly add to the prediction of pharmacists' high intention to utilize an online PDMP database beyond that of the TPB constructs (A, SN and PBC).

$H7_m$: As the pharmacists' perceived obligation (PO) scores increase, pharmacists are more likely to have high intention to utilize an online PDMP database beyond that explained by the TPB constructs (A, SN, and PBC).

Hierarchical logistic regression was used to assess the addition of perceived obligation (PO) (Model 2) to the TPB direct measure constructs (Model 1). The likelihood ratio test showed that the addition of PO to the model significantly improved

the model prediction of high intention [χ^2 (1, 254) = 4.14, p = 0.04]. See Table 5.43. Therefore, **H7** was supported.

Table 5.43 Hierarchical Logistic Regression Analyses of the Theory of Planned Behavior Constructs (Direct) and Perceived Obligation Related to Pharmacists' Intentions to Utilize the PDMP Database

Independent Variables	**Odds Ratio**	**95% CI**	**Chi-Square[a]**	**p-value[b]**
Direct Measures (N = 254)[c]				
Model 1				
Attitude	1.82	1.20 – 2.77	90.76	<0.001
Subjective Norm	2.19	1.44 – 3.33		
Perceived Behavioral Control	1.86	1.17 – 2.96		
Model 2				
Attitude	1.72	1.13 – 2.63	94.90	<0.001
Subjective Norm	1.90	1.23 – 2.94		
Perceived Behavioral Control	1.72	1.07 – 2.77		
Perceived Obligation	1.77	1.02 – 3.07		
Likelihood ratio test assessing significance of PO[d] addition			4.14	0.04[e]

[a]Test of null hypothesis for Model (1), df =3, Test of Model (2), df = 1
[b]Significance at p < 0.05
[c]Total does not equal 261 due to missing responses
[d]PO—Perceived obligation
[e]Statistical significance was assessed by change in likelihood ratio test: -2 log likelihood (Model 1 – Model 2)

Objective 5: To determine if attitude, subjective norm, perceived behavioral control toward utilizing an online prescription monitoring database as an aid in determining whether or not to dispense a controlled prescription drug when the validity of the prescription/patient need is in question is related to demographic characteristics or practice factors.

H8: There is no difference between male and female pharmacists' A toward utilizing an online prescription monitoring database.

A Wilcoxon-Mann Whitney U test was conducted to evaluate the hypothesis that male and female pharmacists hold the same attitude (A) toward utilizing the PDMP. The test (see Table 5.44) showed no significant difference in direct A scores between males (median = 2.8) and females (median = 2.8), (Z = 1.2, p = 0.2). The indirect A measure showed no significant difference in the A scores between males (median = 22.0) and females (median = 22.0), (Z = -0.1, p = 0.9). Therefore, **H8** was supported.

Table 5.44 Wilcoxon-Mann-Whitney Test Comparison of Attitude (A) by Pharmacists' Gender

Direct A	N=261[a]	Mean Rank Scores	p-value
Male	136	126.0	0.2
Female	125	136.4	
Indirect A	**N=254[a]**		
Male	131	127.8	0.9
Female	123	127.2	

[a]Total does not equal 261 due to missing responses

H9: There is no difference between male and female pharmacists' SN toward utilizing an online PDMP database.

A Wilcoxon-Mann Whitney U test was conducted to evaluate the hypothesis that male and female pharmacists hold the same subjective norm (SN) toward utilizing the PDMP. The test (see Table 5.45) showed no significant difference in direct SN scores between males (median = 3.0) and females (median = 3.0), (Z = 1.1, p = 0.3). The indirect SN measure showed no significant difference in the SN scores between males (median = 21.5) and females (median = 21.0), (Z = -0.9, p = 0.4). Therefore, **H9** was supported.

Table 5.45 Wilcoxon-Mann-Whitney Test Comparison of Subjective Norm by Pharmacists' Gender

Direct SN	**N=261**	**Mean Rank Scores**	**p-value**
Male	136	126.7	0.3
Female	125	135.7	
Indirect SN	**N=258**[a]		
Male	134	133.5	0.4
Female	124	125.2	

[a]Total does not equal 261 due to missing responses

H10: There is no difference between male and female pharmacists' PBC toward utilizing an online prescription monitoring database.

A Wilcoxon-Mann Whitney U test was conducted to evaluate the hypothesis that male and female pharmacists hold the same perceived behavioral control (PBC) toward utilizing the PDMP. The test (see Table 5.46) with the direct PBC measure showed no significant difference in PBC scores between males (median = 2.5) and females (median = 2.5), (Z = 0.8, p = 0.4). The test with the indirect PBC measure showed a significant difference in PBC scores between males (median = 6.0) and females (median = -8.0), (Z

= -3.8, $p < 0.001$), which indicates that females PBC is almost 4 points lower than males. Therefore, **H10** was supported for the direct measure, but rejected for the indirect PBC.

Table 5.46 Wilcoxon-Mann-Whitney Test Comparison of Perceived Behavioral Control (PBC) by Pharmacists' Gender

Direct PBC	**N=255[a]**	**Mean Rank Scores**	**p-value[b]**
Male	134	124.5	0.4
Female	121	132.0	
Indirect PBC	**N=251[a]**		
Male	132	142.5	<0.001
Female	119	107.7	

[a]Total does not equal 261 due to missing responses

[b]Significance at $p < 0.05$

H11: There is no difference in pharmacists' A toward utilizing an online prescription monitoring database and pharmacists' experience.

Spearman's rho correlation was used to address this hypothesis. Pharmacists' direct measure attitude (A) showed no significant association between A and pharmacists' years of practice experience quartile ($r = -0.05$, $p = 0.4$). Indirect measure A was also not significantly associated with pharmacists' years of practice experience quartile ($r = -0.02$, $p = 0.8$). Therefore, **H11** was supported (see Table 5.47).

Table 5.47 Spearman's Rho Correlation between Attitude and Pharmacists' Years of Community Practice Experience

	Experience (Years)	
Variables	**Spearman's rho**	**p-value**
Attitude (Direct) N=257[a]	-0.05	0.4
Attitude (Indirect) N=250[a]	-0.02	0.8

[a]Total does not equal 261 due to missing responses

H12: There is no difference in pharmacists' SN toward utilizing an online PDMP database and pharmacists' experience.

According to Spearman's rho, pharmacists' direct measure subjective norm (SN) showed no significant association between SN and pharmacists' years of practice experience quartile ($r = 0.01$, $p = 0.9$). Indirect measure SN was also not significantly associated with pharmacists' years of practice experience quartile ($r = 0.07$, $p = 0.3$). Therefore, **H12** was supported (see Table 5.48).

Table 5.48 Spearman's Rho Correlation between Subjective Norm and Pharmacists' Years of Community Practice Experience

	Experience (Years)	
Variables	**Spearman's rho**	**p-value**
Subjective Norm (Direct)[a] N=257	0.01	0.9
Subjective Norm (Indirect)[a] N=254	0.07	0.3

[a]Total does not equal 261 due to missing responses

H13: There is no difference in pharmacists' PBC toward utilizing an online PDMP database and pharmacists' experience.

According to Spearman's rho, pharmacists' direct measure perceived behavioral control (PBC) showed no significant association between PBC and pharmacists' years of practice experience quartile ($r = -0.11$, $p = 0.06$). The Spearman's rho shows a significant positive relationship between indirect measure PBC and pharmacists' years of practice experience quartile ($r = 0.16$, $p = 0.01$). Therefore, **H13** was supported for the direct measure PBC and rejected for the indirect measure PBC (see Table 5.49). Indirect PBC scores increased as pharmacists' years of practice experience increased.

Table 5.49 Spearman's Rho Correlation between Perceived Behavioral Control and Pharmacists' Years of Community Practice Experience

	Experience (Years)	
Variables	**Spearman's rho**	**p-value[b]**
Perceived Behavioral Control (Direct) N=257[a]	-0.11	0.06
Perceived Behavioral Control (Indirect) N =247 [a]	0.16	0.01

[a]Total does not equal 261 due to missing responses
[b]Significance at $p < 0.05$

H14: There is no difference in pharmacists' A toward utilizing an online PDMP database and pharmacists' primary practice location.

The Kruskal-Wallis test showed no significant difference in attitude (A) scores (direct measure) based on pharmacists' primary practice location (e.g., rural, urban, suburban), χ^2 (2, 256) = 3.0, $p = 0.22$. Using the indirect A, the Kruskal-Wallis test showed no significant differences in A scores based on pharmacist' primary practice location χ^2 (2, 249) = 0.1, $p = 0.96$. Therefore, **H14** was supported (see Table 5.50).

H15: There is no difference in pharmacists' SN toward utilizing an online PDMP database and pharmacists' primary practice location.

The Kruskal-Wallis test showed no significant difference in subjective norm (SN) scores (direct measure) based on pharmacists' primary practice location (e.g., rural, urban, suburban), χ^2 (2, 256) = 0.6, p = 0.73. Using the indirect SN, the Kruskal-Wallis test showed no significant differences in scores based on pharmacists' primary practice location χ^2 (2, 253) = 3.9, p = 0.14. Therefore, **H15** was supported (see Table 5.51).

H16: There is no difference in pharmacists' PBC toward utilizing an online PDMP database and pharmacists' primary practice location.

The Kruskal-Wallis test showed no significant difference in perceived behavioral control (PBC) scores (direct measure) based on pharmacists' primary practice location (e.g., rural, urban, suburban), χ^2 (2, 250) = 5.3, p = 0.07. Using the indirect measure PBC, the Kruskal-Wallis test showed no significant differences in PBC scores based on pharmacist' primary practice location χ^2 (2, 246) = 0.7, p = 0.71. Therefore, **H16** was supported (see Table 5.52).

Table 5.50 Kruskal-Wallis Rank Sums Test of Mean Rank Attitude (A) Scores by Pharmacists' Practice Location

Pharmacists' Practice Location	N[a]	Mean Rank	Chi-Square	df	p-value
Direct A	256				
Rural	45	114.3	3.0	2	0.22
Urban	102	127.1			
Suburban	109	135.7			
Indirect A	249				
Rural	45	122.3	0.1	2	0.96
Urban	99	125.1			
Suburban	105	126.1			

[a]Total does not equal 261 due to missing responses

Table 5.51 Kruskal-Wallis Rank Sums Test of Mean Rank Subjective Norm (SN) Scores by Pharmacists' Practice Location

Pharmacists' Practice Location	N[a]	Mean Rank Scores	Chi-Square	df	p-value
Direct SN	256				
Rural	45	128.7	0.6	2	0.73
Urban	102	124.6			
Suburban	109	132.0			
Indirect SN	253				
Rural	45	136.0	3.9	2	0.14
Urban	101	134.3			
Suburban	107	116.3			

[a]Total does not equal 261 due to missing responses

Table 5.52 Kruskal-Wallis Rank Sums Test of Mean Rank Perceived Behavioral Control (PBC) Scores by Pharmacists' Practice Location

Pharmacists' Practice Location	N[a]	Mean Rank Scores	Chi-Square	df	p-value
Direct PBC	250				
Rural	44	120.2	5.3	2	0.07
Urban	101	115.5			
Suburban	105	137.3			
Indirect PBC	246				
Rural	44	131.5	0.7	2	0.71
Urban	98	122.5			
Suburban	104	121.1			

[a]Total does not equal 261 due to missing responses

H17: There is no difference in pharmacists' A toward utilizing an online PDMP database and pharmacists' race/ethnicity.

The Kruskal-Wallis test showed no significant difference in direct measure attitude (A) scores by pharmacists' race/ethnicity, χ^2 (3, 254) = 2.7, p = 0.45. Using the indirect A, the Kruskal-Wallis test showed no significant differences in A scores based on pharmacist' primary practice location χ^2 (3, 247) = 1.4, p = 0.72. Therefore, **H17** was supported (see Table 5.53).

Table 5.53 Kruskal-Wallis Rank Sums Test of Mean Rank Attitude (A) Scores by Race/Ethnicity

Race/Ethnicity	N[a]	Mean Rank Scores	Chi-Square	df	p-value
Direct A	254				
Caucasian	169	123.6	2.7	3	0.45
Mexican American	26	124.0			
African American	29	143.3			
Asian American	30	137.1			
Indirect A	247				
Caucasian	167	121.3	1.4	3	0.72
Mexican American	25	121.7			
African American	27	137.4			
Asian American	28	129.1			

[a]Total does not equal 261 due to missing responses; American Indian category was deleted for fewer than 5 responses (n=3)

H18: There is no difference in pharmacists' SN toward utilizing an online PDMP database and pharmacists' race/ethnicity.

The Kruskal-Wallis test showed no significant difference in direct measure subjective norm (SN) scores by pharmacists' race/ethnicity, χ^2 (3, 254) = 0.5, p = 0.92. Using the indirect SN, the Kruskal-Wallis test showed no significant differences in SN scores based on pharmacist' primary practice location χ^2 (3, 251) = 1.4, p = 0.70. Therefore, **H18** was supported (see Table 5.54).

Table 5.54 Kruskal-Wallis Rank Sums Test of Mean Rank Subjective Norm (SN) Scores by Race/Ethnicity

Race/Ethnicity	N[a]	Mean Rank Score	Chi-Square	df	p-value
Direct SN	254				
Caucasian	169	126.5	0.5	3	0.92
Mexican American	26	133.1			
African American	29	123.3			
Asian American	30	132.4			
Indirect SN	251				
Caucasian	168	129.1	1.4	3	0.70
Mexican American	26	111.9			
African American	29	120.8			
Asian American	28	125.6			

[a]Total does not equal 261 due to missing responses; American Indian category was deleted for fewer than 5 responses (n=3)

H19: There is no difference in pharmacists' PBC toward utilizing an online PDMP database and pharmacists' race/ethnicity.

The Kruskal-Wallis test showed no significant difference in direct measure perceived behavioral control (PBC) scores by pharmacists' race/ethnicity, χ^2 (3, 248) = 3.4, p = 0.33. Using the indirect PBC, the Kruskal-Wallis test showed no significant differences in PBC scores based on pharmacist' primary practice location χ^2 (3, 245) = 4.5, p = 0.21. Therefore, **H19** was supported (see Table 5.55).

Table 5.55 Kruskal-Wallis Rank Sums Test of Mean Rank Perceived Behavioral Control (PBC) Scores by Race/Ethnicity

Race/Ethnicity	N[a]	Mean Rank Score	Chi-Square	df	p-value
Direct PBC	248				
Caucasian	166	121.0	3.4	3	0.33
Mexican American	25	123.5			
African American	29	147.0			
Asian American	28	122.7			
Indirect PBC	245				
Caucasian	163	116.6	4.5	3	0.21
Mexican American	26	138.9			
African American	29	128.0			
Asian American	27	140.7			

[a]Total does not equal 261 due to missing responses; American Indian category was deleted for fewer than 5 responses (n=3)

CHAPTER SIX: DISCUSSION AND CONCLUSIONS

This chapter begins with a review of the research question and study objectives followed by a discussion of the focus groups. After which, the study sample, as well as the study findings will be discussed and compared with previous research. The last part of this chapter will evaluate the study model and discuss study limitations; followed by the study implications, future research, and the study conclusion.

6.1 REVIEW OF RESEARCH QUESTION

Because prescription drug abuse is the nation's fastest growing drug problem, many state and federal agencies have been called to action to combat the growing rate of abuse (Office of National Drug Control Policy, 2011). Along with educating the public and health care providers about the risk of prescription drug abuse, PDMPs may be a useful tool to combat the epidemic (United States General Accounting Office, 2002). Fleming et. al. (2011), examined PDMP utilization by health care professionals from data obtained from a survey of PDMP administrators regarding requests for patient reports by authorized users. The results of the study found that prescribers utilized PDMP reports more than pharmacists during fiscal year 2008 to 2009, mead data requests for pharmacists were (2198±3218) compared to prescribers (269±261). However, due to a small sample size (n=15), inferential statistics were not reported. Nevertheless, descriptive statistics reveal that prescribers requested PDMP patient reports eight times

that of pharmacists. Furthermore, there are no known studies that have specifically examined pharmacists' utilization of PDMP data using behavioral theory.

6.2 FOCUS GROUP FINDINGS

Focus group sessions were conducted to elicit the commonly held beliefs of pharmacists regarding PDMP database utilization. The TPB constructs attitude (behavioral beliefs), subjective norm (normative beliefs) and perceived behavioral control (control beliefs) guided the content analysis of focus group data.

Pharmacists were concerned about the potential liability risks associated with inaccurate data in PDMPs (e.g., patients with the same name) and making dispensing decisions based on the possibility of having incorrect profiles. Pharmacists believed that PDMPs would improve appropriate controlled medication use and decrease drug diversion. One participant responded regarding their behavioral beliefs:

> *"...it would provide good guidance on what their utilization (of controlled medication) is, maybe their pain isn't well controlled..."*

Pharmacists in the focus group expressed concerns regarding the negative impact of PDMP utilization on independent pharmacy owner profit margins. Some concern was evident related to perceived expectations by regulatory agencies upon routine audits. A recent news reports suggests that chain pharmacies are also making huge profits from dispensing CPDs (ABC News, 2012). One participant responded regarding their normative belief:

> *"...The independents are not as scrutinizing for a lot of reasons because it is a cash source situation..."*

Although not yet online accessible, pharmacists believed that interfacing their current pharmacy software with the PDMP database would better enable them to utilize the system. Respondents also seemed interested in the ease of website log-in and the speed of patient searches. Pharmacists working in busy environments were concerned mainly about the time needed to search patient data. One participant commented on PDMP control belief:

> *"The server needs to be robust!...So that it is going to respond quickly when it is accessed. I don't want slow downs on Monday at 5:00 o'clock…"*

All things considered, focus group participants believed that online access to PDMP data would lead to appropriate controlled medication therapy and aid in their decision to dispense controlled medication. However, they expressed concerns of liability and were skeptical that a slow website or complicated log-in criteria would not be conducive to busy community pharmacy environments.

6.3 STUDY SAMPLE CHARACTERISTICS AND RESPONSE RATE

A random sample of 998 Texas community pharmacists served as our valid study population and 261 pharmacists provided useable responses. This resulted in a 26.4 percent response rate, which was similar to other studies (Brown, Barner, & Shah, 2005; Brown, et al., 2007; Gavaza et al., 2011) that utilized Texas pharmacists as a study population and another study of pharmacists in Kentucky (Blumenschein, K., et al., 2010).

Of the 21,273 pharmacists residing in Texas in 2011 (Texas State Board of Pharmacy, 2011), females (n=10,936; 51.4%) slightly outnumbered males (n=10,336; 48.6%). In our study sample males represented 52.1 percent of respondents, compared to 47.9 percent of females. Although the percentage of males were slightly higher in our population, as with the Texas population, there was almost a fifty-fifty gender split. In Texas, the majority of pharmacists are Caucasian/Non-Hispanic White (56.6%), followed by Asian American/Pacific Islander (17.5%), then African American/Non-Hispanic Black (14.0%) and Mexican American/Hispanics (8.8%). Compared to the state of Texas, our sample had a higher prevalence of Caucasian/Non-Hispanic Whites (65.8%) and Mexican American/Hispanics (10.1%), whereas African American/Non-Hispanic Blacks (11.3%) and Asian American/Pacific Islander (11.7%) had a lower prevalence. Overall, the study sample was fairly well representative the state of Texas pharmacists in terms of gender and race/ethnicity.

6.4 THEORY OF PLANNED BEHAVIOR STUDY FINDINGS

Pharmacists' intention was the main outcome variable of the study. In the TPB, intention is determined by attitude, subjective norm and perceived behavioral control. Below is a discussion of each construct.

6.4.1 PHARMACISTS' INTENTION

In this study, respondents overwhelmingly intended (i.e., mean intention score >1) to utilize the PDMP database when the validity of the prescription/patient need is in

question. This is evidenced by only three respondents reporting mean negative intention [i.e., -3 (n=1), -2 (n=1), -0.7 (n=1)] and by a very high total scale score of 7.7±2.4 (range: -9 to +9). This finding is not surprising in light of the growing publicity of prescription drug abuse and pharmacy robberies (Brushwood & Kimberlin, 2004; Horswell, 2010; Smith et al., 2009). Pharmacists responding to this study may have experienced robbery or may frequently encounter patients who doctor shop or are involved with drug diversion. Prior research on pharmacists' reasons for registering for PDMP data showed that pharmacists that think utilization will decrease diversion and doctor shopping were more likely to enroll (Ulbrich, et al., 2010). Data from other states with online PDMP access have shown that pharmacist have relatively low enrollment in PDMP programs.

However, our study may have also reflected a biased sample, since the majority (>70%) of respondents were high intenders (i.e., responded +3 on the bipolar scale: range -3 to +3). Findings from another study also showed that 'interested' pharmacists are more likely to respond. A survey was mailed to 2000 Kentucky pharmacists, 1000 of which were registered with their PDMP and 1000 not registered. Over three-quarters (77%) of the respondents were registered, which may indicate that the sample was biased towards pharmacists who had accessed the system (Blumenschein, K., et al., 2010).

In other studies that used the TPB to examine pharmacists' behaviors, intention has been shown to be a significant predictor of behavior (Odedina, et al., 1997; Pradel, Obeidat, & Tsoukleris, 2007). Because the online system was not available at the time of this study, we were unable to measure current or past behavior with PDMPs. However, evidence exists in other states showing that actual behavior in utilizing PDMPs has been

relatively low. In Kentucky, only 16 percent of pharmacists had registered for PDMP access and Maine reported 13 percent of pharmacists registered (Blumenschein, K., et al., 2010; Sorg, 2009). Nevertheless, it is encouraging that at least among the survey respondents, there is a strong intent to utilize PDMP data once online access is made available.

6.4.2 PHARMACISTS' ATTITUDE TOWARD PDMP UTILIZATION

In this study, it was hypothesized that attitude would be significantly related to high intention. Pharmacists with a positive attitude toward PDMP utilization were almost twice as likely to have high intention. Overall pharmacists' attitudes were positive (mean±sd scale total = 11.4±5.3; range= -15 to +15) which may indicate that Texas pharmacists recognized the value of utilizing the PDMP. Other studies of pharmacists also reported favorable perceptions toward PDMPs (Blumenschein, K., et al., 2010; Fass & Hardigan, 2011). Fass & Hardigan (2011) conducted a study of Florida pharmacists (N = 836) from all practice settings prior to PDMP implementation. The majority of chain pharmacists (84%) agreed or strongly agreed that the PDMP should be implemented and that it would decrease doctor shopping (80.8%). Additionally, 80.3 percent of chain pharmacists in Florida disagreed or strongly disagreed that the PDMP would be an invasion of patient privacy. In a survey of Kentucky pharmacists registered with the PDMP (n = 492), 92.9 percent believed the PDMP was effective in preventing diversion (Blumenschein, K., et al., 2010).

Comparatively, upon examination of the behavioral beliefs in our study, a decrease in doctor shopping, diversion, pharmacy hopping, and an improved controlled medication therapy were all reported as likely outcomes of PDMP utilization and outcome evaluations indicated that these were also viewed to be good. The means for the aforementioned beliefs range from 1.6 to 1.8 on a scale from -3 = very unlikely to +3 very likely. Pharmacists in this study also believed that it is somewhat unlikely that PDMP utilization would violate patient privacy (mean = -1.1±1.9). Likewise, in a study of pharmacists in Ohio, when asked about the main reasons for PDMP registration, decreased doctor shopping was the primary reason. In our study, pharmacists were neutral regarding PDMP utilization consuming too much time. Although Ohio pharmacists were concerned about this issue, they cited time constraints as the main reason for not registering to access the data (Ulbrich, et al., 2010).

In a study of advanced nurse practitioners' use of a PDMPs (n = 57), 96.4 percent agreed that PDMP information helped to improve appropriate prescribing (LeMire, Martner, & Rising, 2012). More importantly, 98.2 percent reported that information from the PDMP helped improve the overall care provided for patients. When considering the pharmacist's role on the health care team in providing patient care services, information obtained from the PDMP may lead to more appropriate dispensing of controlled medications, which may lead to better overall care of patients.

6.4.3 PHARMACISTS' SUBJECTIVE NORM TOWARD PDMP UTILIZATION

Pharmacists' subjective norm was significantly related to pharmacists' high intention, which provided support for the hypothesis, examining both the direct measure and indirect measure using logistic regression. Direct measure subjective norm (SN) total scale score was 4.8 out of range of -6 to +6. Gavaza et al. (2011) also found SN to be a significant and the strongest predictor (SN (β) = 0.78 compared to A (β) = 0.60 and PBC (β) = 0.62) of pharmacists' intention to report adverse events to the FDA.

Pharmacists' believed that regulatory agencies (e.g., Texas State Board of Pharmacy and DPS) would be very likely to support PDMP utilization (mean = 2.6±0.9; possible range -3 to +3) and pharmacists were moderately to very likely to comply with them. Texas is one of seven states where the PDMP is administered by a law enforcement agency (Alliance of States with Prescription Monitoring Programs, 2012). Pharmacists' may feel the need to comply with DPS for fear that inaction could result in discipline. Pharmacist may be even more influenced by the Texas State Board of Pharmacy (TSBP), which routinely conducts pharmacy audits. Consideration was given to transfer the authority to the TSBP, however, that measure was not enacted (Texas State Board of Pharmacy, 2009).

Furthermore, Joranson & Gilson (2001), reported that 14 percent of pharmacists respondents had been investigated or audited in the past regarding controlled substances and thirty-five percent believed they would be audited by a regulatory agency in the future. Because pharmacists are accustomed to being audited (Blackburn, 2010), it was not surprising that in our study, regulatory agencies were most influential in predicting

pharmacists' high intention; weighted mean of normative belief and motivation to comply regarding regulatory agencies was 7.2±3.2, out of possible range of -9 to +9.

Regarding other subjective norms, pharmacy owners and other pharmacists were believed to be somewhat likely to support pharmacists' PDMP utilization (means = 1.4 and 1.7, range: -3 to +3), respectively, and the respondents were moderately to very likely to comply with them (means = 2.6 and 1.9, respectively; range: -3 to +3). Thus, pharmacy organizations such as TPA may be influential in educating and encouraging pharmacists to utilize the online PDMP. Conversely, pharmacists' were somewhat unlikely to believe that patients and patient privacy advocates would want them to utilize the PDMP, (both means were -1.1, range: -3 to +3) and they were mainly neutral to somewhat unlikely to be motivated to comply (mean = -0.3 and -0.4, respectively, range: -3 to +3).

6.4.4 Pharmacists' Perceived Behavioral Control Toward PDMP Utilization

Pharmacists' in our study reported a positive and moderately strong direct measure perceived behavioral control (PBC). The scale total was 4.1±2.0 out of a possible -6 to +6. Pharmacists were moderately confident in using the PDMP (mean = 2.5±0.9, range -3 to +3) and the majority (66.7%) reported that quick access/fast search results would make it very easy. Other factors that would make it moderately easy to utilize the PMDP were user friendly website (mean = 2.2±1.4, range: -3 to +3), PDMP interfaced with pharmacy software (mean = 2.2±1.3, range: -3 to +3), and employer

support/approval (mean = 2.1±1.2, range: -3 to +3), respectively. Comparatively, 16.2 percent of respondent pharmacists in Maine (n = 67) suggested improvements were needed related to difficulty logging in to the PDMP and cumbersome software interfacing (Sorg, 2009). One pharmacist in our study sample worked at a pharmacy participating in the piloting of the Texas PDMP, and commented that "it took too long to log-in."

Although Ulbrich et al. (2010), reported that the lack of time was the main reason pharmacists were not registered to access the PDMP, pharmacists in our study were fairly neutral (mean -0.5±1.9; possible range -3 to +3) regarding time constraints. Additionally, pharmacists were also primarily neutral on almost all perceived power items. It is likely that pharmacists were neutral on both time constraints and perceived power because at the time of the study, online PDMP access was not available. A follow up survey of Texas pharmacists once the PDMP is online accessible may show a decrease in pharmacists' high intention based on lower PBC scores. More importantly, PBC may attenuate the intention to behavior link due to problems associated with the online PDMP web portal. Suggestions for online access are in section 6.9 below.

6.5 ADDITIONAL MODEL PREDICTOR VARIABLES

In addition to the TPB predictors, pharmacists' perception of prescription drug abuse and perceived obligation were included as predictors of pharmacists' intention to utilize the PDMP.

6.5.1 PHARMACISTS' PERCEPTION OF PRESCRIPTION DRUG ABUSE

This construct was derived from previous literature on pharmacists' unwillingness to stock specific prescription opioids due to fear of robbery or diversion. It was hypothesized that pharmacists who perceived prescription drug abuse to be problematic or those who had previous experiences with diversion may have more positive intentions to utilize the database. The scale total for PPDA was positive and moderately high (mean = 13.4±2.7; range = 4 to 20) which indicated that pharmacists' somewhat agreed that prescription drug abuse was problematic. The bivariate correlations with PPDA and intention, as well as with the other predictor variables were statistically significant, however the correlations were fairly weak. More importantly, when included with the other TPB constructs, PPDA did not emerge as a significant predictor of high intention. The scale reliability was 0.6, and some inter-item correlations were below 0.5, which may indicate that PPDA scale may need modifications for better reliability.

6.5.2 PHARMACISTS' PERCEIVED MORAL OBLIGATION

In a review of TPB using perceived moral obligation (PMO), 9 of 11 studies reported PMO significantly improved prediction of intention after accounting for the other TPB variables (A, SN, PBC) (Conner & Armitage, 1998). In this study, the scale was constructed with two items, asking pharmacists about their perceived moral obligation and professional obligation. Pharmacists in our study reported a moderately high sense of obligation towards high intention to utilize the PDMP (scale total = 8.7±1.5; possible range 2 to 10). Similar to other studies using PMO, the perceived

obligation measure contributed significantly to predicting high intention, beyond that of the TPB model constructs of A, SN, and PBC.

Gavaza et al. (2011) also found that perceived moral obligation contributed to a significant amount of explained variance regarding pharmacists' intention to report serious adverse effects to the FDA. Asking pharmacists about their professional obligation may prove to be a useful measure for future studies involving pharmacists and issues of an ethical nature. Educational materials and online training guidance for pharmacists regarding PDMP utilization should contain language that appeals to pharmacists' moral and professional obligation. If pharmacists' high intention is increased based on perceived obligation, utilization (i.e., behavior) may be higher.

Training and awareness of PDMPs among pharmacists and other health care providers has been recognized as a weakness of many programs (Barrett & Watson, 2005; Blumenschein, K., et al., 2010; Feldman et al., 2011; Sorg, 2009; Ulbrich, et al., 2010). This may be a function of budgetary constraints that have plagued most states (Center for Lawful Access and Abuse Deterrence, 2011; Emerick, 2010). However, for successful implementation of the online PDMP in Texas, marketing materials that evoke ethical and professional obligations are recommended.

6.6 DEMOGRAPHIC AND PRACTICE CHARACTERISTICS

Demographic variables and practice characteristics were examined in the context of the TPB determinants of intention (A, SN, and PBC). In prior studies using the TPB in studying pharmacists' activities, demographic variables have been examined to determine

their impact on intentions (Coleman, 2003; Gavaza, et al., 2011; Herbert, et al., 2006; Pradel, Obeidat, & Tsoukleris, 2007). Only the Coleman study found any significance related to practice characteristic variables (prescriptions written per day, non-chain pharmacy, hours worked per day, and years in practice). Regarding demographics (i.e., age, gender, race/ethnicity), only gender was significantly related to any of the study constructs. Regarding practice characteristics (i.e., gender, years of community pharmacy experience, practice location, race/ethnicity), only gender and years of community pharmacy experience were significantly related. Below is a discussion of the variables with significant relationships.

6.6.1 GENDER

With respect to attitude and subjective norm (both direct and indirect measures) and direct PBC, no significant differences were found with gender. However, results of indirect PBC weighted beliefs (control beliefs x perceived power) showed that women perceived significantly less control than men regarding several issues: user friendly website, PDPM interfaced with software, quick access/fast search results, insurance compensation/reimbursement and accuracy of information.

The differences observed in the indirect PBC beliefs, may illustrate a gender difference in level of control in pharmacy practice. Most of the items are related to the computer or website and perhaps more men are interested in and have more knowledge concerning computer technology that would lead them to feel more control related to the PDMP. Conversely, the other significant beliefs were on insurance compensa-

tion/reimbursement and accuracy of information. Again, women exhibited less control in these areas, but no speculation as to the reasons why can be offered without further research. Education and proper promotion of the Texas PDMP may prove pivotal to utilization, especially among women. DPS may also consider partnering with the Texas Pharmacy Association (TPA) and other pharmacy organizations to provide continuing education and training to pharmacists.

6.6.2 YEARS OF COMMUNITY PHARMACY EXPERIENCE

No significant correlations were observed between years of pharmacy practice experience and A and SN (both direct and indirect measures) or direct PBC. However, indirect PBC showed a statistically significant positive correlation between years of community practice experience and PBC ($r = 0.16$, $p = 0.01$). This finding seems reasonable considering that pharmacy students do not receive much training related to prescription drug diversion and often times this "on the job" training is necessary to recognize warning signs of patient diversion (Bollinger, et al., 2005).

6.7 EVALUATION OF STUDY MODEL

The TPB model was used to measure pharmacists' intention to utilize a PDMP when the validity of the prescription/patient need is in question. One way to assess the usefulness of the study model is to examine the percent of variance explained by the model or R^2. Gavaza et al. (2011) found that the TPB explained 34.0 percent of the variance in pharmacists' intentions to report serious adverse events to the Food and Drug

Administration. Likewise, Herbert et al. (2006) conducted a study of pharmacists' intentions to provide medication therapy management and found that all three variables (A, SN, and PBC were significant at $p < 0.05$) of the TPB explained 63.2 percent of the variance in intention.

In addition to explanatory power as noted above, another way to assess the model's utility is by examining model p-values. Because logistic regression was used in this study, R^2 values are not available. However, in this study, the TPB model was useful in predicting pharmacists' high intention as supported by highly significant models: direct measures—Model $X^2 = 91.12$, df =3, $p < 0.001$; indirect measures—Model $X^2 = 46.39$, df =3, $p < 0.001$). In addition, all three constructs significantly predicted high intention at the $p < 0.01$ level, A (OR = 1.8, 95% CI = 1.2 – 2.8), SN (OR = 2.19, 95% CI = 1.4 – 3.3), and PBC (OR = 1.9, 95% CI = 1.2 – 3.0), with SN emerging as the strongest predictor.

In a review of the healthcare professionals' intentions and behaviors, the most significant predictors of intention were beliefs about capabilities and consequences, as well as social influences (Godin, et al., 2008). Upon review of the results of this study in comparison to others, SN emerges as the strongest predictor of pharmacists' intention. Pharmacists, perhaps more so than other healthcare professionals, may feel more pressure from regulatory agencies to perform specific behaviors to benefit patients or to satisfy regulatory requirements (Planas et al., 2005). Gavaza et al. (2011) (reporting serious ADEs) and Herbert et al. (2006) (performing MTM) both found that SN (direct measure) was the strongest predictor of pharmacists' intention.

Pharmacists as part of their professional mandate from the DEA have to follow the federal laws pertaining to CPD dispensing (Drug Enforcement Administration Office of Diversion Control, 2010). Furthermore, pharmacists must stay abreast of their respective state laws to avoid violations. Additionally, pharmacy is one of the few professions where a state pharmacy board inspector can conduct an audit without prior notice (Bernacchi, 1999). Lastly, the Texas PDMP program is administered by the Department of Public Safety, a law enforcement agency. These factors may explain why subjective norm is a strong predictor of pharmacists' intention related to behaviors that have some element of compliance with state pharmacy regulations (e.g., patient counseling).

Additionally, our study showed that the perceived obligation construct was significantly related to pharmacists' high intention above and beyond that explained by the TPB. Therefore, future research of pharmacists' intention to utilize PDMPs should incorporate an enhanced TPB+PO model.

6.8 STUDY LIMITATIONS

The results of this study must be interpreted in light of a number of limitations. The most obvious limitation of this study is that pharmacists did not have online access to the Texas PDMP. Thus, they were responding to a 'hypothetical' program and their responses may differ once they are exposed to the actual online program. Online availability is projected for August, 2012 (S Wright, personal communication, June 4, 2012). Although, this limitation prevents us from knowing the beliefs associated with

actual utilization of the PDMP, pharmacists have many experiences such as locating provider information online to have a strong sense of how the PDMP would work in their pharmacy "in general."

Furthermore, response bias is evident, considering only three respondents reported negative intention. Additionally, due to the anonymous nature of the questionnaire, nonresponse bias could not be assessed. Based on some positive responses to potentially negative consequences (e.g., decrease in pharmacy profitability is good), response set bias may have occurred. Also, it could have been that only those pharmacists that recognized the potential value of utilizing a PDMP or those who had previous negative experiences dispensing CPDs were the primary survey respondents. In addition, the response rate was relatively low (26.2%), and due to the unique variability in pharmacy laws from state to state, the results of this study may not be generalizable outside of Texas.

First, this study data was collected via self report and some pharmacists may have been influenced by social desirability; however, the study was anonymous to mitigate this threat. Second, pharmacists did not seem hesitant to share their views as was evident by the numerous open ended comments that were provided. Third, the cross-sectional study design does not allow measuring any changes in pharmacists' intention, attitude, subjective norm or perceived behavioral control. Once the Texas PDMP is online accessible, some of the measured constructs may change. Fourth, the questionnaire was developed by the principal investigator with no expert check, which may have biased some of the modal salient belief categories. Lastly, causality cannot be inferred.

6.9 STUDY IMPLICATIONS AND FUTURE RESEARCH

This study has several implications to be noted. Considering the epidemic of prescription drug abuse, it becomes imperative to understand how health care professionals, especially pharmacists plan to utilize PDMP data. Pharmacists working in busy environments may not recognize the value of utilizing PDMP data in the course of patient care, or some pharmacists may be apathetic to the problems associated with CPD misuse. Although physicians have access to the PDMP data, there is currently no state mandate requiring physicians to access the PDMP data prior to writing a prescription. This in turn, makes the pharmacist responsible for ensuring that CPDs are appropriately dispensed to the public. Pharmacists are in a position to provide appropriate care to patients. There are many instances, such as surgery, cancer and chronic pain in which opioids are appropriate for patients (Altman & Smith, 2010; Forbes et al., 1994; Zeppetella, 2008). Pain is one of the main reasons that patients seek medical care, however, under treatment and barriers to opioids exist for some patients (Johannes et al., 2010; Green et al., 2002). Therefore, it is critical that pharmacists and prescribers obtain the necessary training in pain management to avoid stigmatizing patients receiving opioid therapy and to ensure that the PDMPs do not create another barrier to appropriate opioid therapy.

More importantly, pharmacists could help decrease demand by interviewing and educating patients when aberrant controlled medication use is observed in the PDMP database. PDMPs, without active involvement from prescribers and pharmacists will most likely be useful for law enforcement (e.g., DEA) to control supply, but may be regarding impact on demand. Also, pharmacists and pharmacy students will need further education to address patients that have been identified with aberrant controlled medication use.

Pharmacist had favorable A and SN perceptions toward PDMP utilization. Based on this information, it may be helpful for the Texas DPS to provide pharmacists with training materials for PDMP registration and utilization, which will positively impact A and SN. Providing pharmacists with some direction regarding what to do with patients identified with aberrant CPD behavior may also influence both A and SN. Furthermore, language in educational and awareness materials aimed at pharmacists should appeal to their perceived obligation (e.g., reminder of Oath of a Pharmacist).

Future research should be aimed at evaluating pharmacists' intention after the Texas program is available for online access. After which, pharmacists can better assess the barriers related to PDMP utilization, such as difficult registration process or complicated passwords required for log-in. More importantly, pharmacists' perceived behavioral control (PBC) may be influenced by the aforementioned barriers, and thus will need to be reassessed at that time. Moreover, we can measure pharmacists' reported behaviors related to PDMP utilization to determine the correlation between intention and behavior and the prediction of behavior regressed on intention and PBC.

In addition, once the online program is made available, the websites' user friendliness and speed will likely influence pharmacists' intention and behavior. If the Texas PDMP database is slow and prone to shutdowns, then pharmacists are more likely to develop negative attitudes toward utilization. Moreover, researchers must determine the reasons for nonresponse biases related to PDPM surveys. Information from nonresponders may help identify whether there is a gap in pharmacists' attitudes (e.g., pharmacists' apathy) or a mischaracterization of the impact of prescription drug abuse on pharmacy. Chiefly, CPDs represent a significant financial resource for some independent pharmacy owners, chain pharmacies, and wholesalers (ABC News, 2012). More research is needed to determine whether these groups truly support PDMP implementation. Considering lack of internet access has been cited numerous times in surveys of pharmacists (Blumenschein, K., et al., 2010; Sorg, 2009; Ulbrich, et al., 2010), as a primary reason for not registering, the lack of employer support should be studied.

6.10 RECOMMEDATIONS FOR TEXAS PDMP

Previous survey research involving pharmacists' evaluations of PDMPs has yielded a few consistent results that s may help guide all involved in developing, promoting and marketing the PDMP in Texas. First, the online web portal should be efficient and user friendly. Second, passwords should not be overly complex, where they serve as barriers to PDMP access. Since SN was the strongest predictor and pharmacists indicated strong willingness to comply with regulatory agencies, registration should be mandatory upon new license applications or license renewals. Moreover, education and training ma-

terials should be provided to pharmacists and also made available on the TSBP website for quick reference. Partnering with academic researchers is recommended to allow for epidemiological analysis of PDMP data, which will help the state target its resources to those areas most critically impacted by prescription drug abuse.

6.11 CONCLUSION

The TPB was shown to be a good model to predict pharmacists' high intentions to utilize a PDMP database. Pharmacists' held favorable attitudes, positive subjective norms, and expressed a neutral perceived behavioral control. Also the perceived obligation construct was shown to add to the prediction of pharmacists' high intention. Among demographic variables, women expressed less indirect PBC towards PDMP utilization, which may need to be addressed, considering that female pharmacists outnumber male pharmacists in Texas.

This was the first study to examine pharmacists' high intention in the context of a theoretical model, regarding intention to use a PDMP database. Recognition of the constructs that most influence pharmacists' intention to utilize the PDMP may lead to greater utilization, which may lead to more appropriate CPD therapy management, while preventing morbidity and mortality associated with misuse. From the comments provided in the open ended items, it is evident that the majority of pharmacists in our study were committed to preventing diversion, regardless of the extra time needed to investigate patients' controlled medication histories. Furthermore, developing interventions, as well as pharmacist and pharmacy student education concerning PDPMs,

based on the TPB could lead to increased utilization among pharmacists. More importantly, pharmacists' SN was a strong predictor of high intention, which may indicate that a legal mandate requiring PDMP registration and perhaps utilization may be warranted.

APPENDIX A: TEXAS PRESCRIPTION PROGRAM DATA REQUEST FORM

TEXAS PRESCRIPTION PROGRAM
INFORMATION REQUEST FORM

Fill in all the applicable information. Return completed form to Texas Prescription Program, P. O. Box 4087, Austin, TX 78773-0439 or fax to 512/424-7178 or 512/424-5373.

REQUESTOR INFORMATION:

Title Name

Address City State Zip

Work Telephone Fax Telephone

DPS Registration # DEA Registration # Board License #

SUBJECT OF REQUEST:

Complete Name (name of Business or Subject Name) DOB (if a subject)

Other Name Variations

Identifying Numbers (DL, SSN, Other) Registrant (BD Lic#, DPS#, DEA#)

List all address possibilities:

Address City State Zip

Address City State Zip

Address City State Zip

TYPE OF REQUEST
(check one)

Prescribing History (Doctors requesting their own prescribing history) _____
Dispensing History (Pharmacies requesting their own dispensing history) _____

Patient History (information available to practitioner's on an established patient only) _____

Date range: _____ to _____ (patient data available for the most recent three month period)

Purpose of Request:

I certify that the information is requested in compliance with 481.076 of the Texas Controlled Substances Act.

Original signature of requestor Date
(rubber stamp signatures not valid)

TP-11 *(Rev. 04-09)*

APPENDIX B: FOCUS GROUP INVITATION

Focus Group Invitation

Dear Pharmacist Colleague,
You have been selected to participate in a focus group conducted as part of research study entitled: "*A qualitative analysis of the attitudes and beliefs of Texas pharmacists toward utilizing an online prescription drug monitoring program (PDMP) database when the validity of a prescription/patient need is in question*."

The steady rise in prescription drug diversion and abuse has prompted many states to create PDMPs. In some states these PDMPs have been made online accessible to physicians and pharmacists for reviewing a patients' controlled prescription drug history prior to prescribing or dispensing. To date, no research has focused on how pharmacists' beliefs and attitudes toward utilizing an online database correlate with their intention to utilize an online PDMP database.

This focus group is part of a dissertation research project being conducted at The University of Texas at Austin, College of Pharmacy. We anticipate 8 to 10 pharmacists will participate in this focus group. This focus group will determine the advantages and disadvantages of utilizing an online PDMP by pharmacists, the factors that would make it easier or difficult to utilize an online PDMP as well as the individuals or groups who would approve or would not approve pharmacists utilizing an online PDMP.

Because you are one of a small group of people selected for this study, we hope that you will choose to participate so that our results will be representative of Texas pharmacists. Your decision to participate or not will not affect your present or future relationship with The University of Texas at Austin, College of Pharmacy. Your participation in this study is voluntary.

The focus group is expected to last approximately 1 – 1 1/2 hours. The focus will be conducted at [venue, address] at [time] on the [date]. Risks to participants are considered minimal. Sessions will be audio-taped. However, the tapes will:

- be coded so that no personally identifying information is visible on them;
- be kept in a secure place (e.g., a locked file cabinet in the investigator's office);
- be heard or viewed only for research purposes by the investigator and his or her associates;
- be destroyed after they are transcribed or coded.

If you have any questions, please do not hesitate to contact us by phone at (512) 471-5605 and (512) 471-5612 or e-mail mfleming@mail.utexas.edu or jbarner@mail.utexas.edu. If you have questions about your rights as a research participant, complaints, concerns, or questions about the research please contact James Wilson, Ph.D., Chair, The University of Texas at Austin Institutional
Review Board for the Protection of Human Subjects at (512) 232-2685 or the Office of Research Support at (512) 471-8871 or email: orsc@uts.cc.utexas.edu.

Thank you in advance for your time and cooperation in participating in this important study. If you agree to participate, please let us know via e-mail or phone.

Sincerely,

Marc L. Fleming, R.Ph., M.S., M.P.H.
Ph.D. Candidate
Division of Health Outcomes & Pharmacy Practice

Jamie C. Barner, R.Ph., Ph.D.
Professor and Dissertation Advisor
Division of Health Outcomes & Pharmacy Practice

APPENDIX C: INFORMED CONSENT FORM

IRB APPROVED: 10/27/2011 **EXPIRES ON: 10/26/2012**

Consent for Participation in Research

Title: A qualitative study of pharmacists' behavioral, normative, and control beliefs toward utilizing an online prescription drug monitoring database when dispensing controlled prescription drugs.

The purpose of this form is to provide you information that may affect your decision as to whether or not to participate in this research study. The person performing the research will answer any of your questions. Read the information below and ask any questions you might have before deciding whether or not to take part. If you decide to be involved in this study, this form will be used to record your consent.

Purpose of the Study
You have been asked to participate in a research study about pharmacists' beliefs regarding online prescription drug monitoring program databases. The purpose of this study is to better understand the advantages and disadvantages of utilizing an online PDMP database when the validity of a controlled prescription drug or patient need is in question. We also would like to identify the individuals or groups who would approve or would not approve of you utilizing an online PDMP database when the validity of the prescription or patient need is in question. The study will also discuss the factors that would make it easier or difficult for you to utilize an online PDMP.

What will you to be asked to do
If you agree to participate in this study, you will be asked to:
- Discuss your beliefs regarding online prescription drug monitoring programs (PDMPs); and
- Participate in a focus group discussion; and
- Respect and protect the confidentiality of the other participants in this focus group.

The study will take approximately one to one-half hours to complete and may include up to ten participants.
Your participation will be audio recorded.

Risks involved in this study
Loss of confidentiality - The researchers will protect the confidentiality of all participants in this focus group by using pseudonyms when transcribing data from the discussion. The tapes will be kept locked in the principal investigator's office. After they have been transcribed, the tapes will be destroyed. The research may involve risks that are unanticipated. If you wish to discuss the information above or any other risks you may experience, you may ask questions now or call the Principal Investigator listed on the front page of this form.

What are the possible benefits of this study
You will receive no direct benefit from participating in this study; however, society may benefit from the knowledge gathered the focus group. There is the possibility of furthering your knowledge of prescription drug monitoring programs.

Will there be any compensation?
You will receive a $25.00 gift card for your participation.

Confidentiality or privacy protections
If you choose to participate in this study, you will be audio recorded. Any audio recordings will be stored securely and only the research team will have access to the recordings. Once the recordings have been transcribed they will be destroyed. This study is confidential and no names will be associated with data collected from the focus group session. All audio tapes will be void of any personally identifying information or marks by using pseudonyms for each study participant prior to the start of tape recording. Any publications resulting from this study will exclude any information that will make it possible to identify any person in the study. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

Contacts and questions
Prior, during or after your participation you can contact the researcher Marc Fleming at 512-471-5605 or send an email to mfleming@mail.utexas.edu. This study has been reviewed and approved by The University Institutional Review Board and the study number is [2011-09-0146]. If you have questions concerning your rights as a research participant or any dissatisfaction with any part of this study, you can contact, anonymously if you wish, the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu.

Signature
You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time. You voluntarily agree to participate in this study. By signing this form, you are not waiving any of your legal rights.

_____ I agree to be audio recorded.
_____ I do not want to be audio recorded.

_____
Printed Name

_____ _____
Signature Date

As a representative of this study, I have explained the purpose, procedures, benefits, and the risks involved in this research study.

_____
Print Name of Person obtaining consent

_____ _____
Signature of Person obtaining consent Date

APPENDIX D: FOCUS GROUP MODERATOR GUIDE

Focus Group Moderator Guide

Hello, my name is Marc Fleming and I will be the moderator for this focus group session. The purpose of this focus group session is to identify your beliefs regarding the utilization of the Texas Prescription Drug Monitoring Program (PDMP) and to identify individuals or groups that would approve or disapprove of pharmacists utilizing the Texas PDMP. Additionally we want to identify factors that would help or prevent pharmacists from utilizing the PDMP. The information obtained from this focus group 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 recording during the focus group session ensures that all the important information is captured and available for inclusion in the final questionnaire. 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 on to one and a half hours and you have the right to stop participating at any time.

Group Rules

As the session 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 to move forward in the interest of time. It is important that everyone feels comfortable and at ease during the discussion. There is no right or wrong answer to any of the questions. You are encouraged to speak freely about the issues discussed as everyone's input is valuable to the discussion.

Explanation of an online PDMP

In some states a patient's controlled prescription drug (CPD) history is available via a secure online website. Some of the recent changes in the Texas Department of Public Safety's requirements for reporting controlled drug data are associated with the future online access for pharmacists. In the near future, pharmacists in Texas will have the capability to access a patients' state CPD profile prior to dispensing a prescription. From this point forward, I will refer to this type of online database as a Prescription Drug Monitoring Database or a PDMP.

General Question

Briefly tell me what you think about when you think of utilizing an online PDMP database when the validity of the prescription/patient need is in question.

Key Questions

1. What do you believe are the *advantages* of utilizing an online PDMP database when the validity of the prescription/patient need is in question?

2. What do you believe are the *disadvantages* to utilizing an online PDMP database when the validity of the prescription/patient need is in question?

3. What else comes to mind when you think about utilizing an online PDMP database when the validity of the prescription/patient need is in question?

4. Are there any individuals or groups who would approve of pharmacists utilizing an online PDMP database when the validity of the prescription/patient need is in question?

5. Are there any individuals or groups who would *disapprove* of your utilizing an online PDMP database when the validity of the prescription/patient need is in question?

6. Are there any other individuals or groups who would approve or disapprove of your utilizing an online PDMP database when the validity of the prescription/patient need is in question?

7. What circumstances would *enable* you to utilize an online PDMP database when the validity of the prescription/patient need is in question?

8. What circumstances would make it *difficult* for you to utilize an online PDMP database when the validity of the prescription/patient need is in question?

9. Are there any other issues that come to mind when you think about utilizing an online PDMP database when the validity of the prescription/patient need is in question?

APPENDIX E: PRE-NOTICE POSTCARD

COLLEGE of PHARMACY

THE UNIVERSITY OF TEXAS AT AUSTIN

Dear Texas Pharmacist,

I am writing to ask for your help with an important study being conducted by the University of Texas, College of Pharmacy to understand pharmacists' beliefs and intentions related to utilizing the Texas controlled substance prescription database. In the very near future (anticipated Summer 2012) the Texas Department of Public Safety (DPS) will allow pharmacists online access to patients' controlled substance prescription medication histories. Accessing this data may be helpful in preventing doctor shopping and abuse, as well as ensuring appropriate access to patients in need of these medications.

In the next few days you will receive a request to participate in an anonymous mail survey about your attitudes and views related to utilizing the Texas DPS controlled substance database prior to dispensing controlled medications.

This research can only be successful with the generous help of people like you. I hope that you will take 15 minutes of your time to help us. Most of all, I hope that you enjoy the questionnaire and the opportunity to voice your thoughts on a topic that will likely impact the way pharmacy is practiced in Texas. If you have any questions about the survey, please do not hesitate to contact us by phone at (512) 471-5605 or (512) 471-5612 or e-mail mfleming@mail.utexas.edu or jbarner@mail.utexas.edu.

Best Wishes,

Marc L. Fleming, R.Ph., M.S.
Ph.D. Candidate

Jamie C. Barner, R.Ph.,
Professor and Dissertation Advisor

APPENDIX F: SURVEY INSTRUMENT

SURVEY BOOKLET

Survey of Pharmacists' Perceptions Regarding Utilization of the Texas Prescription Drug Monitoring Program (PDMP) Database

In the very near future, the Texas Department of Public Safety (DPS) will provide pharmacists with access to patients' controlled medication data via the Texas **Prescription Drug Monitoring Program (PDMP)**. Information most likely available to you will include: patient name, date of birth, address, drug name, dosage, dispensing dates, pharmacy and prescriber information. We are interested in factors that would influence your intention to utilize the Texas PDMP database when it becomes available to you via a secure password protected website. When you receive prescriptions for controlled medications, we are interested in those instances when you:

- Suspect a prescription is fraudulent or have questions about the patient-doctor relationship.

  -Referred to in the questionnaire as PRESCRIPTION VALIDITY.
- Want to confirm a legitimate medical need for the prescription or you suspect patient abuse or addiction.

  -Referred to in the questionnaire as PATIENT NEED.

Please consider both VALIDITY of the prescription, as well as PATIENT NEED (as described above) when completing the survey below.

For each item below (e.g., 1a, 1b, etc.) please circle the number that corresponds to your choice using the scales listed.

INTENTIONS

1. When the validity of the prescription for controlled medication/patient need is in question…

a. I intend to utilize the PDMP database	**Extremely unlikely**			**Neutral**			**Extremely likely**
	-3	-2	-1	0	1	2	3
b. I will try to utilize the PDMP database	**Definitely false**			**Neutral**			**Definitely true**
	-3	-2	-1	0	1	2	3
c. I plan on utilizing the PDMP database	**Strongly disagree**			**Neutral**			**Strongly agree**
	-3	-2	-1	0	1	2	3

PERCEPTIONS

2. When the validity of the prescription for controlled medication/patient need is in question, ***my utilizing the PDMP is***

a.	**Bad**			**Neutral**			**Good**
	-3	-2	-1	0	1	2	3
b.	**Inconvenient**			**Neutral**			**Convenient**
	-3	-2	-1	0	1	2	3
c.	**Harmful**			**Neutral**			**Beneficial**
	-3	-2	-1	0	1	2	3
d.	**Worthless**			**Neutral**			**Valuable**
	-3	-2	-1	0	1	2	3
e.	**Useless**			**Neutral**			**Useful**
	-3	-2	-1	0	1	2	3

Proceed to next page 

For each item below (e.g., 3a, 3b, etc.) please circle the number that corresponds to your choice using the scales listed.

3. When the validity of the prescription for controlled medication/patient need is in question…

a. Most people who are important to me think that I _____utilize the PDMP.	**Should not** -3	-2	-1	0	1	2	**Should** 3
b. The pharmacists whose opinions I value would _____ the PDMP.	**Not utilize** -3	-2	-1	0	1	2	**Utilize** 3
c. I am confident that I could utilize the PDMP.	**Strongly disagree** -3	-2	-1	**Neither agree nor disagree** 0	1	2	**Strongly agree** 3
d. The decision to utilize the PDMP is not entirely up to me.	**Strongly disagree** -3	-2	-1	**Neither agree nor disagree** 0	1	2	**Strongly agree** 3
e. For me to utilize the PDMP would be…	**Difficult** -3	-2	-1	**Neither easy nor difficult** 0	1	2	**Easy** 3

Please circle the number that corresponds to your choice using the scale listed below.

	Strongly disagree		**Neither agree nor disagree**		**Strongly agree**
4. Prescription drug abuse is a significant problem in my pharmacy.	1	2	3	4	5
5. Prescription drug abuse is the result of physicians' overprescribing controlled prescription drugs.	1	2	3	4	5
6. There is a significant problem with patients abusing controlled prescription medications.	1	2	3	4	5
7. When a patient presents at my pharmacy with a prescription for a controlled medication, I always think it is for purposes of abuse.	1	2	3	4	5
8. I am concerned about abuse when a patient requests a brand name controlled medication.	1	2	3	4	5
9. I believe that it is my **moral obligation** to utilize the PDMP when the validity of the prescription for a controlled medication/patient need is in question.	1	2	3	4	5
10. I believe that it is my **professional obligation** to utilize the PDMP when the validity of the prescription for a controlled medication/patient need is in question.	1	2	3	4	5
11. I support a statutory requirement ***for pharmacists*** to check a patient's prescription history using the PDMP.	1	2	3	4	5
12. I support a statutory requirement ***for prescribers*** to check a patient's prescription history using the PDMP.	1	2	3	4	5
13. When faced with uncertainty regarding a controlled medication, I tend to fill the prescription.	1	2	3	4	5
14. I am reluctant to report a physician for controlled	1	2	3	4	5

medication prescribing that I believe is inappropriate.

Proceed to next page

PERCEPTIONS ABOUT POTENTIAL OUTCOMES OF PDMP

Next, we would like to determine your beliefs about utilizing the Texas controlled prescription medication database. Please circle the number that corresponds to your choice using the scales listed below.

15. How **likely** do you think the following **outcomes** will be if you utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

	Very unlikely			Neutral			Very likely
a. Decrease doctor shopping	-3	-2	-1	0	1	2	3
b. Deny controlled medication based on inaccurate data in the PDMP	-3	-2	-1	0	1	2	3
c. Decrease diversion of controlled medication	-3	-2	-1	0	1	2	3
d. Violate patient privacy (HIPAA)	-3	-2	-1	0	1	2	3
e. Increase risk of pharmacist liability	-3	-2	-1	0	1	2	3
f. Consume too much time to access data	-3	-2	-1	0	1	2	3
g. Improve appropriate controlled medication use	-3	-2	-1	0	1	2	3
h. Decrease pharmacy hopping (i.e., using multiple pharmacies)	-3	-2	-1	0	1	2	3
i. Decrease pharmacy profitability	-3	-2	-1	0	1	2	3

16. 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 utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

	Extremely bad			Neutral			Extremely good
a. Decrease doctor shopping	-3	-2	-1	0	1	2	3
b. Deny controlled medication based on inaccurate data in the PDMP	-3	-2	-1	0	1	2	3
c. Decrease diversion of controlled drugs	-3	-2	-1	0	1	2	3
d. Violate patient privacy (HIPAA)	-3	-2	-1	0	1	2	3
e. Increase risk of pharmacist liability	-3	-2	-1	0	1	2	3
f. Consume too much time to access	-3	-2	-1	0	1	2	3

data							
g. Improve appropriate controlled medication use	-3	-2	-1	0	1	2	3
h. Decrease pharmacy hopping (i.e., using multiple pharmacies)	-3	-2	-1	0	1	2	3
i. Decrease pharmacy profitability	-3	-2	-1	0	1	2	3

Proceed to next page 

PERCEPTIONS AND INFLUENCE OF INDIVIDUALS OR GROUPS

Next we are interested in what **individuals or groups** would influence your intention to utilize the PDMP. Please circle the number that corresponds to your choice using the scales listed below.

17. How likely is it that each of the following **individuals or groups** would think that you should utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

	Very unlikely			Neutral			Very likely
a. Regulatory agencies/law enforcement (e.g., TSBP, DPS, DEA)[a]	-3	-2	-1	0	1	2	3
b. Pharmacy owners/employers	-3	-2	-1	0	1	2	3
c. Prescribers (e.g., MD, NP, PA)[b]	-3	-2	-1	0	1	2	3
d. Patients	-3	-2	-1	0	1	2	3
e. Patient privacy advocates	-3	-2	-1	0	1	2	3
f. Pharmaceutical manufacturers/wholesalers	-3	-2	-1	0	1	2	3
g. Other pharmacists	-3	-2	-1	0	1	2	3

[a]TSBP-Texas State Board of Pharmacy; DPS-Texas Department of Public Safety; DEA-Drug Enforcement Administration
[b]MD-Medical Doctor; NP-Nurse Practitioner; PA- Physician Assistant

18. Generally speaking, how likely are you to do what the following **individuals or groups** would want you to do when it comes to utilizing the PDMP when the validity of the prescription for controlled medication/patient need is in question?

	Very unlikely			Neutral			Very likely
a. Regulatory agencies/law enforcement (e.g., TSBP, DPS, DEA)[a]	-3	-2	-1	0	1	2	3
b. Pharmacy owners/employers	-3	-2	-1	0	1	2	3
c. Prescribers (e.g., MD, NP, PA)[b]	-3	-2	-1	0	1	2	3
d. Patients	-3	-2	-1	0	1	2	3
e. Patient privacy advocates	-3	-2	-1	0	1	2	3
f. Pharmaceutical manufacturers/wholesalers	-3	-2	-1	0	1	2	3
g. Other pharmacists	-3	-2	-1	0	1	2	3

[a]TSBP-Texas State Board of Pharmacy; DPS-Texas Department of Public Safety; DEA-Drug Enforcement Administration
[b]MD-Medical Doctor; NP-Nurse Practitioner; PA-Physician Assistant

Proceed to next page 

PDMP CONTROL FACTORS

Next, we are interested in what factors would make it **easy or difficult** for you to utilize the PDMP. Please circle the number that corresponds to your choice using the scales below.

19. How **easy or difficult** will the following factors make it for you to utilize the PDMP when the validity of the prescription for controlled medication/patient need is in question?

	Very difficult			**Neutral**			**Very easy**
a. User friendly web site (database)	-3	-2	-1	0	1	2	3
b. PDMP interfaced/connected to pharmacy prescription filling software	-3	-2	-1	0	1	2	3
c. Quick access/fast search results	-3	-2	-1	0	1	2	3
d. Employer support/approval	-3	-2	-1	0	1	2	3
e. Lack of time to search PDMP (e.g., workflow issues)	-3	-2	-1	0	1	2	3
f. Insurance compensation/reimbursement for querying the PDMP	-3	-2	-1	0	1	2	3
g. Accuracy of information	-3	-2	-1	0	1	2	3
h. Patient retaliation for refusal to dispense controlled medication	-3	-2	-1	0	1	2	3

20. How much **control** do you feel you have over the following factors when it comes to utilizing the PDMP when the validity of the prescription for controlled medication/patient need is in question?

	No control			**Neutral**			**Complete control**
a. User friendly web site (database)	-3	-2	-1	0	1	2	3
b. PDMP interfaced/connected to pharmacy prescription filling software	-3	-2	-1	0	1	2	3
c. Quick access/fast search results	-3	-2	-1	0	1	2	3
d. Employer support/approval	-3	-2	-1	0	1	2	3
e. Lack of time (e.g., workflow issues)	-3	-2	-1	0	1	2	3
f. Insurance compensation/reimbursement for querying the PDMP	-3	-2	-1	0	1	2	3
g. Accuracy of information	-3	-2	-1	0	1	2	3
h. Patient retaliation for refusal to dispense controlled medication	-3	-2	-1	0	1	2	3

21. For each item below, please estimate the number of hours of training or continuing education you have received ***in the past five years***.

Training or continuing education	***Please circle the number of hours that best corresponds to your answer.***				
a. Identifying prescription drug abuse/addiction	0	1-3	4-6	7-9	≥10
b. Preventing prescription drug diversion	0	1-3	4-6	7-9	≥10
c. Pain management	0	1-3	4-6	7-9	≥10

Proceed to next page

PHARMACISTS' ACTIONS

Next, we would like to know how you generally handle situations related to suspected diversion, abuse, and dispensing of controlled prescription medications in your pharmacy.

22. How often would the following trigger you to utilize the PDMP database?

	Never		**Sometimes**		**Always**
a. New patient	1	2	3	4	5
b. Patient prefers to pay cash	1	2	3	4	5
c. Mistakes or irregularities in the written prescription	1	2	3	4	5
d. Refill request that is too early	1	2	3	4	5
e. *Please list any other triggers*					

23. When you are dispensing a controlled prescription medication, how often do you perform the following tasks?

	Never		**Sometimes**		**Always**
a. Consult patient records that you have access to before dispensing the drug	1	2	3	4	5
b. Validate the prescriber's DEA number	1	2	3	4	5
c. Ask if the patient is taking any other controlled medications	1	2	3	4	5
d. Verify the identification of patients prior to dispensing prescriptions for controlled medications	1	2	3	4	5
e. Discuss treatment with buprenorphine (Subutex®) or buprenorphine/naloxone (Suboxone®) with patients or prescribers if you suspect opioid addiction	1	2	3	4	5
f. *Please list any other tasks*					

24. If you suspected a patient of abusing controlled drugs, you would…

	Strongly disagree		**Neither agree nor disagree**		**Strongly agree**
a. Notify law enforcement	1	2	3	4	5

b. Refuse to fill the prescription	1	2	3	4	5
c. Call the prescriber	1	2	3	4	5
d. Document the incident	1	2	3	4	5
e. Counsel patient about addiction	1	2	3	4	5

	Strongly disagree		**Neither agree nor disagree**		**Strongly agree**
25. Opioid addiction should be managed by pharmacists similar to other chronic diseases (e.g., hypertension)?	1	2	3	4	5

DEMOGRAPHIC/PRACTICE CHARACTERISTICS

Finally, we would like to know a little about you and your practice setting. Please check the response or write in your responses where appropriate.

26. What is your gender? ☐ Female ☐ Male

27. What year were you born? _____

Proceed to next page

28. Which of the following best describes your ethnic/racial background? *Please check all that apply.*
    - ☐ African American/non-Hispanic Black
    - ☐ American Indian or Alaska Native
    - ☐ Asian American/Pacific Islander
    - ☐ Caucasian/non-Hispanic White
    - ☐ Mexican American/Hispanic
    - ☐ Other (please specify): _____

29. What is your *highest level* of pharmacy education?
    - ☐ B.S. Pharmacy
    - ☐ M.S. Pharmacy or Residency
    - ☐ Pharm.D.
    - ☐ Other (please specify): _____

30. Which of the following best describes your current primary practice setting?
    - ☐ Community Independent (3 or fewer stores under common ownership)
    - ☐ Community Chain (4 or more stores under common ownership; e.g., CVS, Walgreens)
    - ☐ Grocery Store Chain (e.g., Kroger, HEB)
    - ☐ Mass Merchandiser (e.g., Target, Walmart)
    - ☐ Outpatient/Clinic Pharmacy
    - ☐ Other (please specify): _____

31. On average, how many prescriptions does your pharmacy fill per day?
    _____ prescriptions per day

32. Does your pharmacy have internet access?
    - ☐ Yes
    - ☐ No
    - ☐ Unsure

33. What is your current pharmacist position/title at your ***primary place*** of employment?
    - ☐ Relief/PRN
    - ☐ Owner

☐ Staff ☐ Other (please specify): _____
☐ Manager/Pharmacist-in-charge

34. Are you employed full-time or part-time at your primary work site?
☐ Full-time (greater than or equal to 30 hours per week)
☐ Part-time (less than 30 hours per week)

35. How many years have you been practicing community pharmacy? _____years

36. Which of the following best describes your primary practice location?
☐ Rural ☐ Suburban ☐ Urban

Please provide any other comments that you may have in the box below.

If you would like to receive an aggregate summary of the results, please email Marc Fleming at mfleming@mail.utexas.edu.

Please fold the questionnaire and place it in the enclosed envelope. Seal the envelope and drop it in any mailbox. No postage is necessary.

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX G: SURVEY COVER LETTERS

Survey Cover Letter

February 14, 2012

Name
Address
City, St, Zip

Dear Name,

Prescription drug abuse and medication overdoses are problematic in some Texas communities. Pharmacists will soon (Summer 2012) be provided with a tool, the Texas **Prescription Drug Monitoring Program (PDMP)**, designed to improve patient care by giving comprehensive information to pharmacists and other health care providers on patients' controlled medication use. This tool can also be used to prevent doctor shopping and abuse, as well as ensure that patients with legitimate needs (i.e., chronic pain) are appropriately treated. The **Texas Department of Public Safety (DPS)**, which oversees data collection of controlled prescription medication dispensed from Texas community pharmacies, **is in the process of providing pharmacists and prescribers access to patients' controlled prescription medication profiles via a secure online password protected website**. The Texas PDMP will allow pharmacists the opportunity to determine, via an online website, when and where patients are filling their controlled prescription medications.

Enclosed is a survey, which has been constructed to **help us understand your intentions to utilize the Texas PDMP** via online secure website when making decisions related to dispensing controlled prescription drugs (e.g., opioids) when it becomes fully operational. Because you are one of 1,000 pharmacists randomly selected for this study, we hope that 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 that it is important that you make yourself heard on an issue that may likely affect your practice.

The survey will take approximately **15 minutes** to complete. All your responses will be **anonymous** (we will not ask for any information that can identify you) and the study records will be stored securely. Reponses will only be reported in aggregate form and results can in no way be linked to you. Completing the mail survey will serve as your consent to participate in the study. After completing the survey, please fold and place it in the enclosed envelope and mail it back to us within two weeks after receipt. No postage is necessary.

This research is being conducted in partial fulfillment of the requirements for a dissertation. Your cooperation is truly appreciated. If you have any questions, please do not hesitate to contact us by phone at (512) 471-5605 or (512) 471-5612 or e-mail mfleming@mail.utexas.edu or jbarner@mail.utexas.edu. If you have questions about your rights or are dissatisfied at any time with any part of this study, you can contact, anonymously if you wish, the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu. Thank you in advance for your time and cooperation in participating in this important study.

Sincerely,

Marc L. Fleming, R.Ph., M.S.
Ph.D. Candidate

Jamie C. Barner, R.Ph., Ph.D.
Professor and Dissertation Advisor

Revised Follow-up Cover Letter

March 6, 2012

Name
Address
City, State, Zip

Dear Recipients Name,

About three weeks ago, you were mailed a questionnaire regarding your intention to utilize the Texas prescription drug monitoring program (PDMP) database. If you have already completed the questionnaire, please accept our sincere thanks and appreciation. If you have not had a chance to complete the questionnaire, we hope that you will take the time to provide your input on such an important topic.

This research is being conducted as partial fulfillment of the requirements for a dissertation. More, importantly, it is an opportunity to ***express your beliefs regarding utilizing the PDMP***. Many patients suffering from chronic pain are treated with controlled medications. Unfortunately, pharmacists are sometimes faced with trying to determine the appropriateness or legitimacy of controlled prescriptions. Your opinions are important to help us understand how the PDMP database can be used to stem the tide of abuse and diversion, while ensuring appropriate access to controlled medications. Important findings from this research will be shared with the Texas Department of Public Safety (DPS).

Enclosed is a questionnaire, which has been designed to help us understand your intention to utilize the Texas PDMP via online secure website **(anticipated summer 2012)** when dispensing controlled prescription drugs (e.g., opioids). Because you are one of 1,000 pharmacists randomly selected for this study, we hope that 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 that it is important that you make yourself heard on an issue that may likely affect your practice.
The survey will take approximately **15 minutes** to complete. All your responses will be **anonymous** (we will not ask for any information that can identify you) and the study records will be stored securely. Responses will only be reported in aggregate form and results can in no way be linked to you. Completing the mail questionnaire will serve as your consent to participate in the study. After completing the questionnaire, please fold it and return it in the business reply envelope provided and mail it back to us within two weeks of receipt, but no later than **March 26, 2012**. No postage is necessary.

Your cooperation is truly appreciated. If you have any questions, please do not hesitate to contact us by phone at (512) 471-5605 or (512) 471-5612 or e-mail mfleming@mail.utexas.edu or jbarner@mail.utexas.edu. If you have questions about your rights or are dissatisfied at any time with any part of this study, you can contact, anonymously if you wish, the Institutional Review Board by phone at (512) 471-8871 or email at orsc@uts.cc.utexas.edu. Thank you in advance for your time and cooperation in participating in this important study.

Sincerely,

Marc L. Fleming, R.Ph., M.S.
Ph.D. Candidate

Jamie C. Barner, R.Ph., Ph.D.
Professor and Dissertation Advisor

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Vita

Marc Fleming was born in Houston, Texas to his loving parents. He completed a Bachelor of Science in Pharmacy, from Texas Southern University in May of 1996. After a year of working in Houston, for Walgreens, he moved to Richmond, Virginia, where he completed a Master of Public Health in May, 2000, from the Medical College of Virginia/Virginia Commonwealth University. He was a selected to address the attendees of his commencement, on the "Future of Public Health." He later returned to Houston, where he worked for Walgreens as a pharmacist and then at Texas Children's Hospital in Houston, Texas. In August 2005, he began his studies as a Graduate Student at the University of Texas. In May, 2009 he obtained a Master of Science in Pharmacy from the University of Texas at Austin. He has been a Teaching Assistant in many courses since joining the Health Outcomes and Pharmacy Practice Division (formerly Pharmacy Administration). He also worked as a pharmacist for Target in South Austin and at Northwest Hills Pharmacy. More importantly, Marc has been a mentor to four Pharm.D. students, and has been a wonderful colleague to his fellow graduate students.

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