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Pharmacists' and Pharmacy Students' Attitudes and Practices related to Providing Syringes to People who Inject Drugs in Tajikistan

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Pharmacists' and Pharmacy Students' Attitudes and Practices related to Providing Syringes to People who Inject Drugs in Tajikistan

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Abstract

Pharmacists' and Pharmacy Students' Attitudes and Practices related to Providing Syringes to People who Inject Drugs in Tajikistan

By Umedjon Ibragimov

Introduction. In Tajikistan, people who inject drugs (PWID) are disproportionately affected by the HIV and HCV epidemics, and may have limited access to sterile syringes in pharmacies. This dissertation pursues the following Specific Aims: 1) to explore the meanings and processes of stigmatization of and discrimination against PWID; 2) to assess pharmacists' practices, attitudes and associated factors related to the provision of sterile needles and syringes to PWID in Tajikistan; 3) to assess pharmacy students' attitudes and associated factors related to provision of sterile needles and syringes to PWID.

Methods. For Aim 1 we collected qualitative data via one-one-one semi-structured interviews with 28 pharmacists and students in Dushanbe and Kulob cities and analyzed data using thematic analysis methods. Aim 2 and Aim 3 comprised the cross-sectional quantitative components of the study. For Aim 2 we conducted syringe purchase attempts that were linked to survey among the random sample of 232 pharmacists in Dushanbe and Kulob. For Aim 3 we collected data via survey of 240 students of Pharmacy Department of Tajik State Medical University in Dushanbe. We applied structural equation modeling to data collected within Aim 2 and Aim 3 to test theory-driven models explaining pharmacists' syringe sale practices and students' willingness to sell syringes to PWID.

Results. Aim 1. Qualitative analysis results showed that stigma is one of the main drivers of pharmacists' refusal to provide syringes to PWID. Perceiving PWID as sinners, and individuals who destroy their own lives, families and society, pharmacists see provision of syringes as abetting moral transgression and crime. Policy and policing factors also affect pharmacists' willingness to provide syringes.

Aim 2. We found that syringes can be purchased without prescription in the majority (87.9%, n=204) of sampled pharmacies. Agreeing to sell syringes was associated with the reported intent to provide syringes without prescription ($\beta=0.36$, $p<0.001$), lower stigma against PWID ($\beta=-0.43$, $p=0.01$), and stronger social conservatism ($\beta=0.35$, $p=0.02$). Pharmacists' stigmatization of PWID was directly associated with social conservatism ($\beta=0.47$, $p<0.001$) and inversely with university-level education ($\beta=-0.28$, $p<0.001$).

Aim 3. Students' willingness to provide syringes positively correlated with favorable attitudes towards provision of syringes to PWID ($\beta=0.47$, $p<0.001$), and negatively with stigma against PWID ($\beta=-0.19$, $p=0.02$) and social conservatism ($\beta=-0.25$, $p=0.002$). Attitudes towards provision of syringes were negatively associated with stigma against PWID ($\beta=-0.21$, $p=0.01$). Stigma also positively correlated with social conservatism ($\beta=0.35$, $p<0.001$).

Conclusion: Our study demonstrated availability of over-the-counter syringes in urban pharmacies of Tajikistan and emphasized the role of stigma in shaping pharmacists' syringe sale practices. Future research should focus on developing anti-stigma educational interventions targeting pharmacists and pharmacy students to ensure uninterrupted access of PWID to clean syringes.

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Table of Contents

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List of Figures

List of Tables

Chapter 1: Introductory Literature Review

Introduction

Injecting drug use (IDU) remains a major risk factor for bloodborne infections in Tajikistan, the poorest country in Central Asia, with about quarter of new HIV cases attributed to IDU in 2014. According to recent data, HIV prevalence among people who inject drugs (PWID, estimated population size=23,500) in select cities of Tajikistan averaged 26.5% and hepatitis C prevalence in the capital city reached 36.8%, while among the general population HIV prevalence was less than 1% (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014; Zule, Otiashvili, Latypov, Bangel, & Wechsberg, 2017). Sharing injecting equipment is one of the main modes of HIV and HCV transmission – about 12% of surveyed PWID reported use of non-sterile needles for the last injection in 2014. If unaddressed, this situation may lead to an explosive outbreak of HIV among PWID and further generalization of the epidemic, as happened in other developing countries (Mills, White, Colijn, Vickerman, & Heimer, 2013; Morris, Podhisita, Wawer, & Handcock, 1996; Rhodes et al., 2002).

Access to Syringes as HIV prevention

Ensuring access to free injection equipment via community-based outreach needle and syringe programs (NSPs) is part of a comprehensive HIV prevention package (Abdul-Quader et al., 2013; Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012; Palmateer et al., 2010). In Tajikistan NSPs have been legally operating since 2000; however, from 26% to 47% of PWID surveyed in Tajikistani cities reported limited or no access to sterile syringes (Ministry of Health of Tajikistan, 2014). Such discrepancy between the relatively low prevalence of reported risky injecting practices and limited access to

syringes can be explained by social desirability bias, as reported in the past literature (Adebajo et al., 2014; Des Jarlais et al., 1999; Perlis, Des Jarlais, Friedman, Arasteh, & Turner, 2004; Simoes, Bastos, Moreira, Lynch, & Metzger, 2006). Tajikistani PWID reported that pharmacies are important complementary source of sterile injecting equipment in the situations when NSP services are not available or accessible (Otiashvili, Latypov, Kirtadze, Ibragimov, & Zule, 2016). While NSPs operate legally within the National AIDS Program, existing policies do not explicitly allow selling of syringes without prescription at pharmacies. As the result, the decision to sell syringes is left to pharmacists' discretion. At the same time, available qualitative findings indicate that pharmacy workers may refuse to sell syringes to PWID, mistreat them or report them to the police (Ibragimov, Latypov, Jamolov, & Khasanova, 2011; Otiashvili et al., 2016). Absence of pharmacy-based NSPs providing free syringes in a client-friendly setting is another barrier to utilization of prevention services by PWID.

Potential Determinants of PWID Access to Syringes in Pharmacies

Stigmatization of PWID

IDU is one of the most stigmatized behaviors throughout the world (Lloyd, 2010). Studies from various parts of the world showed that pharmacists may stereotype PWID as irresponsible and irrational individuals leading unstable lives; perceive them as problematic customers prone to crime, aggression, inflicting harm to others and thus disrupting pharmacy operations (Hall & Matheson, 2008; Lewis, Koester, & Bush, 2002; Simmonds & Coomber, 2009, p. 124; Taussig, Junge, Burris, Jones, & Sterk, 2002, p. s40; Vorobjov, Uusküla, Abel-Ollo, Talu, & Des Jarlais, 2009). All these negative perceptions of PWID are indeed baseless stereotypes because the research shows that the vast majority of PWID customers behave normally and do not pose any

threat to pharmacists or other customers (Watson & Hughes, 2012). Studies in the developed countries found that stigmatizing attitudes towards PWID are associated with pharmacists' reluctance to provide sterile needles and syringes (Mashburn, 2003; Pollini et al., 2014; Zaller, Jeronimo, Bratberg, Case, & Rich, 2010).

Beliefs in the outcomes of syringe provision

Pharmacists' attitudes towards provision of syringes to PWID may also depend on beliefs about public health and community-related outcomes of providing sterile syringes to PWID. Thus, beliefs that providing syringes may reduce HIV and HCV infections were associated with positive attitudes towards this service, while perceived negative consequences (e.g., encouraging drug use; community littering with used needles) have been found to be correlated with reluctance to provide syringes (Amesty, Blaney, Crawford, Rivera, & Fuller, 2012; Pollini et al., 2014; Rich et al., 2002).

Background influence factors

According to the literature, factors that may influence pharmacists' and other service providers' stigmatization of PWID incluse knowledge of HIV and harm reduction-related issues, personal exposure to PWID, beliefs in controllability of drug use, religiosity and social conservatism (Altemeyer & Hunsberger, 1992; Brener & Von Hippel, 2008; Brener, von Hippel, & Kippax, 2007; Kamarulzaman & Saifuddeen, 2010; Laythe, Finkel, & Kirkpatrick, 2001; Narayanan, Vicknasingam, & Robson, 2011; Palamar, Kiang, & Halkitis, 2011; Taussig et al., 2002).

External factors

Pharmacists' support for provision of sterile syringes can also depend on environmental factors such as state or corporate policies regulating OTC sales of syringes (Hammett et al., 2014; Scott & Mackridge, 2009). In some cases, it was not the

laws themselves, but pharmacists' limited awareness of current laws regulating syringe sales that prevented them from selling syringes OTC (Watson & Hughes, 2012). Pharmacists' reluctance to sell syringes can also be attributed to the negative attitude of police towards PWID (Pollini et al., 2014). These findings stress the need to explore the linkage between pharmacists' perception of external barriers and their willingness to provide services to PWID.

Gaps in Scientific Knowledge of Pharmacists' Syringe Sale Behaviors

Lack of data on pharmacists' attitudes and practices in Tajikistan

No prior studies have investigated practices and attitudes of service providers related to provision of syringes to PWID in Tajikistan or in other countries of Central Asia. Furthermore, no studies of service providers practices and attitudes towards provision of HIV prevention services to stigmatized populations in Central Asia have been reported either. A few studies conducted among pharmacists in other post-Soviet countries (Fedorova et al., 2013; Vorobjov et al., 2009) may have limited applicability to the sociocultural context of this region that is gradually parting from the Soviet legacy and experiencing a revival of Islamic religious beliefs that prohibit drug use. Similarly, no studies have been conducted among pharmacy students in this region.

Linkage between pharmacists' attitudes and actual syringe sale practices

Previous studies that assessed factors influencing provision of syringes to PWID in other countries based their findings on self-reports by pharmacists or on the availability of syringe provision service in pharmacies. Several studies have assessed actual syringe sale practices in the US, Mexico and Russia via syringe purchase audits

(Compton et al., 2004; Fedorova et al., 2013; Pollini et al., 2010); however, they did not collect data on pharmacists' attitudes, beliefs and other background factors.

Lack of theory-driven models explaining pharmacists' practices

Finally, to our best knowledge, no comprehensive theory-driven models predicting how stigma and relevant background factors influence pharmacists' attitudes and practices related to selling syringes to PWID have been published. Lack of such models impedes the development of culturally acceptable advocacy and awareness raising activities promoting the accessibility of syringes for PWID.

Significance of the Research

This dissertation addresses gaps in the scientific literature on pharmacists' attitudes and practices related to provision of syringes to PWID. This is the first study to combine qualitative and quantitative methods to develop and test theory-driven comprehensive models explaining the linkage between background and contextual factors (i.e. knowledge, social conservatism), stigma, pharmacists' and pharmacy students' attitudes towards PWID and syringe sale practices. This is the first study to explore service providers' attitudes and practices related to provision of HIV prevention services to PWID in Tajikistan and in Central Asia in general, a region with disproportionately high prevalence of HIV among this population. This research also aims to test the applicability of an established behavioral science theory (see Theoretical Framework section) to explaining attitudes and practices related to syringe sales. The study results will help to inform the development of interventions promoting accessibility of syringes for PWID in Tajikistan as part of comprehensive HIV response.

To that end, this **exploratory study will pursue the following specific aims**:

Aim 1: Explore the meanings and processes of stigmatization and discrimination against PWID.

Aim 2: Assess pharmacists' (N = 220) practices, attitudes and associated factors related to the provision of sterile needles and syringes to PWID in two cities of Tajikistan (Dushanbe and Kulob).

Aim 3: Assess pharmacy students' (N = 220) attitudes and associated factors related to the provision of sterile needles and syringes to PWID in Dushanbe.

Theoretical framework

Since the literature suggests that attitudes and beliefs play an important role in forming pharmacists' decision to provide services to PWID, we assume that the willingness of the former to provide syringes can be explained by applying the Integrated Behavioral Model (IBM). Developed as an extension of the Theory of Planned Behavior (TPB), IBM integrates attitudes and beliefs as key constructs explaining intent to perform the behavior – a major determinant of actual behavior. IBM and TPB also account for the influence of perceived external factors (i.e. social norms, environmental barriers and facilitators) on behavior by encompassing perceived norms and self-efficacy constructs. IBM and TPB have been successfully applied to a wide range of behaviors in various settings (Montano & Kasprzyk, 2008). In particular, TPB has been used to investigate attitudes of Texas pharmacists to OTC sales of syringes to known or suspected PWID (Mashburn, 2003).

The proposed theoretical framework (Figure 1.1 for pharmacists and 1.2 for students) is based on the relationships between the core constructs as predicted by IBM and TPB, and their association with background influences thought to be relevant based on the literature review (Montano & Kasprzyk, 2008). In particular, actually providing

syringes to PWIDs is a function of the *intent* to perform this behavior, which, in turn, depends on *attitudes*, *perceived norms*, and *self-efficacy* related to this behavior. Specification of these constructs as latent variables was proposed by Hankins, French, and Horne (2000). *Stigma against PWID* and its predecessors are key background constructs in the model influencing pharmacists' attitudes regarding provision of syringes to PWID (Simmonds & Coomber, 2009). The PWID stigma construct is hypothesized to be influenced by *social conservatism, perceived drug use controllability*, *HIV and harm reduction knowledge* and *personal exposure to PWID* as shown in the literature (Altemeyer & Hunsberger, 1992; Brener & Von Hippel, 2008; Brener et al., 2007; Ding et al., 2005; Kamarulzaman & Saifuddeen, 2010; Laythe et al., 2001; Narayanan et al., 2011; Palamar et al., 2011; Scott & Mackridge, 2009; Taussig et al., 2002).

Figure 1.1. Hypothesized model of Tajikistani pharmacists' practices related to providing syringes to PWID

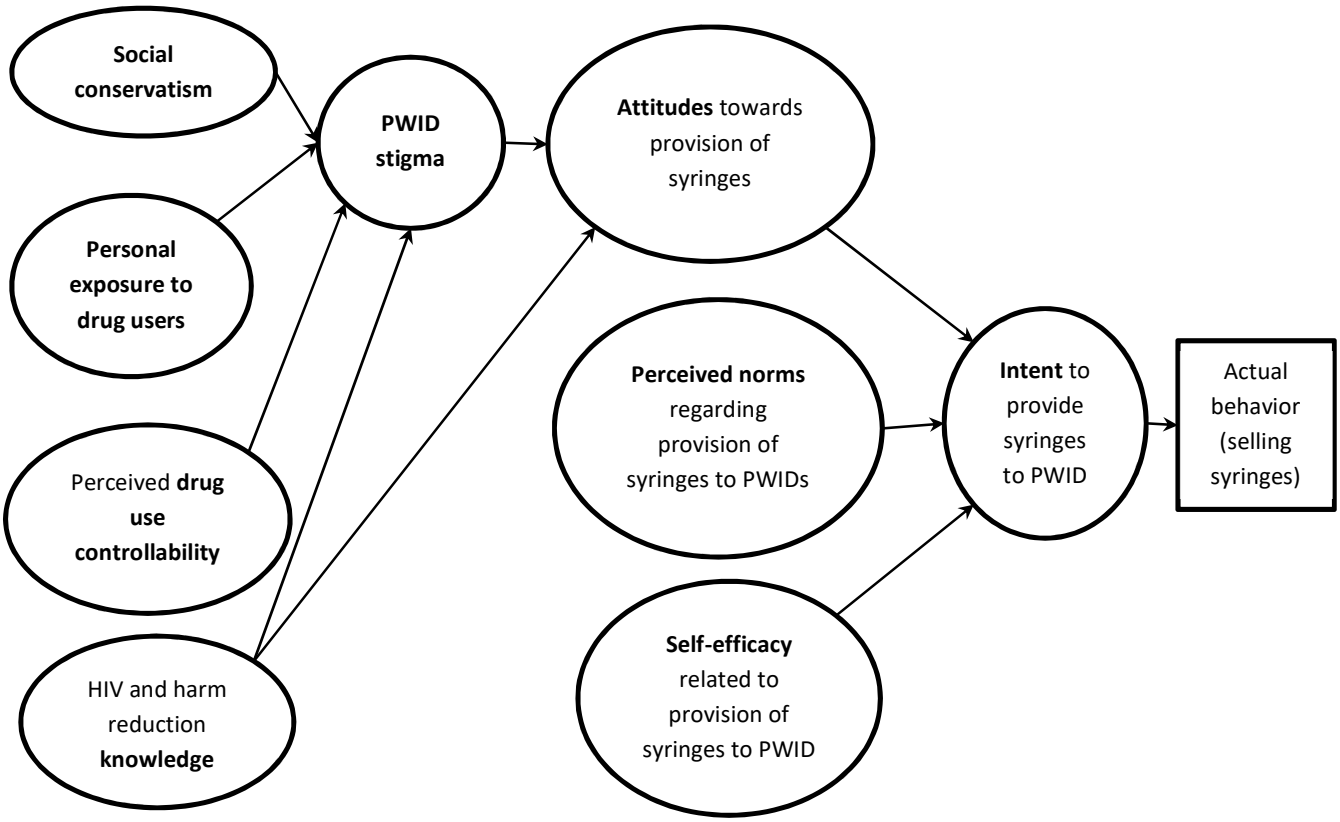
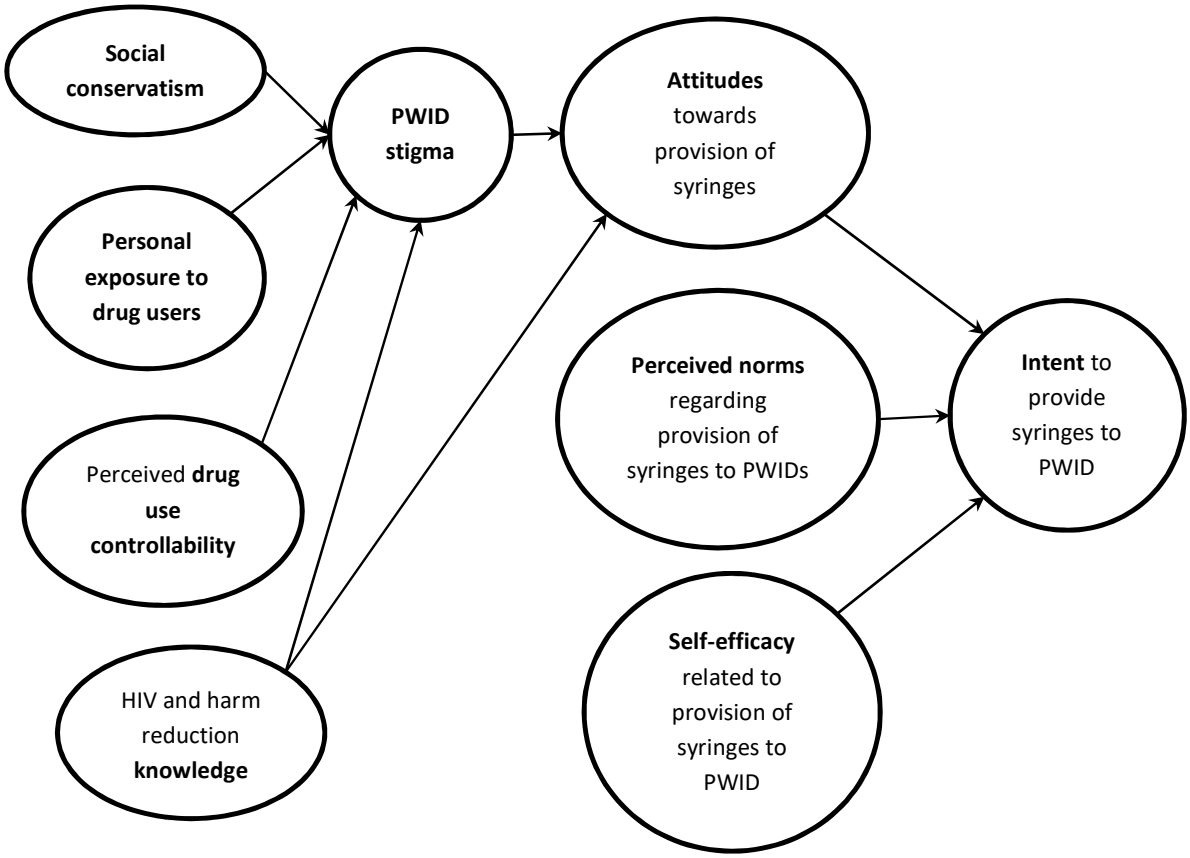


Figure 1.2. Hypothesized model of Tajikistani pharmacy students' intent to provide syringes to PWID



A detailed description of the dissertation research approaches and findings is presented in the following four chapters. Chapter 2 describes qualitative examination of cultural and experiential processes and meanings of stigmatization of PWID by pharmacists and pharmacy students (Aim 1). Chapter 3 presents the results of testing the model of pharmacists' actual syringe sale practices and associated attitudinal and background contextual factors (Aim 2). Chapter 4 tests the model explaining pharmacy students' willingness to provide syringes (Aim 3). Chapter 5 concludes the dissertation by describing an integrative summary of the findings, strengths and limitations of the study, and implications for public health practice and research.

References

Abdul-Quader, A. S., Feelemyer, J., Modi, S., Stein, E. S., Briceno, A., Semaan, S., . . . Des Jarlais, D. C. (2013). Effectiveness of structural-level needle/syringe programs to reduce HCV and HIV infection among people who inject drugs: a systematic review. *AIDS and Behavior, 17*(9), 2878-2892.

Adebajo, S., Obianwu, O., Eluwa, G., Vu, L., Oginni, A., Tun, W., . . . Idogho, O. (2014). Comparison of Audio Computer Assisted Self-Interview and Face-To-Face Interview Methods in Eliciting HIV-Related Risks among Men Who Have Sex with Men and Men Who Inject Drugs in Nigeria. *PloS one, 9*(1), e81981.

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion, 2*(2), 113-133.

Amesty, S., Blaney, S., Crawford, N. D., Rivera, A. V., & Fuller, C. (2012). Pharmacy staff characteristics associated with support for pharmacy-based HIV-testing in pharmacies participating in the New York State Expanded Access Syringe Exchange Program. *Journal of the American Pharmacists Association: JAPhA, 52*(4), 472.

Brener, L., & Von Hippel, W. (2008). Measuring attitudes toward injecting drug users and people with hepatitis C. *Substance use & misuse, 43*(3-4), 295-302.

Brener, L., von Hippel, W., & Kippax, S. (2007). Prejudice among health care workers toward injecting drug users with hepatitis C: does greater contact lead to less prejudice? *International Journal of Drug Policy, 18*(5), 381-387.

Compton, W. M., Horton, J. C., Cottler, L. B., Booth, R., Leukefeld, C. G., Singer, M., . . . Staton, M. (2004). A multistate trial of pharmacy syringe purchase. *Journal of Urban Health, 81*(4), 661-670.

Des Jarlais, D. C., Paone, D., Milliken, J., Turner, C. F., Miller, H., Gribble, J., . . . Friedman, S. R. (1999). Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: a quasi-randomised trial. *The Lancet, 353*(9165), 1657-1661.

Ding, L., Landon, B. E., Wilson, I. B., Wong, M. D., Shapiro, M. F., & Cleary, P. D. (2005). Predictors and consequences of negative physician attitudes toward HIV-infected injection drug users. *Archives of Internal Medicine, 165*(6), 618-623.

Dutta, A., Wirtz, A. L., Baral, S., Beyrer, C., & Cleghorn, F. R. (2012). Key harm reduction interventions and their impact on the reduction of risky behavior and HIV incidence among people who inject drugs in low-income and middle-income countries. *Current Opinion in HIV and AIDS, 7*(4), 362-368.

Fedorova, E. V., Skochilov, R. V., Heimer, R., Case, P., Beletsky, L., Grau, L. E., . . . Shaboltas, A. V. (2013). Access to syringes for HIV prevention for injection drug users in St. Petersburg, Russia: syringe purchase audit study. *BMC Public Health, 13*(1), 183.

Government of Tajikistan. (2015). *UNGASS Country Progress Report, 2015*. Retrieved from http://www.unaids.org/sites/default/files/country/documents/TJK_narrative_report_2015.pdf

Hall, S., & Matheson, C. (2008). Barriers to the provision of needle-exchange services: a qualitative study in community pharmacies. *International journal of pharmacy practice, 16*(1), 11-16.

Hammett, T. M., Phan, S., Gaggin, J., Case, P., Zaller, N., Lutnick, A., . . . Small, W. (2014). Pharmacies as providers of expanded health services for people who inject drugs: a review of laws, policies, and barriers in six countries. *BMC health services research, 14*(1), 261.

Hankins, M., French, D., & Horne, R. (2000). Statistical guidelines for studies of the theory of reasoned action and the theory of planned behaviour. *Psychology and Health, 15*(2), 151-161.

Ibragimov, U., Latypov, A., Jamolov, P., & Khasanova, E. (2011). *Needs assessment among opiate users in Dushanbe-city in 2010: the qualitative assessment.* Retrieved from Dushanbe, Tajikistan:

Kamarulzaman, A., & Saifuddeen, S. (2010). Islam and harm reduction. *International Journal of Drug Policy, 21*(2), 115-118.

Laythe, B., Finkel, D., & Kirkpatrick, L. A. (2001). Predicting prejudice from religious fundamentalism and right-wing authoritarianism: a multiple-regression approach. *Journal for the Scientific Study of Religion, 40*(1), 1-10.

Lewis, B. A., Koester, S. K., & Bush, T. W. (2002). Pharmacists' attitudes and concerns regarding syringe sales to injection drug users in Denver, Colorado. *Journal of the American Pharmacists Association, 42*(6s2), S46-S51.

Lloyd, C. (2010). Sinning and sinned against: The stigmatisation of problem drug users. *York: University of York*.

Mashburn, J. H. (2003). *Using the theory of planned behavior to predict Texas community pharmacists' willingness to provide sterile syringes to known or suspected intravenous drug users (Doctoral dissertation)*.

Mills, H. L., White, E., Colijn, C., Vickerman, P., & Heimer, R. (2013). HIV transmission from drug injectors to partners who do not inject, and beyond: Modelling the potential for a generalized heterosexual epidemic in St. Petersburg, Russia(). *Drug and alcohol dependence, 133*(1), 242-247. doi:10.1016/j.drugalcdep.2013.04.028

Ministry of Health of Tajikistan. (2014). *Results of sentinel surveillance among injecting drug users in Tajikistan, 2014*. Retrieved from

Montano, D. E., & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health behavior and health education: Theory, research, and practice, 4*, 67-95.

Morris, M., Podhisita, C., Wawer, M. J., & Handcock, M. S. (1996). Bridge populations in the spread of HIV/AIDS in Thailand. *AIDS (London, England), 10*(11), 1265-1271.

Narayanan, S., Vicknasingam, B., & Robson, N. M. H. (2011). The transition to harm reduction: Understanding the role of non-governmental organisations in Malaysia. *International Journal of Drug Policy, 22*(4), 311-317.

Otiashvili, D., Latypov, A., Kirtadze, I., Ibragimov, U., & Zule, W. (2016). Drug preparation, injection, and sharing practices in Tajikistan: a qualitative study in Kulob and Khorog. *Substance abuse treatment, prevention, and policy, 11*(1), 1-8. doi:10.1186/s13011-016-0065-2

Palamar, J. J., Kiang, M. V., & Halkitis, P. N. (2011). Development and psychometric evaluation of scales that assess stigma associated with illicit drug users. *Substance use & misuse, 46*(12), 1457-1467.

Palmateer, N., Kimber, J., Hickman, M., Hutchinson, S., Rhodes, T., & Goldberg, D. (2010). Evidence for the effectiveness of sterile injecting equipment provision in preventing hepatitis C and human immunodeficiency virus transmission among injecting drug users: a review of reviews. *Addiction, 105*(5), 844-859.

Perlis, T. E., Des Jarlais, D. C., Friedman, S. R., Arasteh, K., & Turner, C. F. (2004). Audio-computerized self-interviewing versus face-to-face interviewing for research data collection at drug abuse treatment programs. *Addiction, 99*(7), 885-896.

Pollini, R. A., Gallardo, M., Ruiz, S., Case, P., Zaller, N., & Lozada, R. (2014). Over-the-Counter But Out of Reach: A Pharmacy-Based Survey of OTC Syringe Sales in Tijuana, Mexico. *Journal of Health Care for the Poor and Underserved, 25*(2), 637-651.

Pollini, R. A., Lozada, R., Gallardo, M., Rosen, P., Vera, A., Macias, A., . . . Strathdee, S. A. (2010). Barriers to pharmacy-based syringe purchase among injection drug users in Tijuana, Mexico: a mixed methods study. *AIDS and Behavior, 14*(3), 679-687.

Rhodes, T., Lowndes, C., Judd, A., Mikhailova, L. A., Sarang, A., Rylkov, A., . . . Alpatova, T. (2002). Explosive spread and high prevalence of HIV infection among injecting drug users in Togliatti City, Russia. *Aids, 16*(13), F25-F31.

Rich, J. D., Martin, E. G., Macalino, G. E., Paul, R. V., McNamara, S., & Taylor, L. E. (2002). Pharmacist support for selling syringes without a prescription to injection drug users in Rhode Island. *Journal of the American Pharmacists Association, 42*(6s2), S58-S61.

Scott, J., & Mackridge, A. J. (2009). Pharmacy support staff involvement in, and attitudes towards, pharmacy-based services for drug misusers. *International journal of pharmacy practice, 17*(6), 325-332.

Simmonds, L., & Coomber, R. (2009). Injecting drug users: A stigmatised and stigmatising population. *International Journal of Drug Policy, 20*(2), 121-130.

Simoes, A. A., Bastos, F. I., Moreira, R. I., Lynch, K. G., & Metzger, D. S. (2006). A randomized trial of audio computer and in-person interview to assess HIV risk among drug and alcohol users in Rio De Janeiro, Brazil. *Journal of substance abuse treatment, 30*(3), 237-243.

Taussig, J., Junge, B., Burris, S., Jones, T. S., & Sterk, C. E. (2002). Individual and structural influences shaping pharmacists' decisions to sell syringes to injection drug users in Atlanta, Georgia. *Journal of the American Pharmacists Association, 42*(6s2), S40-S45.

Vorobjov, S., Uusküla, A., Abel-Ollo, K., Talu, A., & Des Jarlais, D. (2009). Should pharmacists have a role in harm reduction services for IDUs? A qualitative study in Tallinn, Estonia. *Journal of Urban Health, 86*(6), 918-928.

Watson, T., & Hughes, C. (2012). Pharmacists and harm reduction: a review of current practices and attitudes. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada, 145*(3), 124-127. e122.

Zaller, N., Jeronimo, A., Bratberg, J., Case, P., & Rich, J. D. (2010). Pharmacist and pharmacy staff experiences with non-prescription (NP) sale of syringes and attitudes toward providing HIV prevention services for injection drug users (IDUs) in Providence, RI. *Journal of Urban Health, 87*(6), 942-953.

Zule, W. A., Otiashvili, D., Latypov, A., Bangel, S., & Wechsberg, W. (2017). Gender disparities in HIV prevalence and risk behaviors among people who inject drugs in Tajikistan. *Drug & Alcohol Dependence, 171*, e225. doi:10.1016/j.drugalcdep.2016.08.614

Chapter 2: Pharmacists' stigmatization of people who inject drugs (PWID) in Tajikistan: sociocultural context and implications for promoting prevention services

ABSTRACT

Introduction. Pharmacies are an important source of sterile syringes for people who inject drugs (PWID) in Tajikistan who are under high risk of HIV and HCV. Accessibility of sterile syringes at pharmacies without prescription may depend on pharmacists' attitudes towards PWID. This qualitative inquiry examines meaning and processes of stigmatization of PWID by pharmacists and pharmacy students.

Methods. We conducted semi-structured interviews with 19 pharmacists and 9 students (N=28) in the cities of Dushanbe and Kulob in Tajikistan. The interview topics included personal attitudes towards drug use and PWID, encounters with PWID, awareness and beliefs related to drug dependence and HIV, and attitudes and practices related to providing syringes to PWID. Interview transcripts were analyzed using thematic analysis methods.

Findings. The main themes to emerge included the significance of religion in defining attitudes towards drug use, labelling of PWID, negative stereotypes (PWID are prone to crime, violence, and irrational aggression; inflict harm to families and society; are unable to control drug use), emotions triggered by PWID (fear, sympathy) and discrimination against PWID (rejection, isolation, ostracism, limiting resources to PWID). The religious ban on drug use and pharmacists' moral and legal responsibility for the consequences of drug use were frequently mentioned as reasons for rejecting syringe sales. Still, many respondents acknowledged the need for distributing syringes to PWID to prevent HIV.

Conclusion. Stigma against PWID in Tajikistan plays important role in shaping pharmacists' attitudes towards provision of services to this population. Local sociocultural context, in particular religious beliefs and social conservatism, may facilitate stigmatizing beliefs.

Introduction

Tajikistan, with a population of 8 million, is one of the poorest countries in post-Soviet Central Asia. Similar to other countries in the region, Tajikistan is experiencing twin epidemics of HIV and hepatitis C virus (HCV) among people who inject drugs (PWID). According to the most recent estimates, HIV and HCV prevalence among PWID (estimated population size=23,500) in Tajikistan reached 12.9% and 22.7% respectively in 2014 (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014). While about 88% of surveyed PWID reported using sterile injecting equipment during the last injection in 2014, almost a quarter of new HIV cases in the country were still attributed to sharing injecting equipment (Government of Tajikistan, 2015). If unaddressed, this situation may increase the burden of blood-borne infections among PWID and cause the spread of the HIV epidemic to the general population, as demonstrated in other developing countries (Mills, White, Colijn, Vickerman, & Heimer, 2013; Morris, Podhisita, Wawer, & Handcock, 1996; Rhodes et al., 2002).

Providing access to sterile needles and syringes has been shown to reduce the prevalence of risky injecting practices, and thus contributes to curbing HIV and HCV epidemics among PWID (Abdul-Quader et al., 2013; Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012; Palmateer et al., 2010). Ensuring access to free injection equipment via community-based outreach needle and syringe programs (NSPs) is a part of Tajikistan's National AIDS Program. There were 51 NSP service outlets reaching 52% of the estimated PWID population in 2014; these NSPs provided an average of 214 sterile syringes per PWID per year (Government of Tajikistan, 2015). Nevertheless, taking into account the high frequency of injections and the need to replace broken or clogged needles and syringes, this number may not be sufficient to cover PWID needs (Otiashvili, Latypov, Kirtadze, Ibragimov, & Zule, 2016). In addition, a 2014 survey revealed

that in half of the survey sites 26% to 47% PWID had limited or no access to sterile syringes (Ministry of Health of Tajikistan, 2014). Discrepancies between low prevalence of unsafe behaviors and limited access to syringes may be explained by PWID underreporting syringe sharing due to social desirability bias, as shown for similar risky practices in other countries (Adebajo et al., 2014; Des Jarlais et al., 1999; Perlis, Des Jarlais, Friedman, Arasteh, & Turner, 2004; Simoes, Bastos, Moreira, Lynch, & Metzger, 2006).

Pharmacies are an important source of sterile needles and syringes for PWID throughout the world. Available evidence from other countries suggests that pharmacy-based NSP (PBNSP) can be effective in reducing HIV transmission among PWID (MacArthur et al., 2014; Tilson et al., 2007; Wodak & Cooney, 2004). In Tajikistan, existing regulations do not directly prohibit sales of syringes without a prescription, and numerous pharmacies can be easily accessed in all cities and towns. Therefore, PWID may buy syringes in pharmacies if NSP services are unavailable in the area or if injection equipment is needed when NSPs are closed. Nevertheless, PWID reported cases of pharmacists refusing to sell syringes to PWID, mistreating them, or reporting them to the police (Otiashvili et al., 2016). Difficulty in accessing syringes in pharmacies is further compounded by vague or unfavorable policy frameworks. In particular, since governmental policies do not explicitly allow the provision of syringes without a prescription for prevention purposes, legislation prohibiting aiding and abetting drug use may be used to prosecute service providers who offer syringes to PWID (Beardsley & Latypov, 2012; Boymatov, 2015).

Publications from other parts of the world suggest that pharmacists' stigmatization of PWID plays a critical role in limiting access to sterile injection equipment and other services (Coffin, Linas, Factor, & Vlahov, 2000; Eades, Ferguson, & O'Carroll, 2011; Matheson, Bond,

& Mollison, 1999; Rich et al., 2002; Taussig, Junge, Burris, Jones, & Sterk, 2002; Watson & Hughes, 2012). Stigma is a complex phenomenon. In their seminal work "Conceptualizing Stigma" Link and Phelan defined stigma as a process involving "… co-occurrence of [stigma] components – labeling, stereotyping, separation, status loss, and discrimination" and emphasized that "…for stigmatization to occur, power must be exercised" (Link & Phelan, 2001, p.363). According to the authors, the process of stigmatization starts with labeling salient human differences. They highlight that the term "labeling," in contrast to "mark," "condition" or "attribute," indicates that labels are assigned as the product of social processes and are not a valid designation of a stigmatized persons' characteristic. The label "drug addict" implies that addiction is a key characteristic of a person that overshadows his or her other traits. Further, labelled persons are associated with undesired characteristics according to the prevailing cultural norms and beliefs (negative stereotyping). Stigmatization then entails separation of labeled persons from the rest of society by placing them into a different category ("us vs. them") and finally loss of status and discrimination, which is an integral part of stigma. In 2004, Link and colleagues added the emotional reaction of stigmatizing persons (fear, anger, pity, and irritation) and of those of the stigmatized (fear, alienation, shame, and embarrassment) as one more component of stigmatization (Link, Yang, Phelan, & Collins, 2004).

Link and Phelan emphasize that existing power disparities enable and maintain the stigmatization processes. Without power imbalances, stigma would be impossible regardless of labels and negative stereotypes, because status loss and discrimination would not occur (Link & Phelan, 2001). Power imbalance between PWID and service providers can be caused by a wide range of factors. The war on drugs and repressive drug policies are examples of broader structural factors that disempower PWID and lead to their stigmatization by society (see, e.g.

Buchanan & Young, 2000; Latypov, 2009). Structural factors may also cause situation-specific power imbalances enabling discrimination. Thus, policies granting pharmacists decision-making authority regarding sale of syringes may result in refusals to sell syringes to PWID (see, e.g. Taussig et al., 2002).

Stigma does not develop in a vacuum, but closely depends on the sociocultural context of the society; stigma exists as part of social relationships, as indicated by Goffman (1963). Stigma researchers proposed models linking sociocultural factors and health-related stigmatization (Abdullah & Brown, 2011; Pescosolido, Martin, Lang, & Olafsdottir, 2008). However, there is a lack of empirical data validating the applicability of these models to understudied cultures and societies. Furthermore, rapid changes in the sociocultural context in transitioning countries, such as changing norms or exposure to new information, may result in generational differences in stigma perception (see, e.g., Balabanova, Coker, Atun, & Drobniewski, 2006). In this regard, the processes of stigma and discrimination enacted by pharmacists may vary from those practiced by students, warranting exploration of PWID-related stigma among future professionals.

Tajikistan and the rest of post-Soviet Central Asia is a region where research about drug-related stigma generated from other parts of the world may have limited applicability. The legacy of Soviet-era prohibitionist drug policies, the influx of heroin from neighboring Afghanistan, sub-standard health care systems, collectivistic and patriarchal norms and the rising influence of Islam (Harris, 2005; Khashimova, 2010; Latypov, 2009, 2012) – all contribute to the unique sociocultural and structural background of drug-related stigma. Islam may be the most important cultural factor defining stigma against PWID in this predominantly Muslim region, since its teachings prohibit the use of mind-altering substances. Islamic leaders' opposition to harm reduction programs because they perceived them as encouraging drug use has become a

significant barrier to ensuring access to prevention services in some Muslim countries (Narayanan, Vicknasingam, & Robson, 2011). The role of Islam in shaping attitudes towards PWID may be particularly salient in the patriarchal collectivistic societies of Central Asia that have little tolerance for deviations from social norms (see, e.g. Smolak, 2010). Therefore, investigating factors underlying current and future service providers' attitudes towards PWID in Central Asia may be an important step forward in developing effective anti-stigma interventions locally.

To address these research needs, our qualitative study was aimed to explore the meanings and processes of stigmatization and discrimination of PWID by pharmacists and pharmacy students in Tajikistan via the prism of the local sociocultural context.

Methods

Setting

We collected data via individual in-depth interviews with pharmacists and pharmacy students in the cities of Dushanbe and Kulob in Tajikistan in November-December 2014. Dushanbe, the capital city with the population of 776,000 [the largest in the country (Tajikistan Statistics Agency, 2014)], was selected as a study site because it contains the largest PWID population in the country (Ministry of Health of Tajikistan, 2014). Kulob [population: 100,000 (Tajikistan Statistics Agency, 2014)] was chosen because it is the largest city in the Khatlon province that borders Afghanistan (Tajikistan Statistics Agency, 2014). Both cities have a wide range of free HIV-related services targeting PWID including NSP, pilot opioid substitution treatment (OST) programs, and HIV testing and treatment (Government of Tajikistan, 2015).

Participants

Eligibility criteria for participants were: living in Dushanbe or Kulob; being age 18 or above; able to provide informed consent; and either working as a pharmacist in a pharmacy or being a student in a university pharmacy department. We aimed to recruit 30-35 participants. Pharmacists were recruited in pharmacies; purposive sampling was employed to achieve diversity in location of pharmacies within each city, and to achieve diversity in the age and gender of pharmacists. Pharmacy students were recruited via informational fliers distributed at the Pharmacy Department of Tajik State Medical University located in Dushanbe. Eligible candidates provided informed consent and received cash compensation equivalent to US$10. The Emory University IRB and Medical Ethics Committee of the Ministry of Health and Social Protection of Tajikistan approved the study protocol.

Data collection

The first author (UI) conducted interviews in Tajik and Russian using a semi-structured interview guide. The guide covered personal attitudes towards drug use and PWID, encounters with PWID, awareness and beliefs related to drug dependence and HIV, and attitudes and practices related to providing syringes to PWID. The guide's topics were reviewed and revised iteratively between interviews. We stopped conducting interviews when thematic saturation for stigmatization of PWID has been reached. Interviews with pharmacists took place in pharmacies (either in a back office or after the pharmacy had closed), while the students were interviewed in a room in the Pharmacy Department of the Tajik Medical University. All interviews were audio-recorded with participants' consent.

Analysis

Audiotapes of interviews were transcribed verbatim into Tajik and Russian. Transcripts were analyzed using theoretical thematic analysis methods, a method that codes data and groups codes into themes using a predefined theoretical framework (Braun & Clarke, 2006). In particular, we mapped emic codes derived from data into theoretically-defined themes related to the stages of the stigmatization process (stereotyping, emotional reaction, labeling, loss of status, isolation and discrimination) proposed by Link, Phelan and colleagues (Link & Phelan, 2001; Link, Yang, Phelan, & Collins, 2004). In addition, we created a separate category for underlying norms and beliefs related to participants' perception of drug use as stigmatized characteristic.

Two coders fluent in local languages and familiar with the content area coded each transcript using the constant-comparison method, discussing and reconciling coding discrepancies when they arose. Initial emic codes (i.e., codes identified and labeled based on data, not theory) with related meanings were grouped into categories. Finally, more narrowly defined emic categories were mapped into higher-level categories corresponding to the processes within Link and Phelan's stigma concept. We assessed differences in themes and sub-themes between pharmacists and students, as well as across participants' gender, age and city. For purposes of this manuscript the first author translated the quotes presented in the Results section to English.

Results

Sample characteristics

In-depth interviews were conducted with 19 pharmacists and 9 students (N=28, Table 2.1). Ten of the pharmacists and all of the students were from Dushanbe; 9 pharmacists from Kulob. The

youngest participant was 21, the oldest was 52 (median=35). The majority of pharmacists (n=12) and students (n=5) were women.

Religion and other underlying beliefs about drug use

Almost all participants, including those who disagreed with using harsh measures towards PWID, viewed drug use as an unacceptable or undesirable behavior, even when it does not result in harmful consequences. About three quarters of participants referred to Islam's prohibition against drugs while explaining their negative views of drug use. Moreover, a few participants stressed that by using drugs a person commits a sin, and, therefore, deserves punishment:

> *[Drugs] destroy the person, destroy his soul. In Islam, a person's soul should be attached to Allah only. If we use drugs or alcohol, then we would stop thinking about [God]. […] Therefore, a person who uses drugs becomes a sinner. It does not matter why he started using. It matters that he couldn't stop, couldn't overcome himself. If we overcome our [weaknesses], then we become righteous [Muslims] in Allah's eyes. […] We should live by Sharia laws, if we violate them, we become sinners and will be punished [in the afterlife].* - Female student, 22, Dushanbe

At the same time, more than half of the participants viewed drug dependence as a disease and believed that drug dependence should be treated rather than punished; pharmacists were more likely than students to endorse this view:

> *I think it is kind of [a] disease, they have this dependence, addiction to drugs… But they are not criminals from the start, they become criminals [by stealing] to find money for drugs… They are like psychiatric patients, if [mentally ill persons] do something, even kill someone, they are not imprisoned, they are sent to a hospital for treatment… I think [PWID] should be treated in the same way too…* - Female pharmacist, 34, Dushanbe.

Nevertheless, some of the participants who agreed that drug dependence is a disease, stated that it is still a sin and cannot be completely forgiven from an Islamic point of view. Notably, though, a few participants who emphasized their strong belief in Islam stressed that mistreating people who use drugs results from superficial interpretation of Islamic doctrines. According to them, a Muslim's duty is to support his or her spiritual fellows and avert them from the wrong path. '[*T]he real Muslims should help their brothers and sisters to overcome this habit*', as a male pharmacist (age 52) from Dushanbe put it. However, a few participants justified ostracizing PWID who do not want to abstain from drugs on religious grounds, since they are *'persistent in their sin'* (a female student, 22, Dushanbe).

About one third of participants shared that they perceived drug use to be a crime and PWID as criminals; men were more likely than women to have this opinion. They stressed that people who start using drugs are aware of their illegal nature and negative consequences, which, according to these participants, constitutes a criminal behavior. A few participants justified their position by citing the experiences of other countries that imprison or even execute PWID. Overall, participants who held negative perceptions of drug use and dependence often were in favor of harsh treatment of PWID, as discussed below.

Labelling of PWID

Participants provided examples of labels affixed to PWID by society – *narcoman* (a medical term denoting a person dependent on drugs introduced by Soviet medicine), *nash'amand* (drug addict in Tajik), *gershik* (Russian slang name for heroin user). All participants mentioned that these names have strong negative connotations and are closely linked to negative stereotypes of PWID. A few participants mentioned that *narcoman* means a person with no purpose in life other than using drugs:

Interviewer: When you hear the word narcoman, who do you imagine?

Participant: [First], a person with addiction. Addicted to something that he cannot do without. Second, a person who does not know what to get from life, a purposeless person, with no future, someone who only harms others. […] Narcoman harms his family, he thinks only about finding money to buy drugs, or selling things to buy [drugs].

- Male student 22, Dushanbe.

All participants shared that attaching labels of *narcoman* or *gershik* to a person results in lowering his or her status in the society, as illustrated by the following quote:

When people hear that someone is narcoman, they turn away from him. For other people narcoman becomes a second-rate person, he becomes a curse for his family. People do not respect narcomans, they think about them […] as about a criminal or an insane [person]. […] This makes life for [a PWID] even worse, so he keeps using drugs to get away from this [negative treatment]. - Female pharmacist, 49, Kulob.

In addition to labels directly related to drug use, participants attached labels denoting the deviation of PWID from religious, moral and social norms (e.g. *sinners*, *life destroyers*, *criminals*, *madmen*).

Stereotyping PWID

Crime, aggression, and violence

One of the most frequently cited stereotypes of PWID was their propensity for crime and violence. While almost all participants mentioned that PWID may commit violence to find money for drugs, about a third of participants also shared that PWID may inflict harm to innocent people for no rational reason. These participants were also more likely to support punishment and isolation of drug users. Some of these participants, mostly pharmacy students, believed that it is a direct effect of drugs that makes an individual violent: "*After they inject, they*

become insane and can do anything. They can kill or rape someone" (a male student, 21, Dushanbe). A few participants also noted that PWID may force others into drug use just to increase the number of PWID. One of these participants was particularly vivid in portraying PWID as irrationally aggressive individuals:

> *Most of them are night-walkers, these drug users, so they may kidnap people who go out at night and forcefully inject them [with drugs], maybe to expand the circle of drug users. [PWID will inject] forcefully, with used syringes, sending the drug straight into their vein.* - Female student, 21, Dushanbe.

Notably, such exaggerated stereotypes of PWID were reported mostly by the students rather than by pharmacists. While most of the participants did not share such extreme view of PWID, many still noted that PWID are prone to involve others in drug use to profit from selling drugs to them.

Harm to family

All participants believed that PWID harm their families; almost half of them emphasized this as one of the main reasons for their negative attitudes towards PWID. According to the participants, PWID neglect parents, wives and children; steal from home or sell household belongings; trigger quarrels and commit violence against family members; and drain family financial resources. In addition, PWID affect the reputation of their families, and their relatives may suffer from stigma by association.

Almost all participants noted that PWID are bad parents. According to them, PWID fail to support their children financially, and create an adverse emotional environment by causing quarrels and violence. A few participants also mentioned that PWID may put the health of their

children at risk via mother-to-child transmission of blood-borne infections or via accidental needle-stick injuries from used syringes. A few participants suggested depriving PWID of parental rights, at least till they stop using drugs.

> *…[PWID] cannot raise good children. Their kids are always wandering on the streets, they also get used to stealing, fighting, cursing, lying since childhood, then they become criminals. If [a PWID] has some good relatives, [children] should be given to them. If not, kids should be taken to an orphanage, until their parents stop [using drugs]. Or, say, if a husband uses [drugs], then his wife should divorce him and take away the kids with her.* - Female pharmacist, 46, Dushanbe.

Harm to society

Several male pharmacists and students and one female student explained their negative attitudes towards PWID by the damage they cause to the society and the country. According to them, PWID harm society by involving others in drug use, stealing and committing other crimes, not working productively, and affecting the future of the nation by bearing sick children. Participants who held such views were more likely to support harsh measures against PWID. For instance, one participant justified forced treatment of PWID by citing damage to the country's reputation:

> *[PWID] ruin our society. When foreigners come to Tajikistan, they see [high rate of] drug use, they laugh at us, say we are a backward country […]. This affects the reputation of our country. So let them be forced [to treatment], especially those [PWID] who lay on the streets […].* - Male student, 23, Dushanbe.

Notably, a few participants stressed that not all PWID are inherently bad, and acknowledged that there may be good people using drugs. Nevertheless, these participants also believed that even being a good person, PWID may harm other people.

Controllability of drug use

About two thirds of participants who discussed the role of willpower in drug abstinence believed that an addicted person could stop using drugs if he or she truly wants to. However, most of these participants reported that PWID are weak, unmotivated people (these participants were also more likely to hold the view that drug use is a crime and a sin that deserves punishment):

> *The best solution to the problem is that PWID should stop using drugs. They should summon their willpower, should overcome their weakness, start managing their lives. But most of them are just weak people who want to indulge themselves.*
>
> *- Male pharmacist, 27, Dushanbe.*

On the other hand, about one third of participants (most of whom also believed that drug use is a disease), pointed out that stopping drug use only partially depends on the willpower of PWID; this view was particularly common among older pharmacists. They listed other factors such as peer pressure, support by family members, access to treatment, education and employment that may ensure sustainable abstinence.

Emotional responses

One of the common emotions triggered by PWID in participants is fear. Almost all of the participants who were asked to compare their perceptions of PWID and alcoholics indicated that they were more afraid of PWID. Participants mentioned that people may be afraid of crimes committed by PWIDs to find money to buy drugs or fear PWID involving others into drug use. Women and pharmacists were more fearful of PWID who may initiate participants' children into drug use:

> *God forbid if some of these drug users would approach my sons, would give them drugs, would deceive them. I am always worried about it when I hear that a young guy started [using drugs]. Any parent would be afraid of it.* - Female pharmacist, 49, Kulob.

Almost two thirds of participants also mentioned aggressive behavior of PWID when they are under influence of drugs or in withdrawal, as the reason they feel fear of PWID. Other negative emotions mentioned by a few participants were feelings of disgust and contempt. A male student, 23, Dushanbe first said that he does not experience any emotion towards PWID; however, after probing he conveyed that PWID '*should be exterminated*'.

On the other hand, about one third of men and more than half of women in the study reported feelings of pity and sympathy towards PWID. According to these participants, they pitied PWID since the latter ruin their young lives, commit sin by using drugs, harm their health, deprive themselves of positive life experiences and die early:

> *I don't feel any fear [towards PWID], they cannot harm me in any way. The only thing they can harm is their lives, their souls. He injects that drug, he harms himself with it. … My heart aches for [PWID], I feel pity towards them, because they are using this [forbidden] thing. So, it is not fear, it is sorrow and sadness that I feel, because they are ruining his life.* - Male student, 21, Dushanbe.

Participants who had relatives or friends who injected drugs tended to feel sympathy or pity towards them, while participants who encountered PWID at pharmacies only mostly talked about fear and disgust.

Status loss and discrimination

Rejection and ostracism

All participants reported that PWID are ostracized by their families, friends and neighbors. People try to avoid PWID, stop inviting them to

community events, or show them less respect (e.g. by seating them closer to doors in the room where a party or a meeting is taking place). Sometimes parents may publicly renounce their children if they find them using drugs. Families of PWID may also be rejected by community members. In particular, since arranged marriages are common in Tajikistan, young men and especially women from PWID families may have bleaker marriage prospects because of stigma:

> *[People's] attitude towards families [of PWID] may get worse as well. People will have less [contact] with them. Nobody would take a girl from their family [in an arranged marriage] or give their daughter to [a family of a PWID], people would see them as tainted. […] Everyone will be gossiping about them.*
>
> - Female pharmacist, 34, Dushanbe

Several participants who believed that drug use is a sin against Islam indicated that PWID should not be allowed to visit mosques, since "*their prayers cannot be accepted when they use drugs"* (male pharmacist, 45, Kulob). However, almost all participants who were asked this question disagreed with this position. Several participants were of the opinion that '*in the mosque, [a PWID] can pray, listen to preaching and persuasion of others, this can help him to stop [using drugs]*" (female student, 22, Dushanbe).

Although about three quarters of participants supported harm reduction programs, with pharmacists more likely to support these programs than students, in general, some of them shared

that they are against spending public resources on PWID who do not want to stop using drugs. Rather they would allocate available funds to primary prevention of drug use:

> *If they still keep using, then why waste all that money on them? If I had all that money [at my disposal], I would open more sports facilities, so kids don't do anything [illegal], so they don't hang out somewhere smoking [marijuana]. I would rather spend money for [prevention], than support chronic addicts who keep on using.*
>
> - Male student, 22, Dushanbe.

Many participants view PWID, in particular those who do not want to stop using drugs, as individuals with worthless lives and no future. A few participants, mostly men stressed that death of PWID from overdose or other reasons is the best outcome for everyone:

> *I think [PWID] are better off dead. […] They are not doing anything, just [using drugs]. Of course, their parents do not want them to die, however [bad] they are. But on the other hand, the society does not need a drug user, [if he dies], everyone will forget him soon. We had one in our village, everyone kept telling 'We wish he dies soon', people even mourn [PWID] less. They would mourn him, cry after him, then in a year it is over… Otherwise, he would keep making trouble every day, for himself and others. Well, if he dies, you would [mourn] for a year, that's it, you would forget him then.*
>
> - Male pharmacist, 45, Dushanbe.

At the same time, the vast majority of participants, when asked, stressed that each life, including that of a PWID, must be valued and mentioned that wishing death to someone is against Islam.

Isolation

About one quarter of participants (mostly men) indicated that PWID should be isolated from the rest of society via imprisonment or forced treatment. They reasoned that isolation would prevent PWID from committing crimes, involving others in drug use and transmitting blood-born infections. A few of them added that isolation would be beneficial for PWID themselves as it will sever their ties with drug dealers and thus will help PWID to recover from addiction. Most of the participants who believe that drug use is a crime were supportive of forced treatment, isolation and even imprisonment of PWID, if the latter do not want to receive treatment and stop using drugs. One participant referred to the experience of Soviet system of treatment and labor facilities (LTP - transliteration of the Russian acronym for "treatment and labor facilities") run by police:

> *[PWID] are sick, so they should be treated. But if they don't want to [be treated], or want to continue using drugs, then police should force them [to get treated]. [Government] should establish something like LTP, you know from old times, right? Like a prison, but not a prison, so they get their medicines strictly by regimen and no contacts [with outside] without permission. Let them work there after [an acute withdrawal] passes. Not a very hard work, nor an easy one, he should sweat a bit there. You will see, in a year he will get well there, he won't have cravings [for drugs] anymore. If he starts earning [for his work] there, his life will improve, he will [reconcile] with his family, he definitely will turn away from that path.* - Male pharmacist, 47, Dushanbe.

On the other hand, majority of participants disagreed with isolation and forced treatment of PWID. Most of them mentioned the ineffectiveness of isolation, pointing out the inability of treatment providers to ensure complete isolation and the need to address underlying problems,

such as unemployment or psychological problems that resulted in drug addiction. A few participants stressed that isolation is inhumane and should not be applied to PWID.

Power and stigma

Almost all participants who discussed the role of income in stigmatizing PWID shared that richer PWID experience less stigma from community members compared to poorer ones. They explained this by the fact that more affluent PWID do not need to steal, borrow or beg to find money to purchase drugs. In other words, more affluent PWID have fewer negative encounters with others and inflict less harm on them, thus triggering less outrage. In addition, participants mentioned that affluent people can help others and in general have higher status in the communities which also lessens stigma towards them:

> *The rich guy [who uses drugs is not stigmatized], but the poor guy definitely is. The rich guy, he has money, he doesn't depend on anyone, he manages his livelihood, he may even help his neighbors [financially]. Even if they know about [his using drugs], they will not tell him anything, they will show him respect, but maybe they will talk behind his back. But if a poor guy [uses drugs], he has no money, so he has to do some [inappropriate] things, like stealing, or, say, selling family belongings, or borrowing money. So, he will lose respect in the eyes of others, they can say bad things into his face.*
>
> - Male pharmacist, 33, Dushanbe.

At the same time, participants who reported that attitudes of community members depend on PWID income level, stressed that they personally treat rich and poor PWID in the same way.

Societal stigma

All participants indicated that society in general has very negative attitudes towards PWID. Those participants who reported positive or neutral attitudes towards PWID mentioned that other pharmacists as well as other society members treat PWID significantly worse than they did:

> *Sometimes I see, say, in other pharmacies, [a PWID] comes and asks for a syringe. And the pharmacist says, "Go away, I don't have any [syringes]". They talk to [PWID] in a very rude way, tell them to get lost. Well, [a PWID] is still a human, even if he does [drugs], you should support him.* - Male pharmacist, 32, Kulob.

Almost half of the participants believed that the stigmatization of PWID further isolates them and hampers the process of treatment and recovery, and some participants were against such maltreatment of PWID; these participants also were more likely to believe that drug dependence is a disease. However, several participants opined that the stigmatization of PWID plays a positive role as a drug use prevention strategy, since it sends a clear message to others to avoid drug use. A few participants supported stigmatizing PWID, arguing that drug use prevention is a more important task for the society than assisting those who use drugs:

> *Well, bad treatment of [PWID] is a good thing, it lets others see it and learn a lesson… Because, if [attitudes] get positive, then people will not be afraid [of using drugs]. […] If children see that people treat [PWID] badly, then they will think, 'Aha, nobody likes drug users, so let's stay away from [drugs]'. Otherwise, he would say, 'Well, looks like it is not a big deal, I can try'. […] Of course, [stigma] makes life harder for drug users, but on the other hand, I think it is more important not to let others to start [using drugs].*
>
> - Male pharmacist, 52, Dushanbe.

Access to syringes

While less than half of pharmacists and students acknowledged encountering PWID outside of pharmacies, almost all pharmacists had experience interacting with PWID in the pharmacies. A customer is suspected to be PWID when he or she asks for a syringe and an ampule of Dimedrole (brand name of antihistamine Dyphenhidramine) or Novocaine (local anesthetic). These two medicines can potentiate the effect of heroin and are used to dissolve heroin. A few participants also mentioned that PWID can be recognized by their wary or agitated gaze or a specific body odor, though the participants could not describe the smell.

Many male participants and some women, most of them from Kulob, stressed that they do not or would not sell syringes if they know or suspect the customer uses drugs. Often the reasons for refusing syringes were related to participants' negative perceptions of drug use and/or people who use drugs. Almost all of these participants saw providing syringes to PWID as encouraging drug use. Moral responsibility for encouraging drug use was a recurring theme. Many participants mentioned that they understood the benefits of providing syringes but preferred someone else to do it to avoid the moral burden:

> *You have to be morally prepared to sell syringes to a drug user… A person should be morally strong (laughter), [reasoning] like, 'OK, I will sell the syringes, the main thing is to prevent transmission [of HIV]'. But I cannot do it… If you think rationally, [providing syringes] may prevent HIV, this is an advantage. […] But […] if you realize that you sell the syringe and [a PWID] injects with it, it means you helped him [to use drugs]. So it is easier to think that it was not you who [sold the syringe], let it be someone else. Let [NSP] operate, but it is not you selling the syringe, but someone else, because it is morally hard…* -Female student, 23, Dushanbe.

Since PWID often die from overdose, a few participants considered drug use to be a suicidal action and stressed that they do not want to be associated with it, in particular since Islam condemns suicides:

> *I won't sell [syringes] to him, will refuse, will say I don't have them. […] Who knows, maybe […] he dies from [injecting with that syringe], you never can tell. […] suicide is a sin, I don't want to assist in suicide. If I don't sell him, it is just [10 cents], some other healthy person would buy it. I don't need his money, I just don't want to be part of his suicide.* - Male student, 21, Dushanbe.

More than a few pharmacists also mentioned that they do not sell syringes to PWID because of damage the former may inflict on the pharmacy and disrupt business:

> *[I don't sell syringes to PWID] because my pharmacy is [in a hospital area], it is a state [property]. If [PWID] come here, everything may happen. When they are in withdrawal, they can steal, they can do anything, that's why I won't sell them syringes.*
>
> - Female pharmacist, 35, from Kulob.

Several pharmacists, in particular those from Dushanbe, mentioned that state agencies (Pharmacy Monitoring Service, counter-narcotic law enforcement) may send their informants (some of whom may be PWID) to buy syringes from pharmacists and then impose sanctions for selling syringes without prescription.

A few participants, mostly those who felt sympathy towards PWID, also noted that they do not sell syringes to PWID acting in their best interests. Limited access to syringes may help PWID stop using drugs or avoid overdose, explained they. Another group of reasons for not selling syringes to PWID was related to syringe sale policies and enforcement of these policies.

A few pharmacists were confident that current policies prohibit syringe sales without prescription while several others believed that regulations explicitly prohibit sale of syringes to PWID.

Participants also shared reasons for selling syringes. A few pharmacists stated that they sell syringes out of sympathy to PWID who may otherwise suffer from not having a syringe to inject. One of these participants also added that PWID did not choose to be addicted and cannot control their habit.

In general, pharmacists were more likely to provide pragmatic explanations for their decisions related to selling syringes, while students more often referred to moral or emotional reasons. Pharmacists who reported selling syringes without prescription mentioned that selling syringes is part of business, or that refusing to sell syringes would not prevent PWID from buying them in another pharmacy. At the same time, students who supported provision of syringes to PWID, mentioned HIV prevention as well as sympathizing dire conditions of PWID in withdrawal. Pharmacists who were against selling syringes to PWID often cited potential problems with law enforcement or with PWID damaging pharmacy operations. Conversely, students tended to explain their reluctance to sell syringes by moral burden related to encouragement of drug use.

Overall, few participants were completely supportive of or totally against providing any access to syringes. About three fourths of participants agreed with some form of providing sterile injecting equipment to PWID. Most of them supported the idea of distributing syringes via designated community-based NSPs, stressing that these services are endorsed by the Government as HIV prevention programs. Still, the majority of these participants were against running NSPs in their pharmacies. Specifically, most of them mentioned that free distribution of syringes

would cause influx of PWID to the pharmacy resulting in theft, debauchery, or disruption of business. Almost all participants pointed out that state bureaucracy and frequent audits are an impediment for pharmacy-based syringe distribution; more than a few also mentioned high workload and lack of training to deal with PWID. A few women pharmacists cited fear of PWID and a husband's objection as reasons against working in pharmacy-based NSPs.

Discussion

Our study is the first to explore the stigmatizing attitudes of pharmacists and pharmacy students toward PWID in Central Asia. Furthermore, it is one of the first studies that addressed the attitudes of service providers in general towards PWID in this region. We identified several sub-themes related to stigma and discrimination against PWID by pharmacists and pharmacy students in Dushanbe and Kulob, Tajikistan, that are aligned with Link and Phelan's conceptualization of stigma (Link & Phelan, 2001; Link, Yang, Phelan, & Collins, 2004). We found that pharmacists and students assign PWID labels with negative connotations, hold negative stereotypes, and express negative emotional responses to PWID. Our participants brought examples of stigma enacted by themselves or other individuals, including rejection and isolation of PWID, supporting forced treatment, refusing access to syringes and other resources and services.

Our study suggests that stigma plays an important role in pharmacists' refusal to provide syringes to PWID. Stigma processes may interact with pharmacists' decision-making via various pathways. For instance, labelling PWID as sinners leads to perception of selling syringes to PWID as abetting sinful activities. Fear of PWID triggered by negative stereotypes about them as individuals prone to crime, aggression and inflicting damage also reduces willingness to interact

with PWID, including selling syringes. By holding stereotypes of PWID as individuals who choose to destroy their lives, families and society, pharmacists see selling syringes to them as encouragement of these moral transgressions. Similar findings were described for pharmacists throughout the world, though these studies were conducted outside of Central Asia (Coffin et al., 2000; Eades et al., 2011; Matheson et al., 1999; Rich et al., 2002; Taussig et al., 2002; Watson & Hughes, 2012).

In line with Link and Phelan's concept, power, and in particular affluence of PWID, may play a moderating role in expressing and enacting stigma towards PWID, with rich individuals eliciting less negative reactions and enjoying higher social status. Another example of the power differential that enables discrimination is the power of pharmacists to decide whether to sell syringes to a person who may "look" or "act" like a PWID (e.g., customers with anxious facial expression, or those who ask for a syringe and injectable antihistamine) or not.

From a theoretical standpoint, our findings suggest that the conceptual model of stigma proposed by Link and Phelan is applicable to the context of drug use in Tajikistan. At the same time, while stigma is acknowledged as a complex sociocultural phenomenon, there is a paucity of studies analyzing the impact of the sociocultural context on drug use stigma in developing Muslim countries such as Tajikistan. Therefore, it is important to discern broader sociocultural contextual factors explaining why and how the local context enables and maintains stigmatization of PWID in this country.

Collectivism, or the tendency of individuals to view themselves as part of the whole (e.g. family, society), is one such contextual factor that may contribute to the particular nature of stigma against PWID in Tajikistan. Due to their tight interdependence and high levels of surveillance among their members, collectivistic cultures harbor strictly defined and strongly

enforced social norms and group values. Therefore, the range of acceptable lifestyle choices in such cultures is narrower and behaviors deviating from traditional norms are less tolerated (Carpenter, 2000; Chick, 1997; Triandis, 2001). Empirical studies in China and the UK have shown associations between collectivist cultural norms and HIV and mental health stigmas (Papadopoulos, Foster, & Caldwell, 2013; Zang, Guida, Sun, & Liu, 2014) that are symbolically close to drug use stigma (Capitanio & Herek, 1999; Herek, Widaman, & Capitanio, 2005). Similar to other developing countries in Asia and Africa, society in Tajikistan is collectivistic and patriarchal, with group values and norms prevailing over individual choices and opinions (Harris, 2005). Our participants' disapproval of drug use even when no direct harm is inflicted on anyone may stem from such a collectivistic mindset, which might considering abstinence as the best outcome. Similarly, the stereotyped views of PWID as purposeless individuals ruining their own lives may be fueled by collectivistic resentment of the perceived disregard of common values of well-being and prosperity.

A specific type of collectivism is "vertical collectivism," which requires allegiance of individuals to the hierarchical structures (family, tribe, country) to which they belong (Singelis, Triandis, Bhawuk, & Gelfand, 1995). Participants' stereotyping of PWID as irresponsible individuals harming families, society and country, and the inclination of the former to punish PWID on these grounds can be viewed as manifestations of vertical collectivism. Vertical collectivism is conceptually related to paternalism, another cultural characteristic of patriarchal societies (see, e.g. Ho & Chiu, 1994). In our study, the influence of paternalism can be seen in participants' denying the right of individuals to use drugs, justifying refusal to sell syringes as being in the best interests of PWID and supporting mandatory treatment of PWID. These paternalistic attitudes based on the stereotype of an incompetent PWID may facilitate

discrimination against the latter by belittling them and denying their autonomy. On the other hand, the benevolent paternalism of some service providers experiencing sympathy towards PWID may be conducive for promotion of services for this population. Therefore, the programs addressing stigma towards PWID should maintain the balance between the principles of respect for autonomy and beneficence (see, e.g. Woodward, 1998), both promoting the need for services for PWID and highlighting that despite drug use most PWID remain rational and capable individuals. Endorsing respect for PWID autonomy should also involve refuting the belief that abstinence is the only positive outcome for PWID.

Our study suggests that religion is yet another sociocultural factor influencing Tajikistani pharmacists' attitudes towards PWID. Islam's prohibition of drug use has triggered strong opposition to harm reduction programs in some Islamic countries (Narayanan et al., 2011). Some of our participants, too, viewed drug use as a sin and believed that providing syringes to PWID is abetting a sin. However, it would be precipitous to conclude that providers' religiosity presents an insurmountable barrier for providing harm reduction services. Our findings show that service providers with a high level of religiosity may perceive helping fellow Muslims who use drugs as their spiritual duty. These findings imply that religious teaching can be applied to advocate for harm reduction services. Positive examples can be found in Malaysia and Iran, where harm reduction programs referred to Islamic values such as the prescription to protect the "faith, life, intellect, progeny and wealth" of every Muslim (Kamarulzaman & Saifuddeen, 2010, p. 116).

Our findings show that collectivism, paternalism and religion, key elements of Tajikistan's sociocultural context, may contribute to the emergence and manifestation of stigma towards PWID in this country. Since adherence to social norms is at the core of each of these sociocultural constructs, it is likely that they do not influence stigma independently from each

other but are mediators of a more distal and overarching psychosocial phenomenon. Social and moral conservatism that encourages and enforces adherence to existing social and moral norms can fuel stigma against PWID in Tajikistan and other countries with similar sociocultural environments. Literature shows that social conservatism is positively associated with vertical collectivism and religiosity, and that all these factors are correlated with stigma and prejudice (Altemeyer & Hunsberger, 1992; Clay, Terrizzi, & Shook, 2012; Gudykunst et al., 1992; Janoff-Bulman & Carnes, 2013; Sibley & Duckitt, 2008).

Further, conservative worldviews can also be linked to stigmatizing PWID through the stereotype of the controllability of drug use (Brener, Hippel, Kippax, & Preacher, 2010), a sub-theme that emerged in our study as well. We found that a majority of our participants believe PWID are personally responsible for their drug using habits and lack the willpower to abstain. At the same time, these beliefs suggest that pharmacists and pharmacy students may have limited knowledge about the nature of drug dependence and that further training is required to address myths and misconceptions about drug dependence.

The influence of the cultural context, including socially conservative and collectivistic norms, on stigmatization of PWID may be moderated by individual characteristics. Thus, differences in stereotypes related to PWID or rationales behind the decision to sell or refuse syringes may be explained by differences in students' and pharmacists' life and professional experiences, including various level of exposure to PWID. Generational differences in expressing stigma against marginalized populations at risk for HIV were found by Balabanova et al. (2006) for Russia.

In addition to the cultural context, we also identified how policy-related structural factors shape stigma and discrimination against PWID in Tajikistan. Ambiguous policies regulating

syringe sales allow pharmacists to arbitrarily refuse to sell injecting equipment to PWID. Another example is use of the derogatory label *narcoman* for PWID. It should be noted that *narcomania* was an official diagnosis assigned by Soviet medicine to people with drug dependency (Latypov, 2011). *Narcomania* is still the official term for drug dependence used in Tajikistan's *Law on Narcological Aid,* adopted in 2003. Use of derogatory labels by well-meaning service providers may indicate a lack of locally accepted neutral terms to denote people with drug dependency problems and highlights the need for introducing more neutral terms into public health policies and practice.

Our findings highlight the importance of background contextual factors such as culture and policies in analyzing sources of stigma and its impact on the health of marginalized populations. The global literature has only relatively recently started conceptualizing the relationship between contextual factors and stigma. While we have identified no models for drug use stigma, there have been two frameworks published for mental illness stigma that are relevant. Pescosolido and colleagues (2008) compiled a comprehensive Framework Integrating Normative Influences on Stigma (FINIS) encompassing a wide range of macro-, meso- and micro-environmental factors influencing mental health stigma. Abdullah and Brown (2011) proposed a more focused concept explaining how ethnocultural beliefs and norms influence various components of mental illness stigma (cues, stereotypes, prejudice and discrimination). Authors of both frameworks acknowledge the lack of empirical research on the role and pathways of contextual factors in engendering stigma in various cultures and societies. Overall, there is a paucity of publications examining stigma antecedents in developing countries, including countries with predominantly Muslim populations. Our study is one of the initial steps to fulfill this gap for Tajikistan, and, more broadly, for the region of post-Soviet Central Asia.

Further research should use quantitative designs to assess the relationships between sociocultural context, policies, stigmatization of PWID and their access to prevention services. Public health programs should undertake a multipronged approach to promoting the accessibility of sterile injection equipment. These activities include teaching pharmacists and students about harm reduction principles; revising policies regulating syringe sales and legislation on aiding and abetting drug use so that they clearly allow sales, and ensuring that all relevant parties are aware of their stipulations; and disseminating culturally appropriate messages addressing the faith-based concerns of pharmacists and other service providers. Educational and advocacy activities should involve and be delivered in collaboration with the National Pharmacy Monitoring service, law enforcement and religious leaders.

Strengths and limitations

We assessed the study strengths and limitations utilizing Maxwell's (1992) framework of qualitative research validity. To enhance the study findings' descriptive validity, all interviews were audio-recorded, transcribed verbatim and analyzed in the original languages. The first author (UI), a native of Tajikistan deeply familiar with the local socio-cultural context, conducted all interviews and analyzed the results, thus enhancing interpretative validity. However, the theoretical validity of the study results may be limited since categorization of codes into predefined stigma constructs might have not taken into account subtle variations in processes and meanings related to participants' attitudes towards PWID. In addition, the number of student participants was not large enough to reach a theoretical saturation of stigma-related themes among this subsample.

Conclusion

Our study is the first to explore stigmatization of PWID by service providers in post-Soviet Central Asia. We demonstrated the multifaceted nature of stigma against PWID in Tajikistan and its role in shaping pharmacists' attitudes towards provision of services to this population. Our findings suggest that the local sociocultural context, in particular religious beliefs, collectivistic mentality and, in a broader sense, social conservatism, may facilitate stigmatizing beliefs and attitudes. We have also shown how structural factors, such as policies and their implementation, may tip the power balance between pharmacists and PWID and affect the accessibility of syringes for PWID. Although the global literature offers conceptual models outlining the effect of contextual and structural factors on stigma, there is a lack of empirical evidence supporting applying these models to developing countries and understudied cultures. Our study is the first step in addressing this gap for the countries of post-Soviet Central Asia.

Tables

Table 1.1 Demographic characteristics of pharmacists and pharmacy students interviewed in Dushanbe and Kulob cities of Tajikistan (N=28)

Characteristics	n	%
Professional status		
Pharmacists	19	67.9
Students	9	32.1
Gender		
Men	11	39.3
Women	17	60.7
City of residence		
Dushanbe	19	67.9
Kulob	9	32.1

References

Abdul-Quader, A. S., Feelemyer, J., Modi, S., Stein, E. S., Briceno, A., Semaan, S., . . . Des Jarlais, D. C. (2013). Effectiveness of structural-level needle/syringe programs to reduce HCV and HIV infection among people who inject drugs: a systematic review. *AIDS and Behavior, 17*(9), 2878-2892.

Abdullah, T., & Brown, T. L. (2011). Mental illness stigma and ethnocultural beliefs, values, and norms: An integrative review. *Clinical Psychology Review, 31*(6), 934-948. doi:http://dx.doi.org/10.1016/j.cpr.2011.05.003

Adebajo, S., Obianwu, O., Eluwa, G., Vu, L., Oginni, A., Tun, W., . . . Idogho, O. (2014). Comparison of Audio Computer Assisted Self-Interview and Face-To-Face Interview Methods in Eliciting HIV-Related Risks among Men Who Have Sex with Men and Men Who Inject Drugs in Nigeria. *PloS one, 9*(1), e81981.

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion, 2*(2), 113-133.

Balabanova, Y., Coker, R., Atun, R. A., & Drobniewski, F. (2006). Stigma and HIV infection in Russia. *AIDS care, 18*(7), 846-852. doi:10.1080/09540120600643641

Beardsley, K., & Latypov, A. (2012). *Policy Analysis and Advocacy Decision Model for HIV-Related Services: People Who Inject Drugs.* Retrieved from Washington, DC:

Boymatov, A. (2015, May 2, 2015).

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Brener, L., Hippel, W. V., Kippax, S., & Preacher, K. J. (2010). The role of physician and nurse attitudes in the health care of injecting drug users. *Substance use & misuse, 45*(7-8), 1007-1018.

Buchanan, J., & Young, L. (2000). The war on drugs--a war on drug users? *Drugs; Education, Prevention and Policy, 7*(4), 409.

Capitanio, J. P., & Herek, G. M. (1999). AIDS-related stigma and attitudes toward injecting drug users among Black and White Americans. *American Behavioral Scientist, 42*(7), 1148-1161.

Carpenter, S. (2000). Effects of cultural tightness and collectivism on self-concept and causal attributions. *Cross-cultural research, 34*(1), 38-56.

Chick, G. (1997). Cultural complexity: The concept and its measurement. *Cross-cultural research, 31*(4), 275-307.

Clay, R., Terrizzi, J. A., Jr., & Shook, N. J. (2012). Individual differences in the behavioral immune system and the emergence of cultural systems. *Social Psychology, 43*(4), 174-184. doi:10.1027/1864-9335/a000118

Coffin, P. O., Linas, B. P., Factor, S. H., & Vlahov, D. (2000). New York City pharmacists' attitudes toward sale of needles/syringes to injection drug users before implementation of law expanding syringe access. *Journal of Urban Health, 77*(4), 781-793.

Des Jarlais, D. C., Paone, D., Milliken, J., Turner, C. F., Miller, H., Gribble, J., . . . Friedman, S. R. (1999). Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: a quasi-randomised trial. *The Lancet, 353*(9165), 1657-1661.

Dutta, A., Wirtz, A. L., Baral, S., Beyrer, C., & Cleghorn, F. R. (2012). Key harm reduction interventions and their impact on the reduction of risky behavior and HIV incidence among people who inject drugs in low-income and middle-income countries. *Current Opinion in HIV and AIDS, 7*(4), 362-368.

Eades, C. E., Ferguson, J. S., & O'Carroll, R. E. (2011). Public health in community pharmacy: a systematic review of pharmacist and consumer views. *BMC Public Health, 11*(1), 582.

Goffman, E. (1963). *Stigma: Notes on a spoiled identity*: Englewood Cliffs, NJ: Prentice-Hall.

Government of Tajikistan. (2015). *UNGASS Country Progress Report, 2015*. Retrieved from http://www.unaids.org/sites/default/files/country/documents/TJK_narrative_report_2015.pdf

Gudykunst, W. B., Gao, G., Schmidt, K. L., Nishida, T., Bond, M. H., Leung, K., . . . Barraclough, R. A. (1992). The Influence of Individualism Collectivism, Self-Monitoring, and Predicted-Outcome Value on Communication in Ingroup and Outgroup Relationships. *Journal of Cross-Cultural Psychology, 23*(2), 196-213. doi:10.1177/0022022192232005

Harris, C. (2005). Desire versus Horniness: sexual relations in the collectivist society of Tajikistan. *Social Analysis*, 78-95.

Herek, G. M., Widaman, K. F., & Capitanio, J. P. (2005). When sex equals AIDS: Symbolic stigma and heterosexual adults' inaccurate beliefs about sexual transmission of AIDS. *Social Problems, 52*(1), 15-37.

Ho, D. Y.-F., & Chiu, C.-Y. (1994). Component ideas of individualism, collectivism, and social organization: An application in the study of Chinese culture. In U. Kim, H. C. Triandis, C. Kagitcibasi, S. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method and applications.* (Vol. 18, pp. 251–266). California, USA: Sage Publications, Inc.

Janoff-Bulman, R., & Carnes, N. C. (2013). Surveying the moral landscape moral motives and group-based moralities. *Personality and Social Psychology Review*, 1088868313480274.

Kamarulzaman, A., & Saifuddeen, S. (2010). Islam and harm reduction. *International Journal of Drug Policy, 21*(2), 115-118.

Khashimova, U. (2010). *The Islamist Insurgency in Tajikistan*. Retrieved from http://old.cacianalyst.org/?q=node/5422

Latypov, A. (2009). Understanding post 9/11 drug control policy and politics in Central Asia. *International Journal of Drug Policy, 20*(5), 387-391. doi:http://dx.doi.org/10.1016/j.drugpo.2008.11.002

Latypov, A. (2011). The Soviet doctor and the treatment of drug addiction:" A difficult and most ungracious task". *Harm reduction journal, 8*(1), 1.

Latypov, A. (2012). *On the Road to "H": Narcotic Drugs in Soviet Central Asia*. Retrieved from http://037eabf.netsolhost.com/wordpress/wp-content/uploads/2013/10/Research_Paper_1.pdf

Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual review of Sociology*, 363-385.

Link, B. G., Yang, L. H., Phelan, J. C., & Collins, P. Y. (2004). Measuring mental illness stigma. *Schizophrenia bulletin, 30*(3), 511-541.

MacArthur, G. J., van Velzen, E., Palmateer, N., Kimber, J., Pharris, A., Hope, V., . . . Goldberg, D. (2014). Interventions to prevent HIV and hepatitis C in people who inject drugs: a review of reviews to assess evidence of effectiveness. *International Journal of Drug Policy, 25*(1), 34-52.

Matheson, C., Bond, C. M., & Mollison, J. (1999). Attitudinal factors associated with community pharmacists' involvement in services for drug misusers. *Addiction, 94*(9), 1349-1359.

Maxwell, J. (1992). Understanding and validity in qualitative research. *Harvard educational review, 62*(3), 279-301.

Mills, H. L., White, E., Colijn, C., Vickerman, P., & Heimer, R. (2013). HIV transmission from drug injectors to partners who do not inject, and beyond: Modelling the potential for a generalized heterosexual epidemic in St. Petersburg, Russia(). *Drug and alcohol dependence, 133*(1), 242-247. doi:10.1016/j.drugalcdep.2013.04.028

Ministry of Health of Tajikistan. (2014). *Results of sentinel surveillance among injecting drug users in Tajikistan, 2014*. Retrieved from

Morris, M., Podhisita, C., Wawer, M. J., & Handcock, M. S. (1996). Bridge populations in the spread of HIV/AIDS in Thailand. *AIDS (London, England), 10*(11), 1265-1271.

Narayanan, S., Vicknasingam, B., & Robson, N. M. H. (2011). The transition to harm reduction: Understanding the role of non-governmental organisations in Malaysia. *International Journal of Drug Policy, 22*(4), 311-317.

Otiashvili, D., Latypov, A., Kirtadze, I., Ibragimov, U., & Zule, W. (2016). Drug preparation, injection, and sharing practices in Tajikistan: a qualitative study in Kulob and Khorog. *Substance abuse treatment, prevention, and policy, 11*(1), 1-8. doi:10.1186/s13011-016-0065-2

Palmateer, N., Kimber, J., Hickman, M., Hutchinson, S., Rhodes, T., & Goldberg, D. (2010). Evidence for the effectiveness of sterile injecting equipment provision in preventing

hepatitis C and human immunodeficiency virus transmission among injecting drug users: a review of reviews. *Addiction, 105*(5), 844-859.

Papadopoulos, C., Foster, J., & Caldwell, K. (2013). 'Individualism-Collectivism' as an Explanatory Device for Mental Illness Stigma. *Community Mental Health Journal, 49*(3), 270-280. doi:10.1007/s10597-012-9534-x

Perlis, T. E., Des Jarlais, D. C., Friedman, S. R., Arasteh, K., & Turner, C. F. (2004). Audio-computerized self-interviewing versus face-to-face interviewing for research data collection at drug abuse treatment programs. *Addiction, 99*(7), 885-896.

Pescosolido, B. A., Martin, J. K., Lang, A., & Olafsdottir, S. (2008). Rethinking theoretical approaches to stigma: a Framework Integrating Normative Influences on Stigma (FINIS). *Social science & medicine (1982), 67*(3), 431-440. doi:10.1016/j.socscimed.2008.03.018

Rhodes, T., Lowndes, C., Judd, A., Mikhailova, L. A., Sarang, A., Rylkov, A., . . . Alpatova, T. (2002). Explosive spread and high prevalence of HIV infection among injecting drug users in Togliatti City, Russia. *Aids, 16*(13), F25-F31.

Rich, J. D., Martin, E. G., Macalino, G. E., Paul, R. V., McNamara, S., & Taylor, L. E. (2002). Pharmacist support for selling syringes without a prescription to injection drug users in Rhode Island. *Journal of the American Pharmacists Association, 42*(6s2), S58-S61.

Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*(3), 248-279.

Simoes, A. A., Bastos, F. I., Moreira, R. I., Lynch, K. G., & Metzger, D. S. (2006). A randomized trial of audio computer and in-person interview to assess HIV risk among drug and alcohol users in Rio De Janeiro, Brazil. *Journal of substance abuse treatment, 30*(3), 237-243.

Singelis, T. M., Triandis, H. C., Bhawuk, D. P., & Gelfand, M. J. (1995). Horizontal and vertical dimensions of individualism and collectivism: A theoretical and measurement refinement. *Cross-cultural research, 29*(3), 240-275.

Smolak, A. (2010). Contextual factors influencing HIV risk behavior in Central Asia. *Culture, health & sexuality, 12*(5), 515-527. doi:10.1080/13691051003658135

Tajikistan Statistics Agency. (2014). *Regions of Tajikistan*. Retrieved from http://www.stat.tj/ru/img/c476d0ddf3ea68cc502ba419312173a6_1418985745.pdf

Taussig, J., Junge, B., Burris, S., Jones, T. S., & Sterk, C. E. (2002). Individual and structural influences shaping pharmacists' decisions to sell syringes to injection drug users in Atlanta, Georgia. *Journal of the American Pharmacists Association, 42*(6s2), S40-S45.

Tilson, H., Aramrattana, A., Bozzette, S., Celentano, D., Falco, M., Hammett, T., . . . Schottenfeld, R. (2007). *Preventing HIV infection among injecting drug users in high-risk countries: an assessment of the evidence*.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of personality, 69*(6), 907-924.

Watson, T., & Hughes, C. (2012). Pharmacists and harm reduction: a review of current practices and attitudes. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada, 145*(3), 124-127. e122.

Wodak, A., & Cooney, A. (2004). *Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users*. Retrieved from Geneva: http://www.who.int/entity/hiv/pub/prev_care/effectivenesssterileneedle.pdf?ua=1

Zang, C., Guida, J., Sun, Y., & Liu, H. (2014). Collectivism culture, HIV stigma and social network support in Anhui, China: a path analytic model. *AIDS Patient Care STDS, 28*(8), 452-458. doi:10.1089/apc.2014.0015

Chapter 3. Structural equation modelling of pharmacists' attitudes and practices about selling sterile syringes to people who inject drugs in Tajikistan

ABSTRACT

Introduction. In Tajikistan, governmental policies leave the decision whether or not to sell syringes to people who inject drugs (PWID) to pharmacists' discretion. This study tests a theory-driven model explaining Tajikistani pharmacists' actual syringe sale practices to inform future HIV advocacy activities.

Methods. Data were collected via attempts to purchase syringes without prescription and a subsequent survey among a sample of 232 pharmacists in two cities (Dushanbe and Kulob) in Tajikistan in 2015. The survey collected data on attitudes and beliefs related to selling syringes to PWID, stigma against PWID and background contextual factors such as social conservatism, HIV and drug use knowledge. Structural equation modelling assessed the relationships between syringe sale practice and pharmacists' attitudinal and background factors.

Results. The majority (87.9%, n=204) of sampled pharmacists agreed to sell syringes without a prescription. According to the final model, agreeing to sell syringes was associated with the reported intent to provide syringes without prescription (β=0.36, p<0.001), lower stigma against PWID (β=-0.43, p=0.01), and stronger social conservatism (β=0.35, p=0.02). Intent to provide syringes correlated with positive attitudes towards provision of syringes (β=0.35, p=0.008), which in turn were negatively associated with stigma (β=-0.54, p<0.001) and positively with age (β=0.20. p=0.03). Stigma against PWID was directly associated with social conservatism (β=0.47, p<0.001) and inversely with university-level education (β=-0.28, p<0.001).

Conclusion: We demonstrated the availability of over-the-counter syringes in urban pharmacies of Tajikistan and emphasized the role of stigma in shaping pharmacists' syringe sale practices.

Advocacy interventions should target pharmacists to reduce stigmatization of PWID and ensure uninterrupted access to clean syringes.

Introduction

Tajikistan, the poorest post-Soviet republic in Central Asia, is experiencing twin epidemics of HIV and hepatitis C virus (HCV) among people who inject drugs (PWID). In 2014 national prevalence estimates of these infections among PWID were 12.9% and 22.7%, respectively (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014). In urban areas prevalence may be higher – a 2015 study found that 26.5% of surveyed PWID in Khujand and Kulob tested positive for HIV (Zule, Otiashvili, Latypov, Bangel, & Wechsberg). Sharing non-sterile injecting equipment remains one of the main factors fueling these epidemics (Government of Tajikistan, 2015).

Providing access to sterile needles and syringes has been shown to reduce the prevalence of risky injection practices, and thus to contribute to curbing HIV and HCV epidemics among PWID (Abdul-Quader et al., 2013; Dutta et al., 2012; Palmateer et al., 2010). Nevertheless, existing community-based needle and syringe programs (NSPs) operating in Tajikistan as part of the national AIDS response cannot meet all the needs of PWID (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014; Otiashvili et al., 2016). In Tajikistan, as in many other countries, PWID may buy syringes from pharmacies if NSP services are unavailable in the area or if injecting equipment is needed when NSPs are closed (Otiashvili et al., 2016). However, existing regulations neither directly prohibit nor explicitly allow sales of syringes without a prescription, thus effectively leaving this decision to pharmacists' discretion (Beardsley & Latypov, 2012; Boymatov, 2015). A recent qualitative study conducted among PWID in Tajikistan showed that pharmacists may refuse to sell syringes to PWID, mistreat them, or report them to the police, which limits their access to sterile injecting equipment (Otiashvili et al.,

2016). The qualitative study conducted within this dissertation research revealed that stigma towards PWID may be the main reason for pharmacists' refusing syringes to PWID. Specifically, pharmacists may refuse syringes since they believe that injecting drug use is a sin according to Islam, or that PWID endanger themselves, their families and the society (see Chapter 2). These findings are in line with publications from other parts of the world suggesting that pharmacists' attitudes towards PWID play a critical role in limiting access to sterile injection equipment and other services (Coffin et al., 2000; Eades et al., 2011; Matheson et al., 1999; Rich et al., 2002; Taussig et al., 2002; Watson & Hughes, 2012). Other factors potentially influencing Tajikistani pharmacists' decision to sell syringes over-the-counter include actual or perceived policy barriers, enforcement of policies by state authorities (e.g., police, the Pharmacy Monitoring Service responsible for oversight and regulation of pharmacies in the country), and perceived social norms related to providing syringes to PWID (Ibragimov, in progress-a) .

The absence of pharmacy-based NSP (PBNSP) where PWID may receive free syringes, information and referral from a friendly provider represents yet another impediment to services in Tajikistan. Global evidence shows that PBNSPs can be effective in reducing HIV transmission among PWID and ensuring their access to other prevention and treatment services (MacArthur et al., 2014; Tilson et al., 2007; Wodak & Cooney, 2004). While community-based NSPs operate legally in all provinces of Tajikistan, establishment of PBNSP outlets would require, among other things, the close cooperation and willingness of pharmacists to provide syringes to PWID.

Understanding factors influencing pharmacists' decisions related to selling or distributing syringes to PWID may help in promoting PBNSP among pharmacists. Specifically, it is important to discern the effect of stigma against PWID on pharmacists' decision-making, and identify what factors may trigger stigmatizing attitudes. Stigma does not develop in a vacuum,

but is closely tied to the sociocultural context of the society, being part of social relationships, as indicated by Goffman (1963). Thus, past literature as well as our findings described in Chapter 2 suggest that stigma against PWID and other marginalized groups may be a manifestation of social and religious conservatism (Altemeyer & Hunsberger, 1992; Brener & Von Hippel, 2008; Ibragimov, in progress-a; Kamarulzaman & Saifuddeen, 2010; Laythe, Finkel, & Kirkpatrick, 2001; Narayanan et al., 2011). Other factors related to sigma include knowledge of HIV and drug use related issues (Ding et al., 2005; Scott & Mackridge, 2009) and personal and professional encounters with PWID (Brener, von Hippel, & Kippax, 2007; Palamar, Kiang, & Halkitis, 2011; Taussig et al., 2002).

In addition to stigma, pharmacists' beliefs about public health and community-related outcomes associated with providing sterile syringes to PWID may also play a role in their decision-making. Specifically, beliefs in the benefits such as reducing HIV and HCV infections have been found to be associated with positive attitudes towards providing syringes to PWID (Pollini et al., 2014; Rich et al., 2002). At the same time, perceived negative consequences of providing syringes (e.g., encouraging drug use; communities littered with used needles; disruption of pharmacy work by aggressive PWID) may reduce pharmacists' willingness to sell syringes to PWID (Amesty, Blaney, Crawford, Rivera, & Fuller, 2012; Rich et al., 2002).

Promoting access to clean needles and syringes and other pharmacy-based HIV prevention services would require developing comprehensive models explaining pharmacists' willingness to provide services to PWID. However, no models encompassing socio-cultural contextual factors, stigma towards PWID, attitudes towards provision of syringes and syringe sale practices have been published. Our study fills this gap by testing a model guided by IBM (Integrated Behavioral Model) (Montano & Kasprzyk, 2008) framework explaining syringe sale

practices of pharmacists in Tajikistan.

Theoretical Framework

Based on IBM, our study framework states that actually providing syringes to PWIDs is explained by the *intent* to sell syringes, which, in turn, is influenced by *attitudes*, *perceived norms*, and *self-efficacy* related to this behavior. *Stigma against PWID* and its predecessors – *social conservatism, perceived drug use controllability*, *HIV and harm reduction knowledge* and *personal exposure to PWID* are key background constructs in the model (see Theoretical Framework section).

Methods

Overview and Setting

The study had two forms of data collection: (1) an audit of pharmacies to determine if they would sell syringes without a prescription, and (2) a survey of pharmacists who worked at the audited pharmacies. The syringe purchase audit assessed actual syringe sale practices, while the survey collected data on pharmacists' attitudes and beliefs related to selling syringes to PWID, stigma against PWID and background contextual factors.

The study was conducted in two cities in Tajikistan, Dushanbe and Kulob, in May-June 2015. Dushanbe, the capital city with a population of 776,000 [the largest in the country (Tajikistan Statistics Agency, 2014)], was selected as a study site because it contains the largest PWID population in the country (Ministry of Health of Tajikistan, 2014). Kulob [population: 100,000 (Tajikistan Statistics Agency, 2014)] was chosen because it is the largest city in the Khatlon province that borders Afghanistan (Tajikistan Statistics Agency, 2014). Both cities have

a wide range of free HIV-related services targeting PWID including NSP, pilot opioid substitution treatment (OST) programs, and HIV testing and treatment (Government of Tajikistan, 2015).

Data Collection

Syringe purchase audit. A syringe purchase audit (or test), the primary outcome of the model, is a proxy method to assess pharmacists' actual practices related to OTC sales of syringes (Compton et al., 2004; Fedorova et al., 2013; Pollini et al., 2010). It involved a "mock client," here a research assistant (RA), who attempted to buy syringes without a prescription in the sampled pharmacies. We modified the syringe purchase audit protocol described by Compton et al. (2004) in accordance with the local drug-use practices. In particular, the test involved the attempt to purchase a 2-ml syringe and a vial of injectable Diphenhydramine (Dimedrol), an antihistamine medicine often mixed with heroin by PWID in Tajikistan (Zule et al., 2015).

We selected pharmacies via systematic random sampling from the list of registered pharmacies provided by the National Pharmaceutical Monitoring Service (NPMS) for Dushanbe and Kulob. The number of pharmacies sampled in each city was approximately proportionate to the total number of pharmacies in each city at the time of data collection. The sampling frame consisted of 461 pharmacies in Dushanbe and 122 in Kulob. Given the exploratory nature of the study, the sample size was based on the rule of thumb that sample should not be smaller than 200 (Kline, 2014). Anticipating a 25% potential refusal rate (or some pharmacies being closed), we sampled 250 pharmacies (180 in Dushanbe and 70 in Kulob).

We hired and trained eight RAs and instructed them to work in pairs (three in Dushanbe and one in Kulob). For safety reasons, RAs visited sampled pharmacies during the daytime only.

No replacement sampling for the pharmacies closed by the time of RA team's arrival has been made.

In accordance with the standardized study protocol and script, one of RAs (a young male) approached the pharmacy worker (any person present at the counter) at the sampled pharmacies and asked for a 2-ml syringe and a Dimedrol ampule without providing a prescription. If more than one pharmacist was present at the sampled pharmacy (most pharmacies in Tajikistan have only one employee, who must be a pharmacist), the RA chose the participant on the spot using convenience sampling method. If the pharmacist agreed to sell, the RA requested to see the syringe and Dimedrol for a visual inspection (a common practice of Tajikistan pharmacy customers). If the pharmacist produced the syringe and Dimedrol, the RA would refuse the purchase under a pretext and the attempt was recorded as positive. If the pharmacist refused to sell a syringe or said that the pharmacy had no syringes, the RA would leave without confrontation and the purchase audit result was recorded as negative. Another RA waited outside the pharmacy to ensure there is no security risk for the first RA. The syringe purchase audit did not involve deception – RAs were instructed not to look or act like a stereotypical PWID (e.g. by wearing shabby clothing, showing anxiety or using specific slang). After the purchase audit was finished, the RA exited the pharmacy without debriefing the pharmacist to avoid priming the subsequent survey results.

Survey. Right after the purchase audit another RA approached the same pharmacist and informed them about the study and the opportunity to take part in the survey. If the sampled pharmacist expressed interest, RA screened her or him for eligibility, and obtained oral informed consent. Inclusion criteria were (a) 18 years old and above, (b) being an employee or owner of a pharmacy, and (c) willingness to provide informed consent. Data were successfully collected

from 232 pharmacists (166 in Dushanbe and 66 in Kulob) with the overall response rate of 92.8%. Pharmacists who agreed to participate in the survey were debriefed about the syringe purchase audit upon completion of the survey and were provided the opportunity to delink their survey answers from the purchase audit result. Pharmacists who declined to take part in the survey were also debriefed about the syringe purchase audit.

The questionnaire was developed by translating the original measures from English to Tajik and Russian languages, modifying as described above, then translating to English and independently back-translating to Tajik and Russian to ensure the validity of both versions. Pre-testing of the questionnaires was conducted among a separate convenience sample of pharmacists (n=25). Data were collected via a computer-assisted self-interview (CASI) questionnaire in Tajik or Russian languages. No personally identifying information was collected, the pharmacy addresses were not linked to the survey data to ensure the confidentiality of the respondents. We offered USD $8 in local currency to pharmacists as a compensation for their time and efforts. The study was approved by the Medical Ethics Committee of the Ministry of Health of Tajikistan and the Emory University Institutional Review Board.

Measures

Syringe purchase audit. The results of syringe purchase audit were recorded as 'agreed to sell a syringe' ('1') or 'refused' ('0').

Survey. All survey measures were based on instruments published in the literature. We adjusted several of them as specified below based on the results of the qualitative study conducted among pharmacists and pharmacy students in Dushanbe and Kulob in November – December 2014 (Ibragimov, in progress-a).

The *behavioral intent scale* included three items measuring willingness to provide syringes to PWID (a typical item was *'I am willing to sell syringes to known or suspect PWID without prescription*') with a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert type response scale. Higher scores correspond to higher willingness to provide syringes.

The scale measuring *attitudes towards providing syringes to PWID* consisted of 13 items. Two of them were direct measures of attitudes (e.g. "*In general, is selling syringes to PWID without prescription good or bad?")* with response options ranging from '*very bad*' (1) to '*very good*' (5). The rest of the items measured the likelihood of positive (e.g. "Reduces HIV transmission") and negative (e.g. *"Encourages drug use"*) outcomes of providing syringes to PWID measured on a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert type response scale. This measure was adapted from a scale by Mashburn (2003) by adding items derived from our formative qualitative work (e.g. "*Will lead to problems with the state inspecting agencies*"). We also changed the original 7-point *'very likely' – 'very unlikely'* response scale to a 5-point Likert scale as pre-test participants indicated their preference for the latter. The higher scores indicate more positive attitudes towards providing syringes to PWID.

Perceived norms were assessed by asking participants about whether individuals who they consider important (referent persons) approve providing syringes to PWID (*normative beliefs*) and if participants would follow a referent persons' advice on this matter (*motivation to comply*). The list of referent persons (pharmacy owner or staff, other pharmacists, Pharmacy Monitoring Agency inspector, police officers, religious leaders, family members and friends) was identified during our qualitative study among pharmacists and pharmacy students (Ibragimov, in progress-a). Both normative beliefs and motivation to comply sub-constructs were measured on a 5-point '*strongly disagree*' (-2) – *'strongly agree'* (2) Likert scale. To derive the

composite perceived norms value, we multiplied every normative belief value by the relevant motivation to comply value as recommended by TPB authors (Montano & Kasprzyk, 2008). The higher scores relate to more positive perceived norms about providing syringes to PWID.

The *self-efficacy* scale for providing syringes to PWID consists of two sub-scales – *perceived barriers* and *facilitating factors* related to providing syringes and relevant *control beliefs* (perceived ability to control these factors). *Potential barriers* included six items on the form, *'[An external factor] will make it easy or difficult to provide syringes to PWID'.* Barriers and facilitating factors (i.e. Pharmacy Monitoring Service, police, policies regulating syringe sale, owner or staff, salary supplement and workload) were elicited during the qualitative stage. The five-point response scale ranged from *'very difficult'* (-2) to *'very easy'* (+2). Accordingly, c*ontrol beliefs* items were formulated as follows: *"If [a barrier] would interfere with provision of syringes to PWID, can you address this on your own?'* We did not ask pharmacists about their control beliefs over salary supplement or syringe sale policies, assuming that these factors are not within their control. This sub-scale was measured using a 5-point '*strongly disagree*' (-2) – *'strongly agree'* (+2) Likert scale. In addition, we included four items directly measuring self-efficacy (e.g. '*Selling syringes to PWID is completely under my control'* or *'Distributing syringes to PWID for free would be easy for me')* on a 5-point '*strongly disagree*' (-2) – *'strongly agree'* (2) Likert scale. Then we multiplied the value for *potential barrier/facilitator* by the value of *control belief* for each external factor (items related to salary and policies were multiplied by two to ensure the similar range) as recommended by TPB. Higher composite scores correspond to higher self-efficacy.

The stigma towards PWID scale is based on the scale proposed by Palamar et al. (2011). The original scale consisted of 7 items (for example, "*Heroin users are weak minded*") measured

on a 5-point Likert scale ranging from '*strongly disagree*' (1) to '*strongly agree'* (5). We modified the scale by adding 6 more items based on themes (e.g. drug use being sin, PWID harming families and society) that emerged from the individual interviews conducted among pharmacists and pharmacy students in Tajikistan (see Results section). An example of an item is "*Heroin users harm their families*". Higher scores equate stronger stigmatization of PWID.

We revised a 13-item *Social conservatism* scale by Henningham (1996) measuring agreement with liberal or conservative values by removing 6 items not relevant to the context of Tajikistan (e.g. '*Asian immigration' or 'Bible truth'*) and replacing them with more relevant items such as '*Hijab for all wome*n' or '*Condom education for high schoolers'*. We also added two items measuring religiosity (e.g. *'Religion is very important for me'*) and changed the response options from '*yes/no'* to a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert scale to increase variance in data. Higher score indicates more conservative values.

The *drug use controllability* scale proposed by Brener and Von Hippel (2008) consists of four items (e.g. '*PWID can stop using drugs whenever they want to'*) with a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert scale. Higher scores relate to stronger belief in controllability of drug use.

The *exposure to drug users index* (Palamar et al., 2011) assessed participants' encounters with heroin users in various settings and situations (e.g. school, family, work). An example of an item is '*I have lived with a person who uses heroin*' with response options 'yes' (1), 'no' (0) and 'not sure' (0). We also added two questions measuring pharmacists' perceptions of pervasiveness of injecting drug use in the city (e.g. '*There are a lot of PWID in my city'*) measured on a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert scale (values of these two items were

divided by five to maintain the original range). Higher index scores indicate higher perceived exposure to PWID.

The *HIV and drug dependency knowledge index* was derived from the HIV-KQ-18 measure (Carey & Schroder, 2002) assessing knowledge of basic facts related to HIV transmission (a typical item: '*A person can get HIV by sharing a glass of water with someone who has HIV'*) with 'yes', 'no' or 'don't know' response options with each correct answer resulting in one score summed into the total index score. We excluded three items that were perceived either as too explicit (e.g. a question about oral sex) or irrelevant to Tajikistan's context (a question about natural skin condom) during the pre-test. We added two questions about the possibility of HIV transmission via used syringes (e.g. '*Washing syringes in bleach can reduce the risk of HIV infection'*) and an item about the possibility of transmitting HIV via saliva, a common misconception. We also included two items about drugs used for medication assisted treatment (Methadone) and reversal of opiate overdose (Naloxone) to assess *knowledge about drug-related* issues, where participants were asked to select the right answer out of five. Higher index scores reflect higher knowledge level.

We also measured basic demographic characteristics (age, gender, city, marital status) as well as the level of education (five-year university vs. two-year college) and work experience in years.

Analysis

We conducted descriptive analyses of survey and purchase data. Analyses of missing data indicated that missingness for sociodemographic covariates ranged from 0% (city) to 10.3% (years lived in the city). For some composite measures the percentage of missing values was quite high, reaching 24.6% for perceived norms and 26.3% for social conservatism score.

However, for the re-specified measures that were part of the final model, missingness was lower – 19.8% for social conservatism scale (7 items), 5.2% for attitudes towards providing syringes and lower for other scales. Further, of those who agreed to participate, 11 pharmacists (4.7%) requested to delink syringe purchase audit results from survey data. In the final model 10.3% (n=24) data patterns were missing. We used maximum likelihood (ML) and robust weighted least squares with mean and variance adjustment (WLSMV) estimation algorithms able to produce consistent estimates with missing data assuming missing at random mechanism (Asparouhov & Muthén, 2010; Baraldi & Enders, 2010).

We recoded negatively worded items, calculated mean scores for each composite measure and treated them as continuous variables for bivariate analysis. Univariate analyses produced descriptive statistics characterizing measures of central tendency (mean) and spread (standard deviation) for continuous variables and frequency and count for dichotomous ones. Distribution of responses for each composite measure was analyzed using histograms as well as skew and kurtosis. Since all response options were predetermined, no outliers were expected to occur.

Basic psychometric characteristics of the scales were explored. Inter-item reliability was assessed by calculating Cronbach's alpha. Scales with an alpha statistic <0.70 were considered for modification, where possible. All statistical analyses used 5% significance level; effect sizes and confidence intervals were reported for all statistical tests.

Validity analysis. Construct validity of the scales was explored by identifying their factor loadings of the scales in the sample of pharmacy students (see Chapter 4)(Ibragimov, in progress-b) using *exploratory factor analysis* (EFA). For the scales with composition of items different from that of students (modified stigma scale with drug controllability items, perceived

norms and self-efficacy) we conducted EFA using data from the pharmacists' sample. We used maximum likelihood (ML) method to extract latent factors, since this method is better suited for inferring the results from the sample to larger population and provides both standard errors for the model parameters and goodness of fit statistics (Bandalos & Finney, 2010). The final decision on the number of factors to retain was made by comparing the results of different methods such as Velicer's Minimum Average Partial procedure (Velicer, 1976), eigenvalues greater than 1, scree-plot and weighing in theoretical considerations. Taking into account the high possibility of correlation between the factors, we used the oblique rotation method (*promax*). Given the exploratory character of the study, we retained several competing models (factor solutions and related items) for the scales to compare them during the CFA stage. We excluded items with low item loadings (below 0.4) and tested convergent and discriminant properties of the modified scales using Pearson's correlation test. We also assessed association between the modified scales and dichotomous variables (main outcome and demographics) as well as between dichotomous variables using simple logistic regression.

Identified latent factor structure was confirmed using *confirmatory factor analysis* (CFA) of data from the pharmacists' sample, as described below. A priori models related to each scale were specified based on factors and items belonging to each factor identified during the EFA stage. Models were estimated each time a change had been made. Model fit was assessed using the following indicators: (a) chi-square test, where non-significant test at alpha=0.05 indicates good fit; (b) RMSEA index with the value above 0.08 indicating poor fit; (c) comparative fit index (CFI) with values of 0.95 and more suggesting good fit (Bandalos & Finney, 2010). If no model demonstrated good fit, we re-specified the models based on modification indices (although model re-specification is discouraged in CFA by some authors, since its main purpose

is testing the fit of a priori models and understanding the underlying structure of the scale variables, our decision can be justified by the exploratory nature of the study). Each modification was added one at a time, the resulting model was estimated anew and goodness of fit statistics and model parameters were obtained for each modification.

Structural Equation Modelling (SEM). In the final step, we tested the structural model of the relationships among the latent factors, the outcome (syringe purchase audit results) and control variables. Since the outcome was dichotomous, we applied robust weighted least squares with mean and variance adjustment (WLSMV) estimation algorithm able to handle non-normal data and produce consistent estimates with missing data (Asparouhov & Muthén, 2010). In order to address the problems with convergence of the initial model we assessed the output to detect potential reasons such as improper values (negative error variances, factor correlations greater than one, very large coefficient values) and excluded variables causing these problems from the model. Re-specification also involved merging scales to address multicollinearity that prevented model convergence. Specifically, because of the high correlation between drug controllability and stigma scale items, we loaded items of both scales together into a single factor. This approach can be justified by the fact that drug controllability address stereotypes related to PWID – an integral component of stigma (Link & Phelan, 2001).

When model convergence was achieved, we tested the model's goodness of fit. We tested alternative models with different number of factors (e.g. with two factor loadings for stigma scale and two and three factor loadings for self-efficacy scale) as suggested by the EFA results. To ensure adequate goodness of fit we iteratively re-specified the models by adding covariances between the indicators of the same factors based on the modification indices. Further, we

excluded indicators with low factor loadings and removed some of the latent factors that had low reliability or factor-item correlation.

We did not report parameter estimates for the models with improper fit. For the model with adequate fit, we report unstandardized and fully standardized path coefficients, standard errors for unstandardized path coefficients and significance test results (p-values). Standardized coefficients for unidimensional variables were squared to derive variance (R^2) of this variable explained by the factor it pertains. Factor quality was assessed based on the magnitude of factor-item correlation expecting that majority of items would have R^2 greater than 0.5.

All statistical analyses prior to structural equation modeling (SEM) were performed in STATA 14.0 software (StataCorp LP, College Station, TX). SEM was performed on Mplus 7.4 (Muthen & Muthen).

Results

Sociodemographic characteristics of the participants and syringe purchase audit results are presented in Table 2.1. Out of 232 pharmacists who participated in the survey 204 (87.9%) agreed to sell syringes without prescription during the syringe purchase audit. Overall, most participants were male (63.8%) and the sample was relatively young (with mean age=33.2, SD = 9.3). Pharmacy owners or those with the university diploma comprised a minority (21.1% and 28.9% respectively) of participants. Factor loadings of the scale items as well as uniqueness (an inverse of commonality) of each item are given in the Tables 2.2 and 3.2. Each scale entered into the final model loaded on one latent factor.

Descriptive statistics of scales and indices (from the original and final models) are presented in Table 2.3. Most scales included into the final model have good or adequate inter-

item reliability (i.e., >0.70). However, the final behavioral intent measure had a Cronbach's alpha of 0.65; the low inter-item reliability of this measure can be partially due to the fact that there were only two items in the final scale.

Bivariate analysis demonstrated significant association between most of the scales (Table 2.4) with correlation coefficients being medium to small (r=0.15 to 0.48), suggesting that these scales reflect similar, though different concepts. At the same time, high correlation between the drug controllability and stigma scales (r=0.78, p<0.001) indicated high convergence between these measures. Taking into account this finding and multicollinearity of some items from these two scales found at SEM stage we decided to merge these two scales into one in the final model.

We found statistically significant associations among several key constructs (i.e. drug controllability beliefs, HIV knowledge, stigma, attitudes towards providing syringes and behavioral intent to provide syringes) and the results of syringe purchase audit as well as some sociodemographic characteristics (Table 2.5). Those who agreed to sell syringes were more likely to be from Dushanbe (OR 2.92; 95%CI 1.30, 6.54), have lower drug controllability beliefs (OR 0.71; 95%CI 0.56; 0.90), higher HIV and drug dependency knowledge (OR 1.18; 95%CI 1.04, 1.35), lower level of stigma (OR 0.84; 95%CI 0.74, 0.93), more positive attitudes towards provision of syringes (OR 1.09; 95%CI 1.04, 1.15) and more willingness to provide syringes to PWID (OR 1.26; 95%CI 1.08, 1.48).

The diagram of the final SEM results is presented in Figures 2.1 (structural model) and 2.2 (measurement model). The model demonstrated adequate fit with χ^2 =221.7 (df=191, p=0.06), RMSEA= 0.03 and CFI =0.96. According to the model testing results (Table 4), the positive outcome of the syringe purchase audit was significantly and positively associated with the behavioral intent to provide syringes (β=0.36, p<0.001) and social conservatism (β=0.35,

p=0.02), and inversely with stigma (β=-0.43, p=0.01). Intent to provide syringes significantly and positively correlated with attitudes (or, more specifically, its behavioral beliefs component) towards provision of syringes to PWID (β=0.35, p=0.008), while attitudes were negatively associated with stigma (β=-0.54, p<0.001) and positively with age (β=0.20. p=0.03). The model also demonstrated statistically significant and positive correlation between stigma and social conservatism (β=0.47, p<0.001) and negative association with university education (β=-0.28, p<0.001). The model explained about a third of stigma factor variance (R^2 =0.35), although for other dependent latent factors this estimate was lower (Table 2.6). Factor-item correlation was adequate for the stigma latent variable only, where most of items showed R^2 greater than 0.5, while factor validity for other latent variables was limited (Table 2.7).

Discussion

This study tested the theory-based structural model explaining pharmacists' practices related to providing syringes to PWID in Tajikistan using a syringe purchase audit as the main outcome. The high percentage of sampled pharmacists who agreed to sell syringes shows that the absence of clear policies regulating syringe sales does not prevent pharmacists from selling syringes over-the-counter. Our findings are in line with the accounts of PWID reporting purchasing syringes in pharmacies in Tajikistan (Otiashvili et al., 2016). At the same time, our findings do not indicate absence of any barriers towards obtaining syringes by PWID. Other factors, such as lack money to buy syringes or police surveillance, may reduce accessibility of syringes to PWID in pharmacies (Ibragimov, Latypov, Jamolov, & Khasanova, 2011; Otiashvili et al., 2016).

The study helped reveal several factors associated with the practice of selling syringes over-the-counter. Specifically, the linkages found here among practice, behavioral intent and attitudes towards providing syringes support the key theoretical postulates of TPB/IBM (Montano & Kasprzyk, 2008). Furthermore, the model demonstrates that attitudinal factors, such as stigma and behavioral beliefs about outcomes of syringe sale, are important correlates of actual syringe sale practices. While previous studies assessed factors explaining pharmacists' self-reported syringe sale practices or willingness to provide syringes (Matheson, Bond, & Tinelli, 2007; Rich et al., 2002; Scott & Mackridge, 2009; Taussig et al., 2002); our study is the first to demonstrate the link between pharmacists' attitudinal and background factors and their actual syringe sale practices.

The model highlighted the central role of stigma against PWID. Thus, stigma may influence pharmacists' behavior indirectly by triggering negative attitudes towards the idea of providing syringes to PWID (or, given the item composition of the attitude scale, negative beliefs about the outcomes of such behavior), which in turn reduces their intent to provide syringes. The direct inverse link between stigma and syringe selling practice remained significant while controlling for the association between these two variables mediated by the attitudes and behavioral intent. This finding suggests that pharmacists who stigmatize PWID may refuse to sell syringes even if they have no negative beliefs regarding the outcomes of selling syringes to PWID. However, we cannot relate this assumption to previous studies of pharmacists' attitudes since they either did not assess the role of stigma in addition to attitudes towards providing syringes (see, e.g. Rich et al., 2002) or measured both concepts with one instrument (see, e.g. Matheson et al., 1999).

The positive correlation between stigma and social conservatism found in our study corresponds with the literature on stigmatization of PWID. In particular, a study among Australian health care providers showed that social conservatism may predict stigmatization of PWID and this link has been mediated by perceived drug use controllability (Brener et al., 2010), a component of the stigma scale used in our study. The results of our qualitative exploration of Tajikistani pharmacists' attitudes towards PWID in Tajikistan also showed that socially conservative values may be an important contextual antecedent of stigma (Chapter 2).

The direct positive link between social conservatism and agreeing to sell syringes (while controlling the pathway between both variables mediated by stigma) is puzzling. Notably, the non-significant bivariate association between social conservatism and syringe sale practices suggest that there may be little or no relationship between these variables. An alternative explanation for this relationship might be that socially conservative pharmacists who hold little or no stigma against PWID may choose to sell syringes based on pragmatic reasons (e.g. selling syringe as business). Although we did not address pragmatism as a construct of our model, qualitative findings indicate that this proposition is plausible (see Chapter 2).

Attitude-related factors may depend on sociodemographic factors, as shown by the model. Older pharmacists tend to be more stigmatizing towards PWID and at the same time demonstrate more positive beliefs in the outcomes of providing syringes. A potential explanation might be that older pharmacists may have a more realistic understanding of the positive outcomes of syringe provision due to higher professional or personal exposure to PWID (Matheson et al., 2007; Scott & Mackridge, 2009). Lower levels of stigma among pharmacists with a university education as compared to those with vocational school diploma might be due to their better understanding of drug dependency and HIV-related issues, as shown in studies

conducted outside of Tajikistan (Ding et al., 2005; Scott & Mackridge, 2009); however, we cannot test this hypothesis since the model with the knowledge index had poor measurement properties.

Our findings support the key theoretical proposition of IBM related to the linkage between attitudinal factors, behavioral intent, and actual behavior. Although we were not able to test the role of such theory-based constructs as perceived norms and self-efficacy, our results suggest that IBM is applicable to studying pharmacists' behavior related to providing syringes to PWID.

Practical implications

The role of stigma against PWID and attitudes (behavioral beliefs) in influencing syringe sale practices highlight the need for educational and advocacy activities directed toward pharmacists. Although the results of the syringe purchase audit were positive in the majority of pharmacies, PWID may still face obstacles while accessing syringes in the pharmacies, as reported by Otiashvili et al. (2016). While we were unable to test to what extent knowledge of HIV and drug-related issues may influence pharmacists' decisions, global literature demonstrates a positive influence of education and training on improving service providers' attitudes towards PWID and other marginalized populations (Andrewin & Chien, 2008; Balfour et al., 2010; Ding et al., 2005; Feyissa, Abebe, Girma, & Woldie, 2012; Waluyo, Culbert, Levy, & Norr, 2014). Training should also be accompanied by support from supervisors and colleagues, as demonstrated by the study among nurses in Australia (Ford, Bammer, & Becker, 2009). Conservative social values affecting willingness to provide syringes can be potentially counterweighed by emphasis on the practical advantages of harm reduction. Future studies should involve developing and testing thr efficacy of educational and stigma-reducing

interventions targeting pharmacists in Tajikistan as knowledge in this area is limited. Evaluation of syringe promotion interventions may require studies assessing the link between geospatial distribution of HIV risk among PWID, their access to sterile syringes and pharmacists' attitudes and practices related to selling syringes.

Strengths and limitations

Our study featured several strengths, including the use of a syringe purchase audit to assess actual syringe sale practices; probability-based sampling of pharmacies; and administering the survey via CASI to reduce social desirability bias. Use of measures that were not previously validated in Central Asia and limited sample size might have impacted assessment of the model, resulting in exclusion of important theoretical constructs (e.g. HIV and drug-related knowledge, self-efficacy). Due to the cross-sectional nature of the study, we cannot establish temporality of the associations or identify cause-effect relationships within the model. The validity of the syringe purchase audit may also be limited because it was not conducted by actual PWID. The study results may also have limited generalizability to rural areas of Tajikistan.

Conclusion

This is the first quantitative study of factors predicting pharmacists' attitudes and practices towards providing syringes to PWID in Tajikistan. We demonstrated the availability of syringes over-the-counter in urban pharmacies and emphasized the role of stigma in shaping pharmacists' attitudes and willingness to provide syringes to PWID. Education and advocacy activities targeting pharmacists are needed to reduce stigmatization of PWID and ensure their wide access to clean needles and syringes as part of the national HIV and HCV response.

Tables

Table 2.1. Sociodemographic characteristics of pharmacists surveyed in Dushanbe and Kulob cities of Tajikistan (n=232)

Variable	Mean	SD	Missing, n (%)
Age, years	33.2	9.3	18 (7.8)
Experience as pharmacist, years	7.2	6.0	11 (4.7)
Years lived in the city	17.8	6.0	24 (10.3)
	Frequency, %	**Count, n**	
Female	36.2	84	1 (0.4)
Dushanbe (vs. Kulob)	71.6	166	0
Owner (vs. employee)	21.1	49	2 (0.9)
University (vs. technical college)	28.9	67	11 (4.7)
Marital status			4 (1.7)
Single	21.6	50	
Married	64.2	149	
Widowed, divorced, separated	12.5	29	

Table 2.2 Results of exploratory factor analysis (promax rotation) of the select measures for Tajikistani pharmacists' sample (n=232)

Scales and items	Factor loading	Uniqueness
Stigma (including drug controllability items)		
People who inject drugs are to blame for their addiction	0.787	0.381
People use drug because of character weakness	0.755	0.431
Heroin users (HU) have no future	0.735	0.460
HU are bad parents	0.712	0.493
HU harm society	0.710	0.496
HU harm families	0.688	0.527
I sympathize with HU*	0.670	0.551
All HU should go to prison	0.659	0.566
I treat HU as others*	0.655	0.571
All HU have no integrity	0.628	0.606
HU deserve healthy long lives	0.587	0.656
Heroin use is a sin	0.546	0.702
Heroin makes a person crazy	0.540	0.708
Marrying someone from an HU family is OK*	0.488	0.762
People who inject drugs have no willpower	0.469	0.780
A person can stop injecting drugs if they want to	-0.082	0.993
Alcohol makes a person more aggressive than heroin*	-0.219	0.952
Perceived norms scale		
Pharmacists I know	0.672	0.549
Family members	0.663	0.560
Religious leaders	0.640	0.591
Friends	0.607	0.631
Pharm monitoring agency	0.594	0.647
Police	0.527	0.722
Owner/staff	0.375	0.859
Self-efficacy scale		
Pharmacy monitoring service makes syringe distribution hard/easy	0.776	0.398
Police makes syringe distribution hard/easy	0.672	0.548
Owners/staff make syringe distribution hard/easy	0.484	0.766
Lack of time makes syringe distribution hard/easy	0.263	0.931
Free distribution of syringes depends on me	-0.194	0.962
Selling syringes to PWID depends on me	-0.204	0.958
Salary supplement will make syringe distribution easier	-0.330	0.891
Selling syringes to PWID is easy	-0.367	0.865
Free distribution of syringes to PWID is easy	-0.460	0.788
Current policies	-0.591	0.651

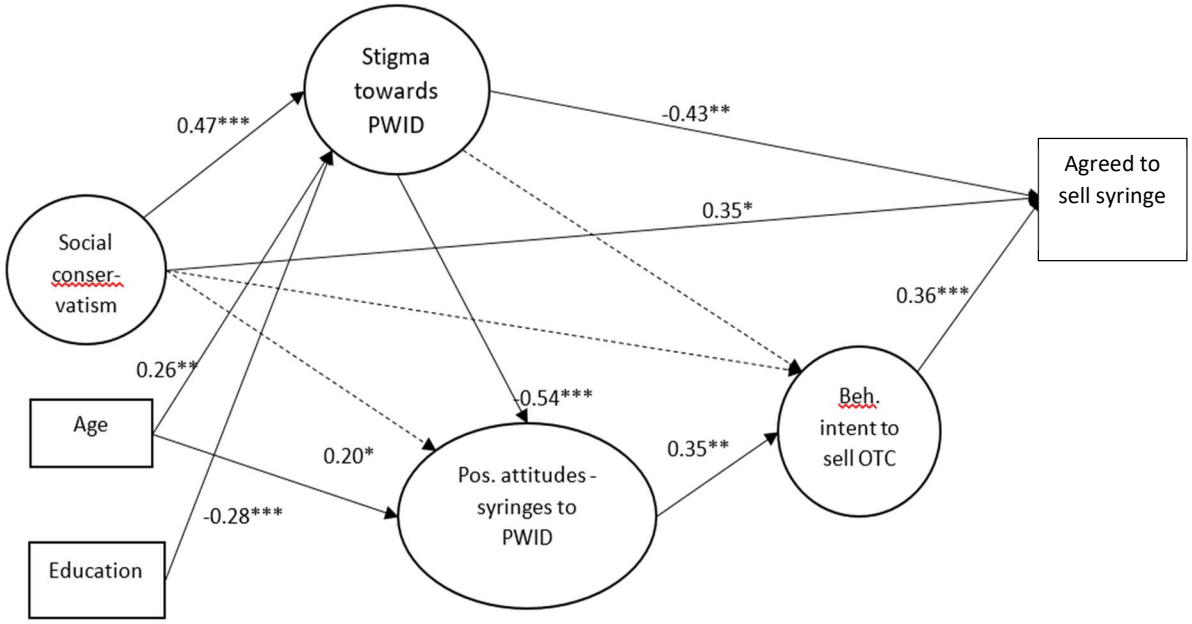
*Reverse coded items. Items included to the final model are in bold font. See Table 3.2 for other scales

Table 2.3 Descriptive statistics of composite measures for Tajikistani pharmacists (n=232)

Scale/Index	N=232	Missing (%)	Mean	Std. Dev.	**Reliability** (Cronbach's alpha or Kuder-Richardson's 20)
Stigma (17 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – stronger stigma)	208	10.3	3.70	0.62	0.88
Stigma (6 final model items)*	224	3.5	4.21	0.79	0.88
Social conservatism (14 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – more conservative)	171	26.3	3.73	0.50	0.70
Social conservatism (7 final model items)	186	19.8	3.94	0.66	0.73
Attitudes towards providing syringes (13 items response options: *Str. disagree* '0' to *Str. agree* '5', higher – more positive)	208	10.3	2.28	0.72	0.88
Attitudes towards providing syringes (4 final model items)	220	5.2	2.04	0.81	0.73
Behavioral intent (3 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – more willing)	220	5.2	3.38	0.88	0.74
Behavioral intent (2 final model items)	223	3.9	3.71	0.93	0.63
HIV and harm reduction knowledge index (15 items, response options: *True*, *False*, *Don't Know*, higher – better knowledge)	195	16.0	0.65	0.21	0.74
Personal exposure to heroin users index (9 items *Yes* '1', *No* '0', *Not Sure* '0', higher – more exposure)	214	7.8	0.36	0.24	0.73
Perceived norms (7 items, normative beliefs x motivation to comply; response options: *Str. disagree* '-2' to *Str. agree* '+2', higher – more positive perceived norms)	175	24.6	-0.23	1.26	0.76
Self-efficacy (10 items): direct measure (4 items, *Str. disagree* '-2' to *Str. agree* '+2') + indirect measure (6 items, perceived barriers [*'very difficult'* '-2' to *'very easy'* '+2'] x [control belief, *Str. disagree* '-2' to *Str. agree* '+2'], higher – more self-efficacious)	177	23.7	0.12	0.64	0.65

* Scales from the final model are in bold font

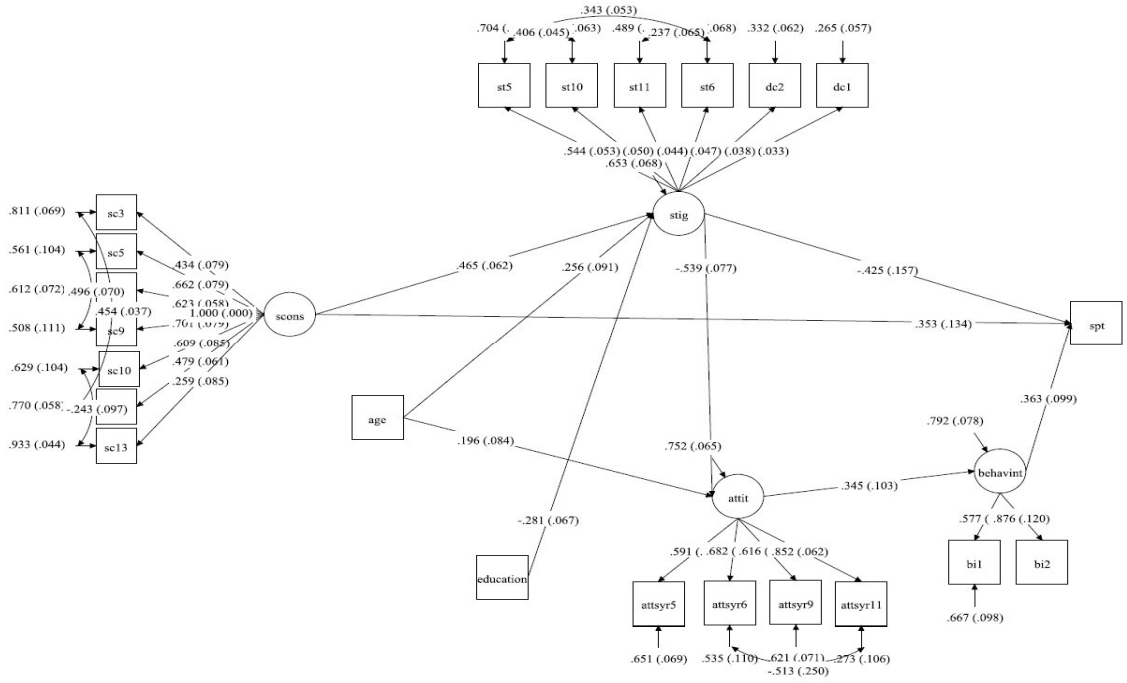
Figure 2.1. Final structural model of Tajikistani pharmacists' syringe sale practices



* p<0.05, ** p<0.01, *** p<0.001

Note: Only standardized estimates are shown. Solid arrows denote associations between the constructs significant at α=0.05; dotted arrows show associations non-significant at α=0.05. Circles refer to the latent constructs, boxes – to directly measured items.

Figure 2.2. Final measurement model of Tajikistani pharmacists' syringe sale practices



Note: Significant (at α=0.05) standardized estimates and standard errors (in parenthesis) are shown. Circles refer to the latent constructs, boxes to directly measured items. Construct names: 'scons' – social conservatism; 'stig' – stigma against PWID; 'attit' – attitudes related to provision of syringes to PWID; 'behavint' – intent to sell syringes without prescription; 'spt' – agreeing to sell syringes in syringe purchase audit. For the names of individual items see Table 2.8

Table 2.4. Bivariate correlation of key continuous variables for Tajikistani pharmacists (n=232)

	Age, years	Pharm experience	Social conser-vatism	Drug control-lability beliefs	HIV and drug knowledge score	Personal encounters with PWID	Stigma-tization of PWID	Attitudes towards providing syringes to PWID	Self-efficacy	Subjec-tive norms
Pharmacy experience in years	**0.73*** **	1.00								
Social conservatism score (higher - more conservative)	0.06	0.04	1.00							
Drug controllability beliefs (higher - stronger)	**0.19****	0.06	**0.48*** **	1.00						
HIV and drug knowledge score Higher - better (Higher - more likely)	-0.05	0.00	**-0.27****	**-0.27*** **	1.00					
Personal encounters with PWID (Higher - more frequent)	**0.21****	0.08	0.05	**0.18**	**-0.17**	1.00				
Stigmatization of PWID (Higher - stronger stigma)	**0.29*** **	0.11	**0.41*** **	**0.78*** **	**-0.31*** **	**0.31*** **	1.00			
Attitudes towards providing syringes to PWID (Higher - more favorable)	0.00	0.00	**-0.26*** **	**-0.44*** **	**0.26*** **	0.08	**-0.38*** **	1.00		
Self-efficacy (Higher - more self-efficacious)	-0.10	-0.14	-0.14	-0.14	0.08	0.13	-0.14	0.08	1.00	
Subjective norms (Higher - stronger beliefs in referent persons' positive attitudes re providing syringes to PWID)	-0.09	0.10	**-0.26****	**-0.25****	**0.25****	**-0.25****	**-0.24****	0.08	0.07	1.00
Behavioral intent to provide syringes	-0.03	-0.05	**-0.29*** **	**-0.37*** **	**0.27*** **	-0.07	**-0.31*** **	**0.33*** **	**0.29*** **	**0.15***

* p<0.05, ** p<0.01, *** p<0.0

Table 2.5. Bivariate association between binary and continuous variables for Tajikistani pharmacists (n=232)

	Dushanbe-city (vs. Kulob)	Female	University (vs. tech. college)	Married	Pharmacy owner	Syringe purchase audit (agreed to sell)
	Odds Ratio					
Dushanbe city (vs. Kulob)						**2.92****
Pharmacy experience in years	ns	ns	ns	ns	ns	ns
Social conservatism score (higher - more conservative)	ns	ns	ns	ns	ns	ns
Drug controllability beliefs (higher - stronger)	**0.83***	ns	**0.79*****	ns	ns	**0.71****
HIV and drug knowledge score Higher – better	**1.24*****	ns	**1.29*****	ns	ns	**1.18***
Personal encounters with PWID (Higher - more frequent)	**0.61*****	**0.77*****	ns	ns	ns	ns
Stigmatization of PWID (Higher - stronger stigma)	**0.85*****	ns	**0.92*****	ns	ns	**0.84****
Attitudes towards providing syringes to PWID (Higher - more favorable)	ns	ns	ns	ns	ns	**1.09****
Self-efficacy (Higher - more self-efficacious)	**1.09****	ns	ns	ns	ns	ns
Subjective norms (Higher - stronger beliefs in referent persons' positive attitudes re providing syringes to PWID)	**1.04***	ns	**1.05****	ns	ns	ns
Behavioral intent to provide syringes (Higher - more likely)	**1.17****	ns	ns	ns	ns	**1.26****

* p<0.05, ** p<0.01, *** p<0.001, ns – not significant

Table 2.6. Results of testing the final model of Tajikistani pharmacists' syringe sale practices – factor loadings, covariates and explained variance of latent factors

Latent factors and indicators	Standar-dized coeff. (STDYX)	Unstan-dardized coeff.	Standard error (SE) for unstan-dardized coeff.	Unstan-dardized coeff./SE	p-value
Behavioral intent					
Willing to sell syringes over-the-counter to PWID	0.58	1.00	0.00	n/a	n/a
Willing to sell syringes over-the-counter to any person	0.88	1.78	0.51	3.49	**<0.001**
Attitudes (behavioral beliefs) towards providing syringes					
Will cause problems with state controllers	0.59	1.00	0.00	n/a	n/a
Will encourage drug use	0.68	1.35	0.28	4.84	**<0.001**
Will impact safety of staff	0.62	0.92	0.15	6.14	**<0.001**
Will result in theft in the pharmacy	0.85	1.63	0.30	5.45	**<0.001**
Stigma towards PWID					
People who inject drugs are to blame for their addiction	0.86	1.00	0.00	n/a	n/a
People use drugs because of character weakness	0.82	0.92	0.10	9.39	**<0.001**
Heroin users (HU) have no future	0.73	0.99	0.13	7.95	**<0.001**
HU are bad parents	0.72	0.86	0.11	8.12	**<0.001**
HU harm society	0.63	0.66	0.10	7.01	**<0.001**
HU harm families	0.54	0.50	0.07	6.84	**<0.001**
Social conservatism scale					
I am very religious	0.43	1.00	0.00	n/a	n/a
Penalty for same-sex sex	0.66	2.40	0.66	3.61	**<0.001**
Youth to obey seniors	0.62	1.50	0.32	4.66	**<0.001**
Penalty for sex work	0.70	2.35	0.68	3.48	**<0.001**
Arranged marriage	0.61	2.57	0.71	3.62	**<0.001**
Religion is important for me	0.48	1.11	0.20	5.72	**<0.001**
Hijab for all women	0.26	0.97	0.40	2.43	**0.015**
Association between the latent factors					
Stigma on age	0.26	0.02	0.01	2.65	**0.008**
Stigma on university education	-0.28	-0.54	0.14	-3.88	**<0.001**
Stigma on social conservatism	0.47	1.23	0.30	4.14	**<0.001**
Attitudes on age	0.20	0.01	0.01	2.17	**0.030**
Attitudes on stigma	-0.54	-0.38	0.09	-4.49	**<0.001**
Attitudes on social conservatism	0.08	0.14	0.17	0.82	0.413
Behavioral intent on social conservatism	-0.17	-0.29	0.20	-1.49	0.136
Behavioral intent on attitudes	0.35	0.32	0.12	2.65	**0.008**

Latent factors and indicators	Standar-dized coeff. (STDYX)	Unstan-dardized coeff.	Standard error (SE) for unstan-dardized coeff.	Unstan-dardized coeff./SE	p-value
Behavioral intent on stigma	-0.07	-0.05	0.08	-0.62	0.536
Syringe purchase audit (SPT) on behavioral intent	0.36	0.65	0.19	3.51	**<0.001**
SPT on stigma	-0.43	-0.49	0.19	-2.55	**0.011**
SPT on attitudes	0.04	0.07	0.18	0.40	0.691
SPT on social conservatism	0.35	1.09	0.48	2.28	**0.023**
Covariates					
'Penalty for sex work' (sc9) with 'penalty for same-sex sex' (sc5)	0.50	0.35	0.10	3.60	**<0.001**
'Religion is important for me' (sc11) with 'I am very religious' (sc3)	0.45	0.21	0.03	6.83	**<0.001**
'Hijab for all women' (sc13) with 'Arranged marriage' (sc10)	-0.24	-0.32	0.13	-2.38	**0.017**
'Will result in theft in the pharmacy' (attsyr11) with 'will encourage drug use' (attsyr6)	-0.51	-0.28	0.10	-2.87	**0.004**
'Heroin users (HU) harm society' (st10) with 'HU harm families' (st5)	0.41	0.19	0.03	5.73	**<0.001**
'HU have no future' (st6) with 'HU harm families' (st5)	0.34	0.19	0.04	4.46	**<0.001**
'HU are bad parents' (st11) with 'HU have no future' (st6)	0.24	0.14	0.05	2.89	**0.004**
Proportion of variance explained (R^2) for dependent latent factors	**Two-Tailed Estimate**		**Est./S.E.**	**p-value**	
Behavioral intent	0.21		2.64	**0.008**	
Attitudes	0.25		3.80	**<0.001**	
Stigma	0.35		5.09	**<0.001**	

Table 2.7. Proportion of variance explained (R^2) of observed variables for Tajikistani pharmacists sample (n=232)

Variables	Two-Tailed Estimate	S.E.	Est./S.E.	P-Value	Residual Variance
Attitude items					
Will cause problems with state controllers	0.349	0.069	5.074	<0.001	
Will encourage drug use	0.465	0.11	4.246	<0.001	
Will impact safety of staff	0.379	0.071	5.366	<0.001	
Will result in theft in the pharmacy	0.727	0.106	6.831	<0.001	
Behavioral intent items					
Intent to sell syringes over-the-counter to PWID	0.333	0.098	3.418	0.001	
Intent to sell syringes over-the-counter to any person	0.768	0.21	3.649	<0.001	
Stigma items					
People who inject drugs are to blame for their addiction	0.735	0.057	12.985	<0.001	
People use drugs because of character weakness	0.668	0.062	10.73	<0.001	
Heroin users (HU) have no future	0.537	0.068	7.87	<0.001	
HU are bad parents	0.511	0.063	8.042	<0.001	
HU harm society	0.398	0.063	6.307	<0.001	
HU harm families	0.296	0.057	5.158	<0.001	
Social conservatism items					
I am very religious	0.189	0.069	2.738	0.006	
Penalty for same-sex sex	0.439	0.104	4.218	<0.001	
Youth to obey seniors	0.388	0.072	5.41	<0.001	
Penalty for sex work	0.492	0.111	4.436	<0.001	
Arranged marriage	0.371	0.104	3.576	<0.001	
Religion is important for me	0.23	0.058	3.933	<0.001	
Hijab for all women	0.067	0.044	1.519	0.129	
Syringe purchase audit	0.352	0.125	2.83	0.005	0.669

Table 2.8. Additional results of the final model testing of Tajikistani pharmacists' syringe sale practices

Intercepts	Unstan-dardized coeff.	Standar-dized coeff. (STDYX)	Standard error (SE) for unstan-dardized coeff.	Unstan-dardized coeff./SE	p-value
Will cause problems with state controllers (attsyr5)	1.73	1.655	0.288	6.009	<0.001
Will encourage drug use (attsyr6)	1.776	1.452	0.333	5.34	<0.001
Will impact safety of staff (attsyr9)	1.911	2.077	0.267	7.16	<0.001
Will result in theft in the pharmacy (attsyr11)	2.243	1.899	0.374	5.998	<0.001
Willing to sell syringes to PWID without prescription (bi2)	3.677	3.748	0.259	14.222	<0.001
Willing to sell syringes over-the-counter to any person (bi1)	3.485	3.034	0.291	11.956	<0.001
People who inject drugs are to blame for their addiction (dc1)	3.626	3.552	0.286	12.69	<0.001
People use drugs because of character weakness (dc2)	3.551	3.61	0.273	13.018	<0.001
Heroin users (HU) have no future (st6)	3.06	2.581	0.41	7.471	<0.001
HU are bad parents (st11)	3.623	3.425	0.371	9.761	<0.001
HU harm society (st10)	3.534	3.845	0.346	10.212	<0.001
HU harm families (st5)	4.089	5.116	0.265	15.437	<0.001
I am very religious (sc3)	3.919	5.162	0.225	17.399	<0.001
Penalty for same-sex sex (sc5)	3.877	3.251	0.335	11.586	<0.001
Youth to obey seniors (sc7)	3.985	5.016	0.246	16.228	<0.001
Penalty for sex work (sc9)	4.064	3.678	0.312	13.027	<0.001
Arranged marriage (sc10)	3.145	2.263	0.351	8.959	<0.001
Religion is important for me (sc11)	4.043	5.277	0.272	14.859	<0.001
Hijab for all women (sc13)	3.512	2.843	0.343	10.254	<0.001
Thresholds					
Syringe Purchase audit	-1.531	-1.507	0.44	-3.479	0.001
Variances					
Social Conservatism	0.109	1	0.042	2.576	0.01
Residual variances					
Will cause problems with state controllers	0.712	0.651	0.082	8.672	<0.001
Will encourage drug use	0.8	0.535	0.152	5.273	<0.001
Will impact safety of staff	0.525	0.621	0.059	8.86	<0.001
Will result in theft in the pharmacy	0.381	0.273	0.132	2.896	0.004
Intent to sell syringes over-the-counter to PWID	0.641	0.667	0.094	6.813	<0.001
Intent to sell syringes over-the-counter to any person	0.306	0.232	0.269	1.138	0.255
People who inject drugs are to blame for their addiction	0.276	0.265	0.043	6.401	<0.001
People use drugs because of character weakness	0.321	0.332	0.046	6.922	<0.001
Heroin users (HU) have no future	0.65	0.463	0.087	7.498	<0.001

HU are bad parents	0.548	0.489	0.057	9.569	<0.001
HU harm society	0.509	0.602	0.054	9.491	<0.001
HU harm families	0.45	0.704	0.047	9.579	<0.001
I am very religious	0.468	0.811	0.049	9.454	<0.001
Penalty for same-sex sex	0.799	0.561	0.137	5.844	<0.001
Youth to obey seniors	0.386	0.612	0.044	8.777	<0.001
Penalty for sex work	0.62	0.508	0.109	5.671	<0.001
Arranged marriage	1.216	0.629	0.214	5.69	<0.001
Religion is important for me	0.452	0.77	0.042	10.664	<0.001
Hijab for all women	1.424	0.933	0.212	6.731	<0.001
Latent variables					
Behavioral Intent	0.254	0.792	0.083	3.074	0.002
Attitudes	0.287	0.752	0.079	3.641	<0.001
Stigma	0.500	0.653	0.098	5.099	<0.001

References

Abdul-Quader, A. S., Feelemyer, J., Modi, S., Stein, E. S., Briceno, A., Semaan, S., . . . Des Jarlais, D. C. (2013). Effectiveness of structural-level needle/syringe programs to reduce HCV and HIV infection among people who inject drugs: a systematic review. *AIDS and Behavior, 17*(9), 2878-2892.

Abdullah, T., & Brown, T. L. (2011). Mental illness stigma and ethnocultural beliefs, values, and norms: An integrative review. *Clinical Psychology Review, 31*(6), 934-948. doi:http://dx.doi.org/10.1016/j.cpr.2011.05.003

Adebajo, S., Obianwu, O., Eluwa, G., Vu, L., Oginni, A., Tun, W., . . . Idogho, O. (2014). Comparison of Audio Computer Assisted Self-Interview and Face-To-Face Interview Methods in Eliciting HIV-Related Risks among Men Who Have Sex with Men and Men Who Inject Drugs in Nigeria. *PloS one, 9*(1), e81981.

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion, 2*(2), 113-133.

Amesty, S., Blaney, S., Crawford, N. D., Rivera, A. V., & Fuller, C. (2012). Pharmacy staff characteristics associated with support for pharmacy-based HIV-testing in pharmacies participating in the New York State Expanded Access Syringe Exchange Program. *Journal of the American Pharmacists Association: JAPhA, 52*(4), 472.

Andrewin, A., & Chien, L.-Y. (2008). Stigmatization of patients with HIV/AIDS among doctors and nurses in Belize. *AIDS patient care and STDs, 22*(11), 897-906.

Asparouhov, T., & Muthén, B. (2010). Weighted least squares estimation with missing data. *Mplus Technical Appendix*, 1-10.

Balabanova, Y., Coker, R., Atun, R. A., & Drobniewski, F. (2006). Stigma and HIV infection in Russia. *AIDS care, 18*(7), 846-852. doi:10.1080/09540120600643641

Balfour, L., Corace, K., Tasca, G. A., Best-Plummer, W., MacPherson, P. A., & Cameron, D. W. (2010). High HIV knowledge relates to low stigma in pharmacists and university health science students in Guyana, South America. *International Journal of Infectious Diseases, 14*(10), e881-e887.

Bandalos, D., & Finney, S. (2010). Factor analysis: Exploratory and confirmatory. In G. Hancock & R. O. Mueller (Eds.), *The reviewer's guide to quantitative methods in the social sciences* (pp. 93-114). New York, NY: Routledge.

Baraldi, A. N., & Enders, C. K. (2010). An introduction to modern missing data analyses. *Journal of School Psychology, 48*(1), 5-37.

Beardsley, K., & Latypov, A. (2012). *Policy Analysis and Advocacy Decision Model for HIV-Related Services: People Who Inject Drugs.* Retrieved from Washington, DC:

Boymatov, A. (2015, May 2, 2015). [Personal Communication].

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Brener, L., Hippel, W. V., Kippax, S., & Preacher, K. J. (2010). The role of physician and nurse attitudes in the health care of injecting drug users. *Substance use & misuse, 45*(7-8), 1007-1018.

Brener, L., & Von Hippel, W. (2008). Measuring attitudes toward injecting drug users and people with hepatitis C. *Substance use & misuse, 43*(3-4), 295-302.

Brener, L., von Hippel, W., & Kippax, S. (2007). Prejudice among health care workers toward injecting drug users with hepatitis C: does greater contact lead to less prejudice? *International Journal of Drug Policy, 18*(5), 381-387.

Buchanan, J., & Young, L. (2000). The war on drugs--a war on drug users? *Drugs; Education, Prevention and Policy, 7*(4), 409.

Capitanio, J. P., & Herek, G. M. (1999). AIDS-related stigma and attitudes toward injecting drug users among Black and White Americans. *American Behavioral Scientist, 42*(7), 1148-1161.

Carey, M. P., & Schroder, K. E. (2002). Development and psychometric evaluation of the brief HIV Knowledge Questionnaire. *AIDS education and prevention: official publication of the International Society for AIDS Education, 14*(2), 172.

Carpenter, S. (2000). Effects of cultural tightness and collectivism on self-concept and causal attributions. *Cross-cultural research, 34*(1), 38-56.

Chick, G. (1997). Cultural complexity: The concept and its measurement. *Cross-cultural research, 31*(4), 275-307.

Clay, R., Terrizzi, J. A., Jr., & Shook, N. J. (2012). Individual differences in the behavioral immune system and the emergence of cultural systems. *Social Psychology, 43*(4), 174-184. doi:10.1027/1864-9335/a000118

Coffin, P. O., Linas, B. P., Factor, S. H., & Vlahov, D. (2000). New York City pharmacists' attitudes toward sale of needles/syringes to injection drug users before implementation of law expanding syringe access. *Journal of Urban Health, 77*(4), 781-793.

Compton, W. M., Horton, J. C., Cottler, L. B., Booth, R., Leukefeld, C. G., Singer, M., . . . Staton, M. (2004). A multistate trial of pharmacy syringe purchase. *Journal of Urban Health, 81*(4), 661-670.

Des Jarlais, D. C., Paone, D., Milliken, J., Turner, C. F., Miller, H., Gribble, J., . . . Friedman, S. R. (1999). Audio-computer interviewing to measure risk behaviour for HIV among injecting drug users: a quasi-randomised trial. *The Lancet, 353*(9165), 1657-1661.

Ding, L., Landon, B. E., Wilson, I. B., Wong, M. D., Shapiro, M. F., & Cleary, P. D. (2005). Predictors and consequences of negative physician attitudes toward HIV-infected injection drug users. *Archives of Internal Medicine, 165*(6), 618-623.

Dutta, A., Wirtz, A. L., Baral, S., Beyrer, C., & Cleghorn, F. R. (2012). Key harm reduction interventions and their impact on the reduction of risky behavior and HIV incidence among people who inject drugs in low-income and middle-income countries. *Current Opinion in HIV and AIDS, 7*(4), 362-368.

Eades, C. E., Ferguson, J. S., & O'Carroll, R. E. (2011). Public health in community pharmacy: a systematic review of pharmacist and consumer views. *BMC Public Health, 11*(1), 582.

Fedorova, E. V., Skochilov, R. V., Heimer, R., Case, P., Beletsky, L., Grau, L. E., . . . Shaboltas, A. V. (2013). Access to syringes for HIV prevention for injection drug users in St. Petersburg, Russia: syringe purchase audit study. *BMC Public Health, 13*(1), 183.

Feyissa, G. T., Abebe, L., Girma, E., & Woldie, M. (2012). Stigma and discrimination against people living with HIV by healthcare providers, Southwest Ethiopia. *BMC Public Health, 12*(1), 522.

Ford, R., Bammer, G., & Becker, N. (2009). Improving nurses' therapeutic attitude to patients who use illicit drugs: workplace drug and alcohol education is not enough. *International Journal of Nursing Practice, 15*(2), 112-118.

Goffman, E. (1963). *Stigma: Notes on a spoiled identity*: Englewood Cliffs, NJ: Prentice-Hall.

Government of Tajikistan. (2015). *UNGASS Country Progress Report, 2015*. Retrieved from http://www.unaids.org/sites/default/files/country/documents/TJK_narrative_report_2015.pdf

Gudykunst, W. B., Gao, G., Schmidt, K. L., Nishida, T., Bond, M. H., Leung, K., . . . Barraclough, R. A. (1992). The Influence of Individualism Collectivism, Self-Monitoring, and Predicted-Outcome Value on Communication in Ingroup and Outgroup Relationships. *Journal of Cross-Cultural Psychology, 23*(2), 196-213. doi:10.1177/0022022192232005

Harris, C. (2005). Desire versus Horniness: sexual relations in the collectivist society of Tajikistan. *Social Analysis*, 78-95.

Henningham, J. (1996). A 12-item scale of social conservatism. *Personality and Individual Differences, 20*(4), 517-519.

Herek, G. M., Widaman, K. F., & Capitanio, J. P. (2005). When sex equals AIDS: Symbolic stigma and heterosexual adults' inaccurate beliefs about sexual transmission of AIDS. *Social Problems, 52*(1), 15-37.

Ho, D. Y.-F., & Chiu, C.-Y. (1994). Component ideas of individualism, collectivism, and social organization: An application in the study of Chinese culture. In U. Kim, H. C. Triandis, C. Kagitcibasi, S. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method and applications.* (Vol. 18, pp. 251–266). California, USA: Sage Publications, Inc.

Ibragimov, U. (in progress-a). Pharmacists' stigmatization of people who inject drugs (PWID) in Tajikistan: sociocultural context and implications for promoting prevention services.

Ibragimov, U. (in progress-b). Structural equation modelling of pharmacy students' attitudes about providing sterile syringes to people who inject drugs in Tajikistan.

Ibragimov, U., Latypov, A., Jamolov, P., & Khasanova, E. (2011). *Needs assessment among opiate users in Dushanbe-city in 2010: the qualitative assessment.* Retrieved from Dushanbe, Tajikistan:

Janoff-Bulman, R., & Carnes, N. C. (2013). Surveying the moral landscape moral motives and group-based moralities. *Personality and Social Psychology Review*, 1088868313480274.

Kamarulzaman, A., & Saifuddeen, S. (2010). Islam and harm reduction. *International Journal of Drug Policy, 21*(2), 115-118.

Khashimova, U. (2010). *The Islamist Insurgency in Tajikistan*. Retrieved from http://old.cacianalyst.org/?q=node/5422

Kline, R. B. (2014). *Principles and practice of structural equation modeling* (3 ed.). New York: Guilford press.

Latypov, A. (2009). Understanding post 9/11 drug control policy and politics in Central Asia. *International Journal of Drug Policy, 20*(5), 387-391. doi:http://dx.doi.org/10.1016/j.drugpo.2008.11.002

Latypov, A. (2011). The Soviet doctor and the treatment of drug addiction:" A difficult and most ungracious task". *Harm reduction journal, 8*(1), 1.

Latypov, A. (2012). *On the Road to "H": Narcotic Drugs in Soviet Central Asia*. Retrieved from http://037eabf.netsolhost.com/wordpress/wp-content/uploads/2013/10/Research_Paper_1.pdf

Laythe, B., Finkel, D., & Kirkpatrick, L. A. (2001). Predicting prejudice from religious fundamentalism and right-wing authoritarianism: a multiple-regression approach. *Journal for the Scientific Study of Religion, 40*(1), 1-10.

Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual review of Sociology*, 363-385.

Link, B. G., Yang, L. H., Phelan, J. C., & Collins, P. Y. (2004). Measuring mental illness stigma. *Schizophrenia bulletin, 30*(3), 511-541.

MacArthur, G. J., van Velzen, E., Palmateer, N., Kimber, J., Pharris, A., Hope, V., . . . Goldberg, D. (2014). Interventions to prevent HIV and hepatitis C in people who inject drugs: a review of reviews to assess evidence of effectiveness. *International Journal of Drug Policy, 25*(1), 34-52.

Mashburn, J. H. (2003). *Using the theory of planned behavior to predict Texas community pharmacists' willingness to provide sterile syringes to known or suspected intravenous drug users (Doctoral dissertation)*.

Matheson, C., Bond, C. M., & Mollison, J. (1999). Attitudinal factors associated with community pharmacists' involvement in services for drug misusers. *Addiction, 94*(9), 1349-1359.

Matheson, C., Bond, C. M., & Tinelli, M. (2007). Community pharmacy harm reduction services for drug misusers: national service delivery and professional attitude development over a decade in Scotland. *Journal of public health, 29*(4), 350-357.

Maxwell, J. (1992). Understanding and validity in qualitative research. *Harvard educational review, 62*(3), 279-301.

Mills, H. L., White, E., Colijn, C., Vickerman, P., & Heimer, R. (2013). HIV transmission from drug injectors to partners who do not inject, and beyond: Modelling the potential for a generalized heterosexual epidemic in St. Petersburg, Russia(). *Drug and alcohol dependence, 133*(1), 242-247. doi:10.1016/j.drugalcdep.2013.04.028

Ministry of Health of Tajikistan. (2014). *Results of sentinel surveillance among injecting drug users in Tajikistan, 2014*. Retrieved from

Montano, D. E., & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health behavior and health education: Theory, research, and practice, 4*, 67-95.

Morris, M., Podhisita, C., Wawer, M. J., & Handcock, M. S. (1996). Bridge populations in the spread of HIV/AIDS in Thailand. *AIDS (London, England), 10*(11), 1265-1271.

Narayanan, S., Vicknasingam, B., & Robson, N. M. H. (2011). The transition to harm reduction: Understanding the role of non-governmental organisations in Malaysia. *International Journal of Drug Policy, 22*(4), 311-317.

Otiashvili, D., Latypov, A., Kirtadze, I., Ibragimov, U., & Zule, W. (2016). Drug preparation, injection, and sharing practices in Tajikistan: a qualitative study in Kulob and Khorog. *Substance abuse treatment, prevention, and policy, 11*(1), 1-8. doi:10.1186/s13011-016-0065-2

Palamar, J. J., Kiang, M. V., & Halkitis, P. N. (2011). Development and psychometric evaluation of scales that assess stigma associated with illicit drug users. *Substance use & misuse, 46*(12), 1457-1467.

Palmateer, N., Kimber, J., Hickman, M., Hutchinson, S., Rhodes, T., & Goldberg, D. (2010). Evidence for the effectiveness of sterile injecting equipment provision in preventing hepatitis C and human immunodeficiency virus transmission among injecting drug users: a review of reviews. *Addiction, 105*(5), 844-859.

Papadopoulos, C., Foster, J., & Caldwell, K. (2013). 'Individualism-Collectivism' as an Explanatory Device for Mental Illness Stigma. *Community Mental Health Journal, 49*(3), 270-280. doi:10.1007/s10597-012-9534-x

Perlis, T. E., Des Jarlais, D. C., Friedman, S. R., Arasteh, K., & Turner, C. F. (2004). Audio-computerized self-interviewing versus face-to-face interviewing for research data collection at drug abuse treatment programs. *Addiction, 99*(7), 885-896.

Pescosolido, B. A., Martin, J. K., Lang, A., & Olafsdottir, S. (2008). Rethinking theoretical approaches to stigma: a Framework Integrating Normative Influences on Stigma (FINIS). *Social science & medicine (1982), 67*(3), 431-440. doi:10.1016/j.socscimed.2008.03.018

Pollini, R. A., Gallardo, M., Ruiz, S., Case, P., Zaller, N., & Lozada, R. (2014). Over-the-Counter But Out of Reach: A Pharmacy-Based Survey of OTC Syringe Sales in Tijuana, Mexico. *Journal of Health Care for the Poor and Underserved, 25*(2), 637-651.

Pollini, R. A., Lozada, R., Gallardo, M., Rosen, P., Vera, A., Macias, A., . . . Strathdee, S. A. (2010). Barriers to pharmacy-based syringe purchase among injection drug users in Tijuana, Mexico: a mixed methods study. *AIDS and Behavior, 14*(3), 679-687.

Rhodes, T., Lowndes, C., Judd, A., Mikhailova, L. A., Sarang, A., Rylkov, A., . . . Alpatova, T. (2002). Explosive spread and high prevalence of HIV infection among injecting drug users in Togliatti City, Russia. *Aids, 16*(13), F25-F31.

Rich, J. D., Martin, E. G., Macalino, G. E., Paul, R. V., McNamara, S., & Taylor, L. E. (2002). Pharmacist support for selling syringes without a prescription to injection drug users in Rhode Island. *Journal of the American Pharmacists Association, 42*(6s2), S58-S61.

Scott, J., & Mackridge, A. J. (2009). Pharmacy support staff involvement in, and attitudes towards, pharmacy-based services for drug misusers. *International journal of pharmacy practice, 17*(6), 325-332.

Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*(3), 248-279.

Simoes, A. A., Bastos, F. I., Moreira, R. I., Lynch, K. G., & Metzger, D. S. (2006). A randomized trial of audio computer and in-person interview to assess HIV risk among drug and alcohol users in Rio De Janeiro, Brazil. *Journal of substance abuse treatment, 30*(3), 237-243.

Singelis, T. M., Triandis, H. C., Bhawuk, D. P., & Gelfand, M. J. (1995). Horizontal and vertical dimensions of individualism and collectivism: A theoretical and measurement refinement. *Cross-cultural research, 29*(3), 240-275.

Smolak, A. (2010). Contextual factors influencing HIV risk behavior in Central Asia. *Culture, health & sexuality, 12*(5), 515-527. doi:10.1080/13691051003658135

Tajikistan Statistics Agency. (2014). *Regions of Tajikistan*. Retrieved from http://www.stat.tj/ru/img/c476d0ddf3ea68cc502ba419312173a6_1418985745.pdf

Taussig, J., Junge, B., Burris, S., Jones, T. S., & Sterk, C. E. (2002). Individual and structural influences shaping pharmacists' decisions to sell syringes to injection drug users in Atlanta, Georgia. *Journal of the American Pharmacists Association, 42*(6s2), S40-S45.

Tilson, H., Aramrattana, A., Bozzette, S., Celentano, D., Falco, M., Hammett, T., . . . Schottenfeld, R. (2007). *Preventing HIV infection among injecting drug users in high-risk countries: an assessment of the evidence*.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of personality, 69*(6), 907-924.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika, 41*(3), 321-327.

Waluyo, A., Culbert, G. J., Levy, J., & Norr, K. F. (2014). Understanding HIV-related Stigma Among Indonesian Nurses. *Journal of the Association of Nurses in AIDS Care*.

Watson, T., & Hughes, C. (2012). Pharmacists and harm reduction: a review of current practices and attitudes. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada, 145*(3), 124-127. e122.

Wodak, A., & Cooney, A. (2004). *Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users*. Retrieved from Geneva: http://www.who.int/entity/hiv/pub/prev_care/effectivenesssterileneedle.pdf?ua=1

Zang, C., Guida, J., Sun, Y., & Liu, H. (2014). Collectivism culture, HIV stigma and social network support in Anhui, China: a path analytic model. *AIDS Patient Care STDS, 28*(8), 452-458. doi:10.1089/apc.2014.0015

Zule, W. A., Latypov, A., Otiashvili, D., Kirtadze, I., Ibragimov, U., & Bobashev, G. V. (2015). Factors that influence the characteristics of needles and syringes used by people who inject drugs in Tajikistan. *Harm reduction journal, 12*(1), 1.

Zule, W. A., Otiashvili, D., Latypov, A., Bangel, S., & Wechsberg, W. (2017). Gender disparities in HIV prevalence and risk behaviors among people who inject drugs in Tajikistan. *Drug & Alcohol Dependence, 171*, e225. doi:10.1016/j.drugalcdep.2016.08.614

Chapter 4. Structural equation modelling of pharmacy students' attitudes related to providing sterile syringes to people who inject drugs in Tajikistan

ABSTRACT

Introduction. Engaging pharmacy students can be an effective way to improve future pharmacists' willingness to provide syringes to PWID as part of a national HIV prevention strategy. This study assesses the theory-driven model explaining Tajikistani pharmacy students' willingness to provide syringes to PWID to inform anti-stigma interventions targeting future pharmacists.

Methods. We surveyed 240 students from the Pharmacy Department of Tajik State Medical University in Dushanbe about their willingness to provide syringes, attitudes and beliefs related to syringe provision, stigma against PWID, social conservatism, and HIV and drug-related knowledge. Structural equation modelling tested the relationships among these variables.

Results. In the final model students' willingness to provide syringes positively correlated with favorable attitudes towards provision of syringes to PWID ($\beta=0.47$, $p<0.001$), and negatively with stigma against PWID ($\beta=-0.19$, $p=0.02$) and social conservatism ($\beta=-0.25$, $p=0.002$). Attitudes towards provision of syringes were negatively associated with stigma against PWID ($\beta=-0.21$, $p=0.01$). Stigma also positively correlated with social conservatism ($\beta=0.35$, $p<0.001$).

Conclusion: Our findings highlight the role of attitudinal and contextual factors, especially stigma, in influencing future pharmacists' willingness to provide syringes to PWID. Educational anti-stigma interventions should be introduced into the Pharmacy Departments' curriculum to ensure long-term accessibility of syringes for PWID in pharmacies.

Introduction

The high prevalence of HIV and hepatitis C virus (HCV) among people who inject drugs (PWID) in Tajikistan is a serious public health challenge for this poorest post-Soviet Central Asian country. According to 2014 surveillance, national prevalence estimates for these infections among PWID were 12.9% and 22.7%, respectively, with use of non-sterile injection equipment being one of the main factors fueling spread of these infections (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014). More recent data indicates that HIV prevalence may be particularly high among urban PWID, reaching 26.5% (Zule, Otiashvili, Latypov, Bangel, & Wechsberg).

Distribution of sterile needles and syringes has been shown to reduce the risky injection practices responsible for HIV and HCV epidemics among PWID (Abdul-Quader et al., 2013; Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012; Palmateer et al., 2010). PWID in Tajikistan may obtain syringes via the wide network of community-based outreach needle and syringe programs (NSPs) or purchase them in pharmacies if NSP services are unavailable in the area or closed outside of working hours (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014; Otiashvili, Latypov, Kirtadze, Ibragimov, & Zule, 2016). NSPs operate legally in the country; however, policies regulating syringe sales in pharmacies are vague, effectively leaving decision to sell syringes without a prescription to pharmacists (Beardsley & Latypov, 2012; Boymatov, 2015). Qualitative studies have shown that Tajikistani pharmacists who stigmatize PWID may refuse to sell them syringes, mistreat them, or report them to the police, thus limiting their access to sterile syringes (Ibragimov, in progress-a; Otiashvili et al., 2016), highlighting the need to address pharmacists' attitudes towards PWID. Promotion of positive attitudes towards provision of services to PWID is also sine qua non for the establishment of pharmacy-based NSP

(non-existent in Tajikistan), which have been shown to reduce HIV risk among this population (MacArthur et al., 2014; Tilson et al., 2007; Wodak & Cooney, 2004).

Engaging pharmacy students is an efficient way to improve future service providers' willingness to provide syringes and other HIV prevention services to PWID. Pharmacy departments of medical schools represent a convenient entry point for raising future pharmacists' awareness of HIV and drug dependency issues, reducing stigma and improving willingness to interact with stigmatized populations (Balfour et al., 2010; Blumenthal, Springer, Jones, & Sterk, 2002; Nguyen, Chen, & O'Reilly, 2012; Patten et al., 2012). Development of effective interventions promoting pharmacy-based services to PWID among pharmacy students requires better knowledge of the precursors of stigma and attitudes towards provision of services to PWID. However, no studies assessing predictors of willingness to provide HIV-related services to PWID or to other marginalized populations have been conducted in Tajikistan or other Central Asian countries. Little is known about the socio-contextual factors shaping attitudes among service providers in the region either. To address this gap in the literature, this study aims to test a model based on the Integrated Behavioral Model (IBM) (Montano & Kasprzyk, 2008) explaining Tajikistani pharmacy students' willingness to provide syringes to PWID. The proposed model follows IBM proposition that an individual's willingness (*behavioral intent)* to sell syringes is the function of belief factors – *attitudes*, *perceived norms* and *self-efficacy* related to selling syringes to PWID. In our model these belief constructs are influenced by *stigma* and other background contextual factors, such as *social conservatism, perceived drug controllability, personal exposure to PWID* and *HIV and drug-related knowledge*.

Methods

Setting

We collected data from students of the Pharmacy Department of Tajik State Medical University located in Dushanbe (the capital of Tajikistan) in May-June 2015. The students start their 5-year pharmacy training to earn pharmacist's degree without taking pre-requisite courses (admission is based on completion of a high-school certificate and entry test results). There were 340 students enrolled at the Department at the time of the study.

Procedures

Data were collected via a computer-assisted self-interview (CASI) questionnaire in Tajik and Russian languages. Questionnaires were developed by translating the original measures from English to Tajik and Russian languages, modifying the measures as described above, then translating to English and independently back-translating to Tajik and Russian to ensure the identity of both versions. Pre-testing of the questionnaires was conducted among a separate convenience sample of pharmacists (n=25). Informed oral consent was obtained. No personally identifying information was collected. We offered USD $4 in local currency to participants as a compensation for their time and efforts. The study was approved by the Medical Ethics Committee of the Ministry of Health of Tajikistan and the Emory University Institutional Review Board.

Recruitment

Inclusion criteria for the participants were (a) 18 years old and above, (b) being a student of the Pharmacy Department, (c) willingness to provide informed consent. The Dean's office sent informational brochures to all students above 18 (n=316) inviting them to the study. Students

willing to participate contacted the study team via phone numbers icluded in brochures, provided oral informed consent and completed the survey.

Measures

We adapted most of the original measures based on the findings from our qualitative study among pharmacists and pharmacy students conducted in Tajikistan in November-December 2014 (see Chapter 2). The *behavioral intent* scale included three items measuring willingness to provide syringes to PWID (a typical item was '*I am willing to sell syringes to known or suspect PWID without prescription*') with a 5-point 'strongly disagree' (1) – 'strongly agree' (5) Likert scale. Higher scores correspond to higher willingness to provide syringes.

The scale measuring *attitudes towards providing syringes to PWID* consisted of 13 items. Two of them were direct measures of attitudes (e.g. "*In general, is selling syringes to PWID without prescription good or bad?")* with response option ranging from '*very bad*' (1) to '*very good*' (5). The rest of items measured the likelihood of positive (e.g. "*Reduces HIV transmission*") and negative (e.g. *"Encourages drug use"*) outcomes of providing syringes to PWID measured on a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert type response scale. This measure was adapted from a scale by Mashburn (2003) by adding items derived from qualitative study (e.g. "*Will lead to problems with the state inspecting agencies*"). We also changed the original 7-point *'very likely' – 'very unlikely'* response scale to a 5-point Likert scale as pre-test participants indicated their preference for the latter. Higher scores indicate more positive attitudes towards providing syringes to PWID.

Perceived norms were assessed by asking the participants about whether people they deem important (referent persons) approve providing syringes to PWID (*normative beliefs*) and if the participants would follow referent person's advice on this matter (*motivation to comply*).

The list of referent persons (other pharmacists, Pharmacy Monitoring Service inspector, police officers, religious leaders, family members and friends) was identified during the qualitative study among pharmacists and pharmacy students (Ibragimov, in progress-a). Both normative beliefs and motivation to comply sub-constructs were measured on a 5-point '*strongly disagree*' (-2) – *'strongly agree'* (2) Likert type response scale. To derive the composite perceived norms value, we multiplied every normative belief value by the relevant motivation to comply value as recommended by TPB authors (Montano & Kasprzyk, 2008). Higher scores relate to more positive perceived norms about providing syringes to PWID.

The *self-efficacy* scale for providing syringes to PWID included five items measuring perceived control over external factors influencing provision of syringes to PWID. The items had the form: *'[An external factor] will make it easy or difficult to provide syringes to PWID'*. External barriers and facilitating factors (i.e. Pharmacy Monitoring Service, police, policies regulating syringe sale, salary supplement and workload) were elicited during the qualitative stage. The five-point response scale ranged from *'very difficult'* (-2) to *'very easy'* (+2). In addition, we included four items measuring self-efficacy (e.g. '*Selling syringes to PWID is completely under my control'* or *'Distributing syringes to PWID for free would be easy for me')* on a 5-point '*strongly disagree*' (-2) – *'strongly agree'* (2) Likert scale. Higher composite scores correspond to higher self-efficacy.

The *stigma towards PWID* scale is based on the scale proposed by Palamar, Kiang, and Halkitis (2011). The original scale consisted of 7 items (for example, "*Heroin users are weak minded*") measured on a 5-point Likert scale ranging from '*strongly disagree*' to '*strongly agree'*. We modified the scale by adding 6 more items based on themes (e.g. drug use being a sin, PWID harming families and society) that emerged from the individual interviews conducted

among pharmacists and pharmacy students in Tajikistan (see Results section). A sample item is "*Heroin users harm their families*". Higher scores equate stronger stigmatization of PWID.

We revised a 13-item *social conservatism* scale by Henningham (1996) measuring agreement with liberal or conservative values by removing 6 items not relevant to the context of Tajikistan (e.g. '*Asian immigration' or 'Bible truth'*) and replacing them with more relevant items such as '*Hijab for all wome*n' or '*Condom education for high schoolers'*. We also added two items measuring religiosity (e.g. *'Religion is very important for me'*) and changed the response options from '*yes/no'* to a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert scale to increase variance in data. Higher scores indicate more conservative values.

The *drug use controllability* scale proposed by Brener and Von Hippel (2008) consists of four items (e.g. '*PWID can stop using drugs whenever they want to'*) with a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert scale. Higher scores relate to stronger belief in controllability of drug use.

The *exposure to drug users index* (Palamar et al., 2011) assessed participants' encounters with heroin users in various settings and situations (e.g. school, family, work). An example of an item is '*I have lived with a person who uses heroin*'. Response options consisted of 'yes' (1), 'no' (0) and 'not sure' (0). We also added one questions measuring students' perceptions of pervasiveness of injecting drug use in the city ('*There is a lot of PWID in my city'*) measured on a 5-point '*strongly disagree*' (1) – *'strongly agree'* (5) Likert scale (values of this item were divided by five to maintain the original range). Higher index scores indicate higher perceived exposure to PWID.

The *HIV and drug dependency knowledge index* was derived from the HIV-KQ-18 measure (Carey & Schroder, 2002) assessing knowledge of basic facts related to HIV

transmission (a typical item: '*A person can get HIV by sharing a glass of water with someone who has HIV'*) with '*yes*', '*no*' or *'don't know'* response options with each correct answer resulting in one score summed into the total index score. We excluded three items that were perceived either as too explicit (e.g. a question about oral sex) or irrelevant to Tajikistan's context (a question about natural skin condom) during pre-test. We added two questions about HIV transmission via used syringes (e.g. '*Washing syringes in bleach can reduce the risk of HIV infection*') and an item about possibility of transmitting HIV via saliva, a common misconception. We also included two items about drugs used for medication assisted treatment (methadone) and reversal of opiate overdose (Naloxone) to assess knowledge about drug-related issues, where participants were asked to select the right answer out of five. Higher index score indicate greater knowledge.

Demographics. We collected data on participants' age, gender, marital status, number of years lived in the city and pharmacy program year.

Analysis

We conducted descriptive analyses of the survey data. Analysis of missing data indicated that missing observations for sociodemographic covariates ranged from 0.4% (marital status) to 7.9% (years lived in the city). For some composite measures (social conservatism, perceived norms, self-efficacy and HIV and drug dependence knowledge index) the percentage of missing values was quite high, reaching 20% and above. However, for the re-specified measures that were part of the final model, missingness was lower – 15.4% for social conservatism scale (7 items), 5.8% for behavioral intent and lower for other scales. In the final model 13.8% (n=33) data patterns were missing. We addressed missing data using a full information maximum

likelihood (FIML) estimation algorithm able to produce unbiased estimates under missing at random mechanism (Enders & Bandalos, 2001)

We recoded negatively worded items, calculated mean scores for each composite measure and treated them as continuous variables for bivariate analysis. Univariate analyses produced descriptive statistics characterizing measures of central tendency (mean) and spread (standard deviation) for continuous variables and frequency and count for dichotomous ones. Distribution of responses for each composite measure was analyzed using histograms as well as skew and kurtosis. Since all response options were predetermined, no outliers were expected to occur.

Basic psychometric characteristics of the scales were explored. Inter-item reliability was assessed by calculating Cronbach's alpha. Scales with an alpha statistic <0.70 were considered for modification, where possible. All statistical analyses used 5% significance level; effect sizes and standard errors were reported for all statistical tests.

Validity analysis. Construct validity of the scales was explored by identifying their factor loadings of the scales using *exploratory factor analysis* (EFA). We used maximum likelihood (ML) method to extract latent factors, since this method is better suited for inferring the results from the sample to larger population and provides both standard errors for the model parameters as well as goodness of fit statistics (Bandalos & Finney, 2010). The final decision on the number of factors to retain was made by comparing the results of different methods such as Velicer's Minimum Average Partial procedure (Velicer, 1976), eigenvalues greater than 1, scree-plot and weighing in theoretical considerations. Considering the high possibility of correlation between the factors, we used oblique rotation method (*promax*). Given the exploratory character of the study, we retained several competing models (factor solutions and related items) for the scales to

compare them during the CFA stage. We excluded items with low item loadings (below 0.4) and tested convergent and discriminant properties of the modified scales using Pearson's correlation test. We also assessed association between the modified scales and dichotomous variables (main outcome and demographics) as well as between dichotomous variables using simple logistic regression.

Identified latent factor structure was confirmed using *confirmatory factor analysis* (CFA). A priori models related to each scale were specified based on factors and items belonging to each factor identified during the EFA stage. Models were estimated each time a change has been made. Model fit was assessed using the following indicators: (a) chi-square test, where non-significant test at alpha=0.05 indicates good fit; (b) root mean square error of approximation (RMSEA) index with the value above 0.08 indicating poor fit; (c) comparative fit index (CFI) with values of 0.95 and more suggesting good fit (Bandalos & Finney, 2010). If a model demonstrated poor fit, we respecified it based on modification indices (although model respecification is discouraged in CFA by some authors, since its main purpose is testing the fit of a priori models and understanding the underlying structure of the scale variables, our decision can be justified by the exploratory nature of the study). Each modification was added one at a time, the resulting model was estimated anew and goodness of fit statistics and model parameters were obtained for each modification.

Structural Equation Modelling (SEM). In the final step, we tested the structural model of the relationships among the latent factors and control variables. In order to address the problems with convergence of the initial model we assessed the output to detect potential causes such as improper values (negative error variances, factor correlations greater than one, very large coefficient values) and excluded variables causing these problems from the model.

When model convergence was achieved, we tested the goodness of fit of the model using the same goodness of fit indices that were applied for CFA. We tested alternative models with different factor structures (e.g. with two and three factor loadings for self-efficacy scale) as suggested by the EFA results. To ensure adequate goodness of fit we iteratively re-specified the models by adding error covariances between the indicators of the same factors based on the modification indices. Further, we excluded indicators with low factor loadings and removed some of the latent factors that had low reliability or factor-item correlation.

We did not report parameter estimates for the models with improper fit. For the model with adequate model fit we report unstandardized and fully standardized path coefficients, standard errors for unstandardized path coefficients and significance test results (p-values). Standardized coefficients for unidimensional variables were squared to derive variance (R^2) of this variable explained by the factor it pertains. Factor quality was assessed based on the magnitude of factor-item correlation expecting that majority of items would have R^2 greater than 0.5.

All statistical analyses prior to structural equation modeling (SEM) were performed in STATA 14.0 package (StataCorp LP, College Station, TX). SEM was conducted using Mplus 7.4 software (Muthen & Muthen).

Results

A total of 240 students (75.9% of all eligible students) participated in the study. Sociodemographic characteristics of the sample are presented in Table 3.1. Most of the participants were male (60.4%) and unmarried (94.2%); the mean age was 20.5 years (SD 1.3).

Factor loadings of the scale items as well as uniqueness (an inverse of commonality) of each item are given in the Table 3.2. Each scale entered into the final model loaded on one latent factor. Descriptive statistics of scales and indices (from the original and final models) are presented in Table 3.3. All scales included in the final model have good (social conservatism, stigma, and attitudes) or adequate (behavioral intent) inter-item reliability.

Bivariate analysis demonstrated significant association between most of the scales (Table 3.4) with correlation coefficients being medium to small (r=0.15 to r=0.38). We found a relatively high correlation only between self-efficacy and behavioral intent measures (r=0.64). These results show good discriminant validity of the measures.

The diagram of the final SEM model results is presented in Figures 3.1 (structural model) and 3.2 (measurement model) and Table 3.5. The model had proper fit with RMSEA=0.05 and CFI =0.96. While χ^2 value was statistically significant (χ^2 =152.6, df=94, p<0.001), we considered the fact that this indicator of fit is overly conservative for sample sizes larger than 200 (Newsom, 2012). In the final model students' intent to provide syringes significantly and positively correlated with favorable attitudes towards provision of syringes to PWID (β=0.47, p<0.001), and negatively with stigma against PWID (β=-0.19, p=0.02) and social conservatism (β=-0.25, p=0.002). Attitudes towards provision of syringes were negatively associated with stigma against PWID (β=-0.21, p=0.01). There was also a statistically significant and positive correlation between stigma and social conservatism factors (β=0.35, p<0.001). The final model does not include control demographics since models with these variables had poor fit.

The model explained a relatively high proportion of behavioral intent variance (R^2 =0.37), though this estimate was lower for other dependent latent factors (Table 3.5). Factor-item correlation was adequate for behavioral intent and stigma latent variables only, where most of

items showed R^2 greater than 0.5, while factor validity for attitudes and social conservatism was limited (Table 3.6).

Discussion

We assessed the theory-driven model predicting pharmacy students' intent to provide syringes to PWID. Notably, the mean behavioral intent score (3.38 on the scale from 1 to 5) suggests that the participants were on average more willing than not to provide syringes to PWID. Furthermore, our findings support our hypothesis about the central role of stigma in influencing future pharmacists' willingness to serve PWID. According to the model, stigma may influence students' intent to provide syringes directly, and also indirectly via shaping attitudes towards this behavior, which corresponds to the literature from other parts of the world (Coffin, Linas, Factor, & Vlahov, 2000; Eades, Ferguson, & O'Carroll, 2011; Matheson, Bond, & Mollison, 1999; Rich et al., 2002; Taussig, Junge, Burris, Jones, & Sterk, 2002; Watson & Hughes, 2012). The direct and statistically significant link between stigma and intent persisted after controlling for attitudes towards providing syringes, suggesting that some participants with high stigma against PWID may be less willing to provide them syringes even if they believe in the benefits of syringe provision. We obtained somewhat similar results in our study among the pharmacists where the direct inverse link between stigma towards PWID and agreeing to sell syringes without prescription remained significant after controlling for beliefs in the positive outcomes of syringe provision (see Chapter 3).

We also demonstrated the role of social conservatism as a contextual factor associated with both stigma against PWID and the intent to provide syringes. Social conservatism has been shown to be associated with stigma against PWID in previous studies (Brener, Hippel, Kippax,

& Preacher, 2010), but its' influence over willingness to provide services to PWID has not been assessed before. The direct inverse association between social conservatism and intent to provide syringes shows that some portion of the socially conservative students may have low stigma against PWID but still be reluctant to offer them syringes. A potential explanation for this relationship may involve the concept of collectivism (not part of our model) – a notion that the well-being of the society is more important than that of its individual members and that individuals, therefore, must conform to the social norms and values. Collectivistic norms have been shown to be associated with social conservatism and prejudice (Altemeyer & Hunsberger, 1992; Clay, Terrizzi, & Shook, 2012; Gudykunst et al., 1992; Janoff-Bulman & Carnes, 2013; Sibley & Duckitt, 2008). Specifically, it may be that some of the socially conservative participants who personally hold little or no stigma against PWID refuse provision of syringes to PWID because of prevailing social norms discouraging this behavior. This proposition conforms with findings from qualitative interviews with pharmacists and pharmacy students on high level of societal stigma against PWID (see Chapter 2).

Our results also support the important theoretical linkage between the behavioral intent and attitudes towards a behavior, as predicted by IBM (Montano & Kasprzyk, 2008). However, we were not able to test the role of some of the theory-based constructs (perceived norms and self-efficacy) since models including them had poor measurement properties. Further, we found a direct link between the social conservatism and intent to provide syringes to PWID unexplained by stigmatization of PWID or by attitudes towards provision of syringes that was not part of our initial model.

Although we were not able to test the role of knowledge in predicting willingness to provide syringes, we note that on average students provided correct answers only to 67% of

knowledge questions, indicating that many students may have limited knowledge of basic HIV and drug treatment facts. Further, the inverse bivariate association between knowledge and stigma constructs suggests that students with more misconceptions about HIV and drug dependency issues may have more negative attitudes towards PWID. This finding is in line with the results of our study among practicing pharmacists, where participants with higher knowledge of HIV and harm reduction issues were more likely to agree to sell syringes without prescription (see Chapter 3). Literature from other countries also supports the link between HIV and drug related knowledge and health care providers' attitudes towards provision of services to PWID (Ding et al., 2005; Scott & Mackridge, 2009), highlighting the importance of addressing misconceptions and gaps in knowledge of future service providers.

Practical implications

Our study demonstrates the importance of addressing stigma against PWID as a significant predictor of future pharmacists' willingness to provide services to PWID (and perhaps to other marginalized populations). Our findings warrant the introduction of a comprehensive training course aimed at raising professional knowledge about HIV and drug dependence treatment and at improving attitudes towards PWID. Currently there is no such curriculum at the Pharmacy Department of the Tajik Medical University. Global literature indicates that theory-based anti-stigma interventions can be effective in changing future service providers' attitudes towards marginalized groups. For example, an intervention based on Allport's inter-group contact theory targeting pharmacy students in Canada and Australia showed that both direct (personal) and indirect (video demonstration) contacts reduced stigma towards people with mental health problems (Nguyen et al., 2012; Patten et al., 2012). More research is needed to adapt this or similar theory-driven anti-stigma interventions to the context of Tajikistan. To be

effective, the intervention should also address students' perceived conservative social norms and beliefs related to drug use and HIV prevention, considering that this study and the one conducted among practicing pharmacists (Chapter 3)(Ibragimov, in progress-a, in progress-b) have found these constructs to play role in forming willingness to provide syringes to PWID.

Study limitations and strengths

The study's cross-sectional design precludes establishment of temporality between the constructs. Measures used in the study had not been validated before, and self-reported data may be prone to biases. We were not able to test the effect of several constructs or control variables on the model (e.g., perceived norms, self-efficacy, exposure to drug users, demographic variables). We also did not account for the possibility that some of the students (not many though) might have had previous experience working in the pharmacies as pharmacy assistants upon completion of technical colleges. Our findings may have low generalizability to the students of other medical professions or to pharmacy students from other Central Asian countries.

This is, however, the first theory-driven study of pharmacy students' attitudes and willingness to provide syringes to PWID in this former Soviet region. Use of CASI helps to reduce social desirability bias in reporting sensitive issues (in the context of Tajikistan the participants may perceive attitudes towards PWID as politically sensitive matter). Application of SEM as analytical strategy allows assessment of mediated relationships between the constructs as predicted by theory and better accounts for the measurement error.

Conclusion

Our study was the first to model factors predicting pharmacy students' willingness to provide syringes to PWID in Tajikistan and in Central Asia in general. Our findings highlight the role of attitudinal and contextual factors, especially stigma, in influencing future pharmacists' willingness to provide syringes to PWID. We emphasize the need for introducing educational anti-stigma curriculum into the pharmacists' professional training program. More research is needed to adapt existing theory-driven anti-stigma interventions to the context of Tajikistan.

Tables

Table 3.1. Sociodemographic characteristics of pharmacy students' sample (n=240), Dushanbe, Tajikistan

Variable	Mean	SD	Missing, n (%)
Age, years	20.5 (range 18-25)	1.3	3 (1.3)
Years lived in the city	7.7	5.9	19 (7.9)
	Frequency, %	**Count, n**	
Pharmacy program year			5 (2.1)
1	34.2	82	
2	15.4	37	
3	20.4	49	
4	20.8	50	
5	7.1	17	
Female	39.6	95	3 (1.3)
Married	5.8	14	1 (0.4)

Table 3.2. Results of exploratory factor analysis of scales (promax rotation) for pharmacy students in Tajikistan (n=240)

Scale and items	Factor loading	Uniqueness
Stigma scale		
Heroin users (HU) have no future	0.778	0.395
HU harm families	0.773	0.402
HU harm society	0.735	0.460
HU are bad parents	0.716	0.488
Heroin use is a sin	0.673	0.547
All HU should go to prison	0.612	0.626
All HU have no integrity	0.593	0.648
I sympathize with HU	0.506	0.745
Heroin makes a person crazy	0.461	0.788
Marrying someone from an HU family is OK	0.372	0.862
HU deserve healthy long lives	0.362	0.869
Treat HU as others	0.301	0.910
Alcohol makes more aggressive than heroin	-0.250	0.938
Social conservatism scale	**Factor loading**	**Uniqueness**
Penalty for sex work	0.741	0.451
Arranged marriage	0.721	0.480
Youth to obey seniors	0.684	0.533
Hijab for all women	0.680	0.538
Penalty for same-sex sex	0.679	0.539
Religion is important for me	0.674	0.546
I am very religious [a]	0.611	0.627
Virginity till marriage for girls	0.594	0.647
Wife to obey husband	0.583	0.661
Condom education for high schoolers*	0.390	0.848
Long prison terms	0.327	0.893
Condoms to sale*	0.206	0.958
Death penalty	0.154	0.976
Euthanasia*	0.118	0.986
Drug controllability scale	**Factor loading**	**Uniqueness**
Use drug because of character weakness [a]	0.774	0.400
People who inject drugs are to blame for their addiction [a]	0.744	0.447
People who inject drugs have no willpower	0.419	0.824
A person can stop injecting drugs if they want to	0.007	1.000
Attitudes towards providing syringes to PWID	**Factor loading**	**Uniqueness**
Direct measure		
Over the counter sale is good [b]	0.797	0.365
Free distribution of syringes is good [b]	0.793	0.371
Outcomes of provision of syringes to PWID		

Will encourage drug use*	0.675	0.545
Will impact safety of staff*	0.659	0.566
Will result in theft in the pharmacy* [a]	0.658	0.568
Will cause problems with state controllers* [a]	0.636	0.596
Will interfere with pharmacy work*	0.599	0.642
Customers will be afraid to come*	0.590	0.652
PWID may die*	0.555	0.692
Will help to prevent HIV	0.551	0.697
Will be an opportunity to provide information about HIV	0.539	0.709
Will take a lot of my time*	0.408	0.833
Will increase dirty needles in the community*	0.380	0.856
Perceived norms (subjective norms x motivation to comply)		
Police thinks I should provide syringes to PWID	0.691	0.522
Pharm monitoring agency	0.653	0.573
Religious leaders	0.500	0.750
Pharmacists I know	-0.027	0.999
Family members	-0.143	0.980
Friends	-0.181	0.967
Self-efficacy		
Current policies make provision of syringes easier	0.834	0.305
Police makes provision of syringes easier	0.793	0.371
Pharmacy monitoring service makes provision of syringes easier	0.784	0.385
Free distribution of syringes to PWID is easy for me (direct)	0.478	0.771
Selling syringes OTC to PWID is easy for me (direct)	0.470	0.779
Salary supplement makes provision of syringes easier	0.321	0.897
Lack of time due to overload will make it difficult	0.133	0.982
Free distribution of syringes to PWID depends on me (direct)	-0.129	0.983
Selling syringes OTC to PWID depends on me (direct)	-0.1498	0.9776
Behavioral intent scale	**Factor loading**	**Uniqueness**
Willing to sell syringes to PWID without prescription	0.839	0.296
Willing to distribute syringes to PWID for free [b]	0.618	0.618
Would to sell syringes to anyone without prescription [a]	0.547	0.701

Items included to the final models for both pharmacists and pharmacy students are in bold font.

[a] Items included into the final model for pharmacists only.

[b] Items included into the final model for students only.

*Reverse coded items.

Table 3.3. Descriptive statistics of composite measures for pharmacy students in Tajikistan (n=240)

Scale/Index	Missing, n (%)	Mean	SD	Reliability (Cronbach's alpha or Kuder-Richardson's 20)
Stigma (17 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – stronger stigma)	14 (10.0)	3.52	0.65	0.82
Stigma (4 final model items)*	6 (2.5)	4.12	0.94	0.84
Drug use controllability (4 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – stronger belief in controllability)	11 (4.6)	3.54	0.73	0.51
Social conservatism (14 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – more conservative)	47 (19.6)	3.79	0.57	0.80
Social conservatism (6 final model items)	37 (15.4)	4.05	0.78	0.83
Attitudes towards providing syringes (13 items response options: *Str. disagree* '0' to *Str. agree* '5', higher – more positive)	33 (13.8)	2.43	0.71	0.87
Attitudes towards providing syringes (4 final model items)	8 (3.3)	2.51	0.93	0.80
Behavioral intent (3 items, response options: *Str. disagree* '0' to *Str. agree* '5', higher – more willing)	16 (6.7)	3.38	0.97	0.74
Behavioral intent (2 final model items)	14 (5.8)	3.06	1.09	0.73
HIV and harm reduction knowledge index (15 items, response options: *True*, *False*, *Don't Know*, higher – better knowledge)	50 (20.8)	0.67	0.19	0.66
Personal exposure to heroin users index (9 items *Yes* '1', *No* '0', *Not Sure* '0', higher – more exposure)	24 (10.0)	0.25	0.18	0.63
Perceived norms (7 items, normative beliefs x motivation to comply; response options: *Str. disagree* '-2' to *Str. agree* '+2', higher – more positive perceived norms)	46 (19.2)	0.47	0.62	0.57
Self-efficacy (10 items): direct measure (4 items, *Str. disagree* '-2' to *Str. agree* '+2') + indirect measure (6 items, perceived barriers [*'very difficult'* '-2' to *'very easy'* '+2'] x [control belief, *Str. disagree* '-2' to *Str. agree* '+2'], higher – more self-efficacious)	49 (20.4)	-0.10	0.64	0.65

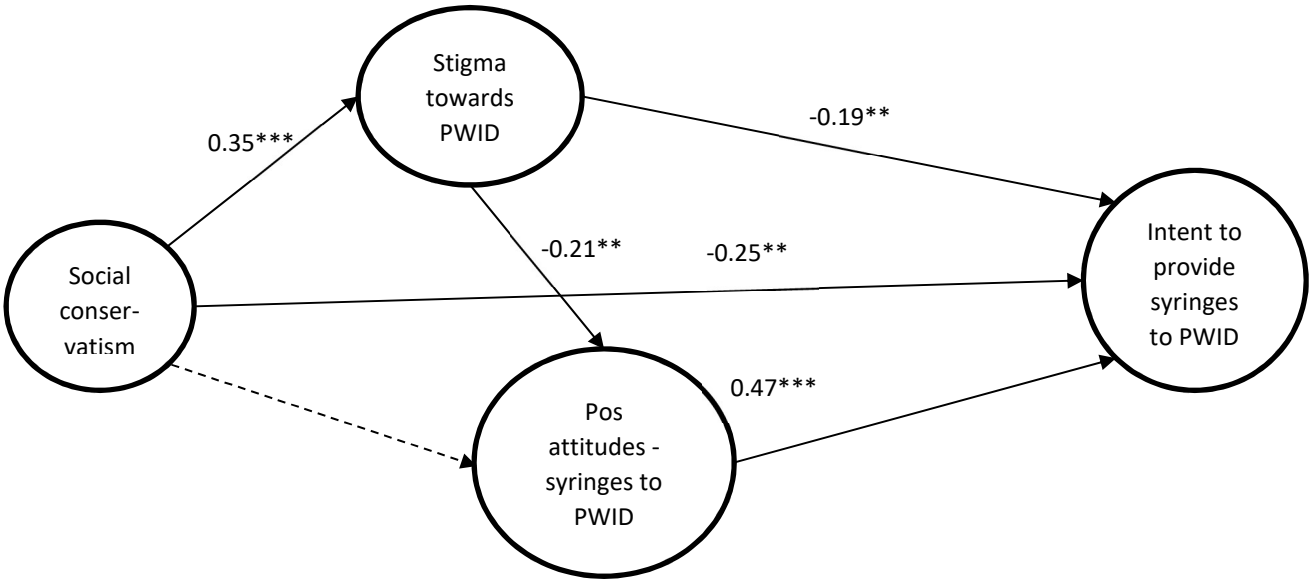
*Scales from the final model are in bold font

Table 3.4. Bivariate association between demographic characteristics and composite measures for pharmacy students (n=240)

	Age, years	**School year (OR)**	**Female (OR)**	**Social conser-vatism**	**Drug control-lability beliefs**	**HIV and drug knowledge score**	**Personal encounters with PWID**	**Stigma-tization of PWID**	**Attitudes towards providin g syringes to PWID**	**Self-efficacy**	**Perceive d norms**
Social conservatism score (higher - more conservative)	-0.06	**ns**	ns	1.00							
Drug use controllability beliefs (higher - stronger)	0.01	ns	ns	0.14	1.00						
HIV and drug knowledge score Higher – better	**0.21****	**1.24*****	ns	0.15	-0.12	1.00					
Personal encounters with PWID (higher - more frequent)	0.01	ns	ns	**0.15***	**0.22****	**0.17***	1.00				
Stigmatization of PWID (higher - stronger stigma)	**-0.16***	**0.95****	ns	**0.31*****	**0.21*****	**-0.24****	0.11	1.00			
Attitudes towards providing syringes to PWID (higher - more favorable)	0.13	ns	ns	-0.07	**-0.35*****	**0.19***	-0.01	**-0.23****	1.00		
Self-efficacy (higher - more self-efficacious)	**0.27*****	**1.06***	**1.06***	0.04	**-0.18****	0.01	**0.17***	-0.03	**0.38*****	1.00	
Perceived norms (higher - stronger beliefs in referent persons' positive attitudes re providing syringes to PWID)	0.05	ns	**0.95***	0.02	0.05	**0.21****	0.02	**-0.22****	0.12	-0.10	1.00
Behavioral intent to provide syringes (higher – more likely)	**0.27*****	**1.20*****	ns	**-0.17***	**-0.14****	0.07	0.02	**-0.20****	**0.34*****	**0.64*****	-0.05

* p<0.05, ** p<0.01, *** p<0.0

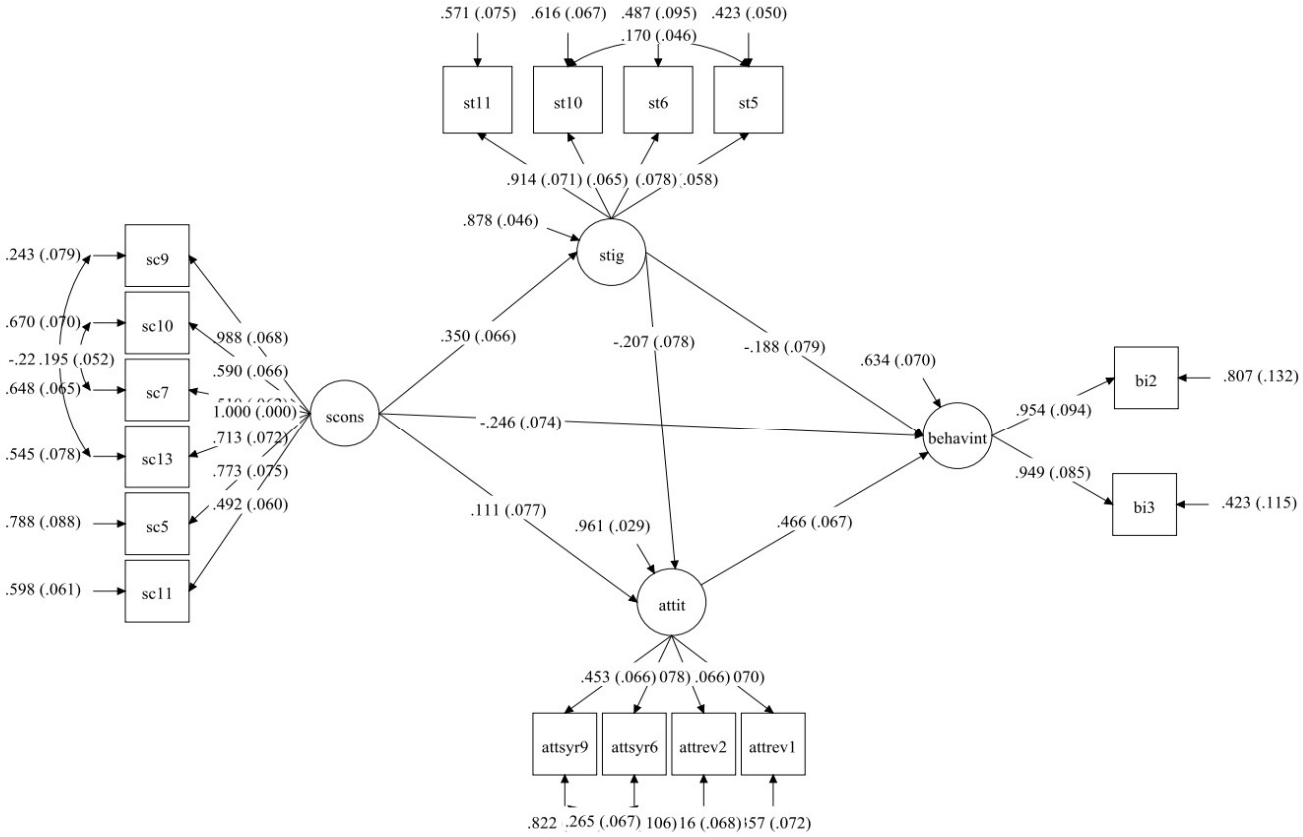
Figure 3.1. Final structural model of Tajikistani pharmacy students' willingness to provide syringes to PWID



* p<0.05, ** p<0.01, *** p<0.001

Note: Only standardized estimates are shown. Solid arrows denote associations between the constructs that are significant at α=0.05; dotted arrows show associations that are non-significant at α=0.05.

Figure 3.2. Final measurement model of Tajikistani pharmacy students' willingness to provide syringes to PWID



Note: Significant (at α=0.05) standardized estimates and standard errors (in parenthesis) are shown. Circles refer to the latent constructs, boxes – to directly measured items. Construct names: 'scons' – social conservatism; 'stig' – stigma against PWID; 'attit' – attitudes related to provision of syringes to PWID; 'behavint' – intent to sell syringes without prescription. For the names of individual items see Table 3.7.

Table 3.5. Results of testing the final model of Tajikistani pharmacy students' willingness to provide syringes to PWID (n=240) – factor loadings, covariates and explained variance of latent factors

Latent factors and indicators	Standar-dized coeff. (STDYX)	Unstan-dardized coeff.	Standard error (SE) for unstan-dardized coeff.	Unstan-dardized coeff./SE	p-value
Behavioral intent					
Willing to sell syringes over-the-counter to PWID	0.73	1.00	0.00	n/a	n/a
Willing to distribute syringes for free to PWID	0.83	1.00	0.14	7.33	**<0.001**
Attitudes (behavioral beliefs) towards providing syringes					
Over the counter sale of syringes is good	0.88	1.00	0.00	n/a	n/a
Free distribution of syringes is good	0.92	1.01	0.07	14.64	**<0.001**
Will encourage drug use	0.52	0.58	0.07	8.14	**<0.001**
Will impact safety of staff	0.45	0.42	0.06	6.91	**<0.001**
Stigma towards PWID					
HU harm families	0.73	1.00	0.00	n/a	**<0.001**
Heroin users (HU) have no future	0.86	1.66	0.15	11.08	**<0.001**
HU are bad parents	0.63	0.92	0.09	10.86	**<0.001**
HU harm society	0.77	1.32	0.13	10.57	**<0.001**
Social conservatism scale					
Penalty for sex work	0.90	1.00	0.00	n/a	n/a
Arranged marriage	0.58	0.60	0.07	8.16	**<0.001**
Youth to obey seniors	0.54	0.52	0.07	7.74	**<0.001**
Hijab for all women	0.70	0.72	0.08	8.71	**<0.001**
Penalty for same-sex sex	0.66	0.78	0.08	9.32	**<0.001**
Religion is important for me	0.54	0.50	0.07	7.68	**<0.001**
Association between the latent factors					
Stigma on social conservatism	0.35	0.25	0.05	4.61	**<0.001**
Attitudes on stigma	-0.21	-0.33	0.13	-2.54	**0.011**
Attitudes on social conservatism	0.11	0.12	0.09	1.43	0.153
Behavioral intent on social conservatism	-0.25	-0.24	0.08	-3.14	**0.002**
Behavioral intent on attitudes	0.47	0.41	0.08	5.46	**<0.001**
Behavioral intent on stigma	-0.19	-0.26	0.12	-2.26	**0.024**
Covariate					

Latent factors and indicators	Standar-dized coeff. (STDYX)	Unstan-dardized coeff.	Standard error (SE) for unstan-dardized coeff.	Unstan-dardized coeff./SE	p-value
'Will impact safety of staff' (attsyr9) with 'Will encourage drug use' (attsyr6)	0.28	0.27	0.07	3.94	**<0.001**
'Heroin users (HU) harm families' (st10) with 'HU harm society' (st5)	0.33	0.17	0.05	3.70	**<0.001**
'Youth to obey seniors' (sc7) with 'Arranged marriage' (sc10)	0.30	0.20	0.05	3.79	**<0.001**
'Hijab for all women' (sc13) with 'Penalty for sex work' (sc9)	-0.63	-0.23	0.06	-3.91	**<0.001**
Proportion of variance explained (R^2) for dependent latent factors	**Two-tailed estimate**	**S.E**	**Est./S.E.**		**P-Value**
Behavioral intent	0.37	0.07	5.22		**<0.001**
Attitudes	0.04	0.03	1.34		0.180
Stigma	0.12	0.05	2.64		**0.008**

Table 3.6 Proportion of variance explained (R^2) of observed variables for Tajikistani students (n=240)

Items	Two-Tailed Estimate	S.E.	Est./S.E.	p-value
Behavioral intent				
Willing to sell syringes to PWID without prescription	0.530	0.078	6.815	<0.001
Willing to distribute syringes to PWID for free	0.681	0.089	7.644	<0.001
Attitudes towards provision of syringes to PWID				
Over the counter sale is good	0.769	0.049	15.694	<0.001
Free distribution of syringes is good	0.849	0.049	17.333	<0.001
Will encourage drug use*	0.266	0.053	5.010	<0.001
Will impact safety of staff*	0.200	0.050	4.000	<0.001
Stigma against PWID				
HU harm families	0.531	0.057	9.328	<0.001
HU have no future	0.730	0.055	13.181	<0.001
HU harm society	0.399	0.061	6.572	<0.001
HU are bad parents	0.594	0.055	10.738	<0.001
Social conservatism				
Penalty for sex work	0.801	0.066	12.127	<0.001
Arranged marriage	0.342	0.059	5.799	<0.001
Youth to obey seniors	0.286	0.055	5.161	<0.001
Hijab for all women	0.483	0.074	6.555	<0.001
Penalty for same-sex sex	0.431	0.059	7.288	<0.001
Religion is important for me	0.288	0.056	5.11	<0.001

Table 3.7. Additional results of the final model testing for Tajikistani pharmacy students (n=240)

Intercepts	Standar-dized coeff. (STDYX)	Unstan-dardized coeff.	Standard error (SE) for unstan-dardized coeff.	Unstan-dardized coeff./SE	p-value
Willing to sell syringes to PWID without prescription (bi2)	2.43	3.18	0.09	36.94	<0.001
Willing to distribute syringes to PWID for free (bi3)	2.50	2.88	0.08	37.84	<0.001
Over the counter sale is good (attsyrev1)	2.28	2.83	0.08	35.07	<0.001
Free distribution of syringes is good (attsyrev2)	2.24	2.68	0.08	34.58	<0.001
Will encourage drug use* (attsyr6)	2.02	2.47	0.08	31.02	<0.001
Will impact safety of staff* (attsyr9)	2.01	2.04	0.07	30.93	<0.001
HU harm families (st5)	4.63	4.40	0.06	71.62	<0.001
HU have no future (st6)	2.87	3.86	0.09	44.47	<0.001
HU harm society (st10)	4.16	4.21	0.07	64.33	<0.001
HU are bad parents (st11)	3.38	4.01	0.08	52.20	<0.001
Penalty for sex work (sc9)	3.65	4.03	0.07	54.80	<0.001
Arranged marriage (sc10)	4.12	4.15	0.07	62.42	<0.001
Youth to obey seniors (sc7)	4.45	4.24	0.06	67.15	<0.001
Hijab for all women (sc13)	3.93	4.04	0.07	59.88	<0.001
Penalty for same-sex sex (sc5)	3.32	3.91	0.08	49.89	<0.001
Religion is important for me (sc11)	4.47	4.09	0.06	66.37	<0.001
Variances					
Social Conservatism	1	0.98	0.13	7.26	<0.001
Residual variances					
Willing to sell syringes to PWID without prescription	2.43	0.81	0.13	6.12	<0.001
Willing to distribute syringes to PWID for free	2.50	0.42	0.12	3.68	<0.001
Over the counter sale is good	2.28	0.36	0.07	4.98	<0.001
Free distribution of syringes is good	2.24	0.22	0.07	3.17	0.002
Will encourage drug use*	2.02	1.10	0.11	10.42	<0.001
Will impact safety of staff*	2.01	0.82	0.08	10.56	<0.001
HU harm families	4.63	0.42	0.05	8.38	<0.001
HU have no future	2.87	0.49	0.10	5.11	<0.001
HU harm society	4.16	0.62	0.07	9.18	<0.001
HU are bad parents	3.38	0.57	0.08	7.66	<0.001
Penalty for sex work	3.65	0.24	0.08	3.08	0.002
Arranged marriage	4.12	0.67	0.07	9.55	<0.001
Youth to obey seniors	4.45	0.65	0.07	10.03	<0.001
Hijab for all women	3.93	0.55	0.08	6.96	<0.001
Penalty for same-sex sex	3.32	0.79	0.09	9.00	<0.001
Religion is important for me	4.47	0.60	0.06	9.82	<0.001

Latent variables					
Behavioral Intent	0.63	0.58	0.12	4.89	<0.001
Attitudes	0.96	1.14	0.15	7.78	<0.001
Stigma	0.88	0.42	0.07	5.93	<0.001

References

Abdul-Quader, A. S., Feelemyer, J., Modi, S., Stein, E. S., Briceno, A., Semaan, S., . . . Des Jarlais, D. C. (2013). Effectiveness of structural-level needle/syringe programs to reduce HCV and HIV infection among people who inject drugs: a systematic review. *AIDS and Behavior, 17*(9), 2878-2892.

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion, 2*(2), 113-133.

Balfour, L., Corace, K., Tasca, G. A., Best-Plummer, W., MacPherson, P. A., & Cameron, D. W. (2010). High HIV knowledge relates to low stigma in pharmacists and university health science students in Guyana, South America. *International Journal of Infectious Diseases, 14*(10), e881-e887.

Bandalos, D., & Finney, S. (2010). Factor analysis: Exploratory and confirmatory. In G. Hancock & R. O. Mueller (Eds.), *The reviewer's guide to quantitative methods in the social sciences* (pp. 93-114). New York, NY: Routledge.

Beardsley, K., & Latypov, A. (2012). *Policy Analysis and Advocacy Decision Model for HIV-Related Services: People Who Inject Drugs.* Retrieved from Washington, DC:

Blumenthal, W. J., Springer, K. W., Jones, T. S., & Sterk, C. E. (2002). Pharmacy student knowledge, attitudes, and beliefs about selling syringes to injection drug users. *Journal of the American Pharmacists Association, 42*(6s2), S34-S39.

Boymatov, A. (2015, May 2, 2015). [Personal Communication].

Brener, L., Hippel, W. V., Kippax, S., & Preacher, K. J. (2010). The role of physician and nurse attitudes in the health care of injecting drug users. *Substance use & misuse, 45*(7-8), 1007-1018.

Brener, L., & Von Hippel, W. (2008). Measuring attitudes toward injecting drug users and people with hepatitis C. *Substance use & misuse, 43*(3-4), 295-302.

Carey, M. P., & Schroder, K. E. (2002). Development and psychometric evaluation of the brief HIV Knowledge Questionnaire. *AIDS education and prevention: official publication of the International Society for AIDS Education, 14*(2), 172.

Clay, R., Terrizzi, J. A., Jr., & Shook, N. J. (2012). Individual differences in the behavioral immune system and the emergence of cultural systems. *Social Psychology, 43*(4), 174-184. doi:10.1027/1864-9335/a000118

Coffin, P. O., Linas, B. P., Factor, S. H., & Vlahov, D. (2000). New York City pharmacists' attitudes toward sale of needles/syringes to injection drug users before implementation of law expanding syringe access. *Journal of Urban Health, 77*(4), 781-793.

Ding, L., Landon, B. E., Wilson, I. B., Wong, M. D., Shapiro, M. F., & Cleary, P. D. (2005). Predictors and consequences of negative physician attitudes toward HIV-infected injection drug users. *Archives of Internal Medicine, 165*(6), 618-623.

Dutta, A., Wirtz, A. L., Baral, S., Beyrer, C., & Cleghorn, F. R. (2012). Key harm reduction interventions and their impact on the reduction of risky behavior and HIV incidence among people who inject drugs in low-income and middle-income countries. *Current Opinion in HIV and AIDS, 7*(4), 362-368.

Eades, C. E., Ferguson, J. S., & O'Carroll, R. E. (2011). Public health in community pharmacy: a systematic review of pharmacist and consumer views. *BMC Public Health, 11*(1), 582.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8*(3), 430-457.

Government of Tajikistan. (2015). *UNGASS Country Progress Report, 2015*. Retrieved from http://www.unaids.org/sites/default/files/country/documents/TJK_narrative_report_2015.pdf

Gudykunst, W. B., Gao, G., Schmidt, K. L., Nishida, T., Bond, M. H., Leung, K., . . . Barraclough, R. A. (1992). The Influence of Individualism Collectivism, Self-Monitoring, and Predicted-Outcome Value on Communication in Ingroup and Outgroup Relationships. *Journal of Cross-Cultural Psychology, 23*(2), 196-213. doi:10.1177/0022022192232005

Henningham, J. (1996). A 12-item scale of social conservatism. *Personality and Individual Differences, 20*(4), 517-519.

Ibragimov, U. (in progress-a). Pharmacists' stigmatization of people who inject drugs (PWID) in Tajikistan: sociocultural context and implications for promoting prevention services.

Ibragimov, U. (in progress-b). Structural equation modelling of pharmacists' attitudes and practices about selling sterile syringes to people who inject drugs in Tajikistan.

Janoff-Bulman, R., & Carnes, N. C. (2013). Surveying the moral landscape moral motives and group-based moralities. *Personality and Social Psychology Review*, 1088868313480274.

MacArthur, G. J., van Velzen, E., Palmateer, N., Kimber, J., Pharris, A., Hope, V., . . . Goldberg, D. (2014). Interventions to prevent HIV and hepatitis C in people who inject drugs: a review of reviews to assess evidence of effectiveness. *International Journal of Drug Policy, 25*(1), 34-52.

Mashburn, J. H. (2003). *Using the theory of planned behavior to predict Texas community pharmacists' willingness to provide sterile syringes to known or suspected intravenous drug users (Doctoral dissertation)*.

Matheson, C., Bond, C. M., & Mollison, J. (1999). Attitudinal factors associated with community pharmacists' involvement in services for drug misusers. *Addiction, 94*(9), 1349-1359.

Ministry of Health of Tajikistan. (2014). *Results of sentinel surveillance among injecting drug users in Tajikistan, 2014*. Retrieved from

Montano, D. E., & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health behavior and health education: Theory, research, and practice, 4*, 67-95.

Newsom, J. (2012). Some clarifications and recommendations on fit indices. *USP, 655*, 123-133.

Nguyen, E., Chen, T. F., & O'Reilly, C. L. (2012). Evaluating the impact of direct and indirect contact on the mental health stigma of pharmacy students. *Social psychiatry and psychiatric epidemiology, 47*(7), 1087-1098.

Otiashvili, D., Latypov, A., Kirtadze, I., Ibragimov, U., & Zule, W. (2016). Drug preparation, injection, and sharing practices in Tajikistan: a qualitative study in Kulob and Khorog. *Substance abuse treatment, prevention, and policy, 11*(1), 1-8. doi:10.1186/s13011-016-0065-2

Palamar, J. J., Kiang, M. V., & Halkitis, P. N. (2011). Development and psychometric evaluation of scales that assess stigma associated with illicit drug users. *Substance use & misuse, 46*(12), 1457-1467.

Palmateer, N., Kimber, J., Hickman, M., Hutchinson, S., Rhodes, T., & Goldberg, D. (2010). Evidence for the effectiveness of sterile injecting equipment provision in preventing hepatitis C and human immunodeficiency virus transmission among injecting drug users: a review of reviews. *Addiction, 105*(5), 844-859.

Patten, S. B., Remillard, A., Phillips, L., Modgill, G., Szeto, A. C., Kassam, A., & Gardner, D. M. (2012). Effectiveness of contact-based education for reducing mental illness-related stigma in pharmacy students. *BMC medical education, 12*(1), 120.

Rich, J. D., Martin, E. G., Macalino, G. E., Paul, R. V., McNamara, S., & Taylor, L. E. (2002). Pharmacist support for selling syringes without a prescription to injection drug users in Rhode Island. *Journal of the American Pharmacists Association, 42*(6s2), S58-S61.

Scott, J., & Mackridge, A. J. (2009). Pharmacy support staff involvement in, and attitudes towards, pharmacy-based services for drug misusers. *International journal of pharmacy practice, 17*(6), 325-332.

Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*(3), 248-279.

Taussig, J., Junge, B., Burris, S., Jones, T. S., & Sterk, C. E. (2002). Individual and structural influences shaping pharmacists' decisions to sell syringes to injection drug users in Atlanta, Georgia. *Journal of the American Pharmacists Association, 42*(6s2), S40-S45.

Tilson, H., Aramrattana, A., Bozzette, S., Celentano, D., Falco, M., Hammett, T., . . . Schottenfeld, R. (2007). *Preventing HIV infection among injecting drug users in high-risk countries: an assessment of the evidence*.

Velicer, W. F. (1976). Determining the number of components from the matrix of partial correlations. *Psychometrika, 41*(3), 321-327.

Watson, T., & Hughes, C. (2012). Pharmacists and harm reduction: a review of current practices and attitudes. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada, 145*(3), 124-127. e122.

Wodak, A., & Cooney, A. (2004). *Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users*. Retrieved from Geneva: http://www.who.int/entity/hiv/pub/prev_care/effectivenesssterileneedle.pdf?ua=1

Zule, W. A., Otiashvili, D., Latypov, A., Bangel, S., & Wechsberg, W. (2017). Gender disparities in HIV prevalence and risk behaviors among people who inject drugs in Tajikistan. *Drug & Alcohol Dependence, 171*, e225. doi:10.1016/j.drugalcdep.2016.08.614

Chapter 5: Summary and Conclusions

Introduction

People who inject drugs (PWID) in Tajikistan are disproportionately affected by the HIV and HCV epidemics, with prevalence rates reaching 26.5% and 29% accordingly among this population in select urban areas (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014; Zule, Otiashvili, Latypov, Bangel, & Wechsberg, 2017). High risk of these infections can be partly attributed to the limited access to clean needles and syringes, an important part of an effective prevention response (Government of Tajikistan, 2015; Ministry of Health of Tajikistan, 2014). At the same time, existing community-based needle and syringe program (NSP) service outlets cannot fully meet PWID's demand for injection equipment in the country (Otiashvili, Latypov, Kirtadze, Ibragimov, & Zule, 2016). Therefore, PWID buy sterile syringes from pharmacies if NSP are closed or their services are not available in the area. Although NSP services operate legally within the National AIDS Program, policies regulating pharmacies are vague regarding prescription-free sales of syringes, leaving this decision to pharmacists' discretion. Qualitative data indicates that Tajikistani pharmacists may refuse to sell syringes to PWID or mistreat them, thus limiting their access to this service (Ibragimov, Latypov, Jamolov, & Khasanova, 2011; Otiashvili et al., 2016). While global literature indicates that pharmacists' attitudes, including stigmatization of PWID, play an important role in influencing their decisions to sell syringes to PWID (Coffin, Linas, Factor, & Vlahov, 2000; Eades, Ferguson, & O'Carroll, 2011; Matheson, Bond, & Mollison, 1999; Rich et al., 2002; Taussig, Junge, Burris, Jones, & Sterk, 2002; Watson & Hughes, 2012), no studies on this topic have been conducted in Tajikistan or in any other Central Asian countries. This dissertation research aimed to explore processes and meanings of stigmatization of PWID by

pharmacists and pharmacy students and test a comprehensive theory-driven model explaining pharmacists' syringe sale practices and attitudes towards PWID. In addition, we tested a separate model of factors influencing willingness to provide syringes to PWID among pharmacy students, who may have different attitudes and beliefs regarding the issue as compared to practicing pharmacists.

Summary of Key Findings

This dissertation applies qualitative (thematic analysis of individual interviews) and quantitative (structural equation modelling of syringe purchase attempts and survey data) methods to examine pharmacists' and pharmacy students' attitudes and practices towards provision of syringes to PWID in the Dushanbe and Kulob cities of Tajikistan.

Our key findings by chapter are as follows:

In **Chapter 2** we identified several sub-themes related to stigma and discrimination of PWID by pharmacists and pharmacy students that are aligned with Link and Phelan's conceptualization of stigma (Link & Phelan, 2001; Link, Yang, Phelan, & Collins, 2004). We found that pharmacists and students assign PWID labels with negative connotations; hold negative stereotypes about them (e.g. PWID commit crimes and aggression, are irresponsible parents, harm their families and society); and express negative emotional reactions (especially fear) toward PWID.

Pharmacists and students enacted stigma via isolation, rejection, ostracism and discrimination of PWID. Specifically, stigma was one of the main drivers of pharmacists' refusal to provide syringes to PWID. Perceiving PWID as sinners, fearing crime and aggression, considering PWID as individuals who choose to destroy their own lives, families and society, pharmacists saw provision of syringes as abetting moral transgression and crime. Participants often cited the religious ban on drug use as the reason to refuse to sell syringes to PWID. At the same time, some religious participants

disagreed with ostracizing PWID and were in favor of provision of syringes to protect fellow Muslims from negative consequences of drug use. Still, we found that because of stigma pharmacists may be reluctant to participate in the provision of syringes to PWID even if they acknowledge its utility in preventing an HIV epidemic. Finally, policy-related structural factors, including legislation on aiding and abetting drug use, vague policies related to selling syringes without prescription and the unsupportive position of the state pharmacy monitoring and law enforcement agencies also played an important role in fueling negative attitudes and enacting stigma against PWID.

In **Chapter 3**, we found that a majority of sampled pharmacists agreed to sell syringes without prescription, indicating relatively high accessibility of OTC syringes. Bivariate analysis showed that those who agreed to sell syringes were more likely to be from Dushanbe, have lower drug controllability beliefs, higher HIV and drug dependency knowledge, lower level of stigma, more positive attitudes towards provision of syringes and more willingness to provide syringes to PWID.

According to the final model (Figure 5.1), **agreeing to sell syringes** was *positively* associated with the reported **intent to provide syringes** without prescription and higher level of **social conservatism** (after accounting for the mediating effect of stigma), and *inversely* with **stigma against PWID**. **Intent to provide syringes** *directly* correlated with **positive attitudes towards provision of syringes**, which in turn were *inversely* associated with **stigma against PWID** and *directly* with **age**. **Stigma against PWID** was *directly* associated with **social conservatism** and *inversely* with **university-level education**. The model explained about a third of stigma factor variance, although for other dependent latent factors this estimate was lower.

In **Chapter 4** we found that in accordance with the final model (Figure 5.2), students' **intent to provide syringes to PWID** *positively* correlated with favorable

attitudes towards provision of syringes to PWID, and *negatively* with **stigma against PWID** and **social conservatism**. **Attitudes towards provision of syringes** were *negatively* associated with **stigma against PWID**. **Stigma** also *positively* correlated with **social conservatism**. The model explained a relatively high proportion of **behavioral intent** variance.

Accessibility of syringes in pharmacies

Our findings show that sterile syringes can be purchased in most pharmacies in Dushanbe and Kulob, suggesting that PWID can potentially purchase syringes without prescription in Tajikistani cities. At the same time, our findings should not be interpreted as indicating the absence of any barriers towards obtaining syringes by PWID. PWID may still lack money to buy syringes, especially after they have spent all their money for purchasing heroin. Police surveillance or mistreatment by pharmacists may also reduce motivation of PWID to visit pharmacies to buy clean syringes (Ibragimov et al., 2011; Otiashvili et al., 2016). Finally, our syringe purchase audit may not fully capture the actual experiences of PWID who visit pharmacies (see Strengths and Limitations section).

Stigma and access to syringes in pharmacies

Both qualitative and quantitative assessments of pharmacists' and pharmacy students' attitudes and practices demonstrate the central role of stigma in shaping pharmacists' decisions to sell syringes. Qualitative data shows that pharmacists may refuse to sell syringes to PWID since the former perceive drug use as a sinful and harmful activity. Negative stereotypes of PWID as individuals prone to crime and aggression trigger fear as the main emotional response and thus reduce pharmacists' willingness to interact with PWID. Similar findings were described for pharmacists in other countries (Coffin

et al., 2000; Eades et al., 2011; Matheson et al., 1999; Rich et al., 2002; Taussig et al., 2002; Watson & Hughes, 2012). Our data suggest that stigma may influence pharmacists' behavior indirectly by triggering negative attitudes towards the idea of providing syringes to PWID, which in turn reduces their intent to provide syringes. The direct inverse link between stigma and syringe selling intent and practice suggests that pharmacists or students who stigmatize PWID may refuse to sell syringes even if they have no negative beliefs regarding the outcomes of selling syringes to PWID.

Notably, the quantitative component of our study distinguishes between the stigmatizing attitudes towards PWID and attitudes towards provision of syringes. We found that while these two constructs correlated in both models, the correlation was modest, suggesting that stigma against PWID and attitudes towards provision of syringes and other harm reduction services are similar, but not identical concepts. This point is missing in the previous literature on pharmacists' and other service providers' attitudes towards PWID (see, e.g. Matheson, Bond, & Tinelli, 2007; Rich et al., 2002; Scott & Mackridge, 2009; Taussig et al., 2002), precluding direct comparison of our findings with those of other studies.

The role of contextual and background factors

Our qualitative study showed that pharmacists and students tend to explain stigmatizing attitudes towards PWID by religious prohibition of drug use. At the same time, we note that the religion of Islam should not be construed as a factor primarily responsible for stigma against PWID. Rather, we argue that it is overarching conservative social and moral norms of the patriarchal and collectivistic society of Tajikistan that shape stigmatizing attitudes towards PWID. Our modelling results showed that social conservatism is directly associated with stigmatization of PWID both in the pharmacists

and students sample. At the same time, the direct positive association between social conservatism and pharmacists' agreeing to sell syringes upon controlling for stigma is puzzling. A possible explanation may be that the link between social conservatism and actual syringe practices may be due to some unaccounted factor, such as pragmatism. We also found the direct *inverse* association between social conservatism and students' intent to provide syringes after controlling for stigma. It may be that some of the socially conservative students who do not feel stigma against PWID still refuse provision of syringes to PWID because of collectivistic conformity to prevailing social norms condemning drug use. This difference in the relationship between social conservatism and syringe sale behavior (actual or intended) in pharmacists and students may be due to different professional pharmacy experience of these two populations, as suggested by our qualitative findings. Possibly, work in pharmacies makes the pharmacists more pragmatic towards selling syringes without prescription as compared to the students who may have only a hypothetical understanding of this behavior. Our general conclusion that stigma is linked to social conservatism and collectivism is supported by the global literature (Altemeyer & Hunsberger, 1992; Brener, Hippel, Kippax, & Preacher, 2010; Clay, Terrizzi, & Shook, 2012; Gudykunst et al., 1992; Janoff-Bulman & Carnes, 2013; Sibley & Duckitt, 2008).

While we were not able to assess the role of HIV- and drug-related knowledge in our final models, our findings from bivariate analysis suggest that knowledge may influence stigmatization of PWID, negative attitudes towards providing them syringes and actual syringe sale practices. The link between service providers' knowledge and attitudes towards PWID and other marginalized populations has also been shown in past literature (Andrewin & Chien, 2008; Balfour et al., 2010; Ding et al., 2005; Feyissa, Abebe, Girma, & Woldie, 2012; Waluyo, Culbert, Levy, & Norr, 2014).

Applicability of IBM/TPB

Our pharmacists' model demonstrated the viability of the link between actual behavior, behavioral intent and attitudes, as predicted by IBM/TPB theoretical framework (Montano & Kasprzyk, 2008). Similarly, the students' model supported the theoretical claim about association between the attitudes toward the behavior and behavioral intent. However, we could not test models that included perceived norms and self-efficacy constructs of IBM/TPB. Further testing of this framework in the context of selling syringes to PWID in Tajikistan should involve more work on validating measures related to the omitted constructs. Inclusion of additional constructs (e.g. pragmatism) could also improve utility of the model in explaining pharmacists' syringe sale behaviors.

Practical Implications

We found that syringes can be accessible for purchase without prescription in the majority of pharmacies in Dushanbe and Kulob. Nevertheless, PWID may still face barriers to accessing sterile syringes in pharmacies. The role of attitudes towards PWID and towards provision of syringes to them as predictors of syringe sale practices highlight the need for educational and advocacy interventions targeting pharmacists and pharmacy students. Training should also be accompanied by support from pharmacy owners and colleagues (Ford, Bammer, & Becker, 2009), and in the case of Tajikistan, from National Pharmacy Monitoring Center staff. These activities should be informed by theory-driven interventions that have been demonstrated effective in reducing stigma among service providers towards marginalized populations (Nguyen, Chen, & O'Reilly, 2012; Patten et al., 2012). To address the religious concerns of syringe provision opponents, the intervention developers should look at the experience of other Muslim

countries where harm reduction initiatives were promoted based on Islamic principles of protection of life, health and wellness of fellow Muslims (Kamarulzaman & Saifuddeen, 2010). Taking into account the role of socially conservative and collectivistic values in shaping stigma, the intervention should focus on emphasizing practical advantages of harm reduction for PWID, their families and the society and on changing participants' perceptions of social norms related to drug use. Educational and advocacy intervention should be delivered to practicing pharmacists via collaboration with the National Pharmacy Monitoring Service and local community-based AIDS-service organizations. Pharmacy students can be targeted by introducing the training program on HIV and substance abuse to the curriculum of the Pharmacy Department of the Medical University.

Educational interventions need to be accompanied by relevant policy reforms, such as introducing provisions unambiguously mandating selling syringes without prescription, and specifying that harm reduction activities cannot be interpreted as aiding and abetting drug use.

Strengths and Limitations

Our study featured several strengths. We combined qualitative and quantitative methodology that allows for triangulating findings and offsetting shortcomings of each methodology. Thus, qualitative findings helped to adapt measures and respecify models in the quantitative component, while quantitative findings confirmed (or refuted) propositions made based on qualitative results. In addition, qualitative data helped explain some of our unexpected findings.

In addition, each component had its specific strengths. We linked actual behavior and survey data to verify objectively self-reported data. Audio-recording and verbatim transcription of the interviews and analysis of data by the native of Tajikistan fluent in local languages and knowledgeable of the local socio-cultural context enhances the descriptive and interpretative validity of our qualitative findings(Maxwell, 1992). Probability-based sampling of pharmacies increases generalizability of our findings to pharmacies in Dushanbe and Kulob. Administering the survey via CASI helps to reduce social desirability bias. Use of structural equation modeling helps to assess the mediation properties of the key constructs as well as account for potential measurement error.

Limitations of the quantitative components of the study include a lack of previously validated measures and the relatively small sample size. Due to the cross-sectional nature of the quantitative analyses, we cannot establish temporal or causal relationships within the models. The validity of the syringe purchase audit may also be limited since it was not conducted by actual PWID; available data suggests that pharmacists may tend to discriminate against PWID who repeatedly visit the same pharmacies, are known as PWID in the neighborhood or ask for credit when purchasing the syringes (Ibragimov et al., 2011; Otiashvili et al., 2016). The study results may also have limited generalizability to rural areas of Tajikistan.

Directions for Future Research

This was the first theory-driven study of pharmacists' and pharmacy students' attitudes and practices related to syringe provision in Central Asia. We were the first to demonstrate the link between stigma against PWID, attitudes towards provision of syringes and actual syringe provision practices. To advance our knowledge on

improving the accessibility of syringes by addressing pharmacists' stigma and discrimination of PWID, and on ensuring the effectiveness of pharmacy-based syringe distribution in reducing HIV risk, the following studies are needed:

Intervention development

The most significant gap in knowledge is the absence of effective interventions promoting provision of syringes and other harm reduction services among service providers in the context of Central Asia. A study that involves developing and testing the efficacy of theory-driven educational and stigma-reducing interventions targeting pharmacists in Tajikistan is needed to address this gap. Intervention development should also include further validation of measures such as knowledge or self-efficacy that did not fit into our final models.

Access to syringes and HIV risk

Tracking changes in the accessibility of syringes by syringe purchase audits and surveying PWID on the accessibility of syringes in pharmacies can help to assess the effectiveness of harm reduction promotion initiatives among the pharmacists. A study of the relationship between geospatial distribution of HIV prevalence among PWID, their risky injecting practices and the accessibility of syringes in pharmacies can provide strong evidence of the linkage between the accessibility of syringes and biological outcomes (see, e.g. Cooper et al., 2012; Fedorova et al., 2013).

Qualitative studies among other stakeholders

Access of PWID to syringes depends not only on pharmacists' attitudes, but also on attitudes and practices of the state pharmacy monitoring and law enforcement agencies, as well as on religious leaders' position on harm reduction. The first step should involve the qualitative study of the meanings and processes of stigmatization of PWID by these

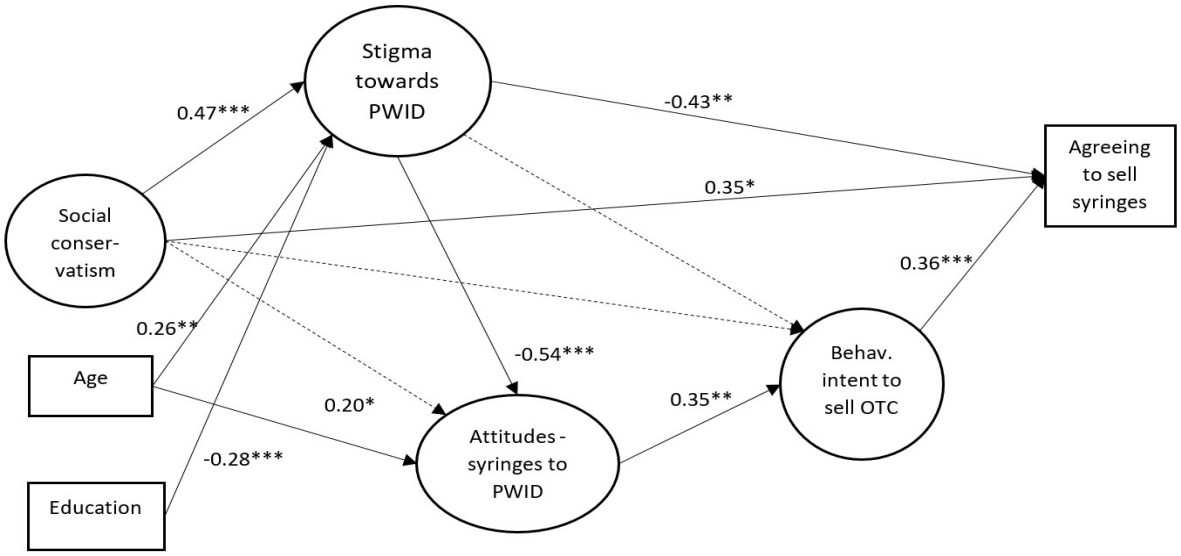
stakeholders.

Conclusion

This dissertation study enhances knowledge on the linkage between contextual factors, stigma against PWID, attitudes towards provision of syringes and actual syringe sale practices in Tajikistan. Our findings have important practical implications for the national AIDS response. We argue for the need for educational and advocacy activities targeting pharmacy service providers and for policy reforms to ensure accessibility of syringes for PWID. Future studies should adapt and test theory-driven interventions, assess the link between the accessibility of syringes and HIV risk and explore the attitudes of other stakeholders towards PWID and harm reduction services.

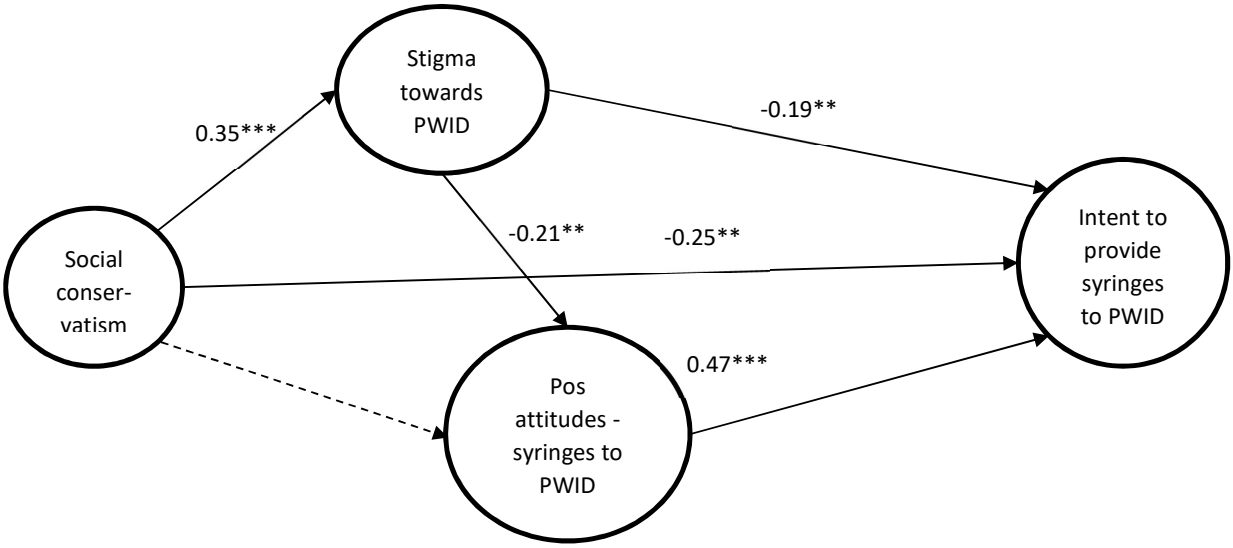
Figures

Figure 5.1 Final structural model of Tajikistani pharmacists' syringe sale practices



* p<0.05, ** p<0.01, *** p<0.001

Figure 5.2. Final structural model of Tajikistani pharmacy students' willingness to provide syringes to PWID



* p<0.05, ** p<0.01, *** p<0.001

References

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *The International Journal for the Psychology of Religion, 2*(2), 113-133.

Andrewin, A., & Chien, L.-Y. (2008). Stigmatization of patients with HIV/AIDS among doctors and nurses in Belize. *AIDS patient care and STDs, 22*(11), 897-906.

Balfour, L., Corace, K., Tasca, G. A., Best-Plummer, W., MacPherson, P. A., & Cameron, D. W. (2010). High HIV knowledge relates to low stigma in pharmacists and university health science students in Guyana, South America. *International Journal of Infectious Diseases, 14*(10), e881-e887.

Brener, L., Hippel, W. V., Kippax, S., & Preacher, K. J. (2010). The role of physician and nurse attitudes in the health care of injecting drug users. *Substance use & misuse, 45*(7-8), 1007-1018.

Clay, R., Terrizzi, J. A., Jr., & Shook, N. J. (2012). Individual differences in the behavioral immune system and the emergence of cultural systems. *Social Psychology, 43*(4), 174-184. doi:10.1027/1864-9335/a000118

Coffin, P. O., Linas, B. P., Factor, S. H., & Vlahov, D. (2000). New York City pharmacists' attitudes toward sale of needles/syringes to injection drug users before implementation of law expanding syringe access. *Journal of Urban Health, 77*(4), 781-793.

Cooper, H., Des Jarlais, D., Ross, Z., Tempalski, B., Bossak, B. H., & Friedman, S. R. (2012). Spatial access to sterile syringes and the odds of injecting with an unsterile syringe among injectors: A longitudinal multilevel study. *Journal of Urban Health, 89*(4), 678-696.

Ding, L., Landon, B. E., Wilson, I. B., Wong, M. D., Shapiro, M. F., & Cleary, P. D. (2005). Predictors and consequences of negative physician attitudes toward HIV-infected injection drug users. *Archives of Internal Medicine, 165*(6), 618-623.

Eades, C. E., Ferguson, J. S., & O'Carroll, R. E. (2011). Public health in community pharmacy: a systematic review of pharmacist and consumer views. *BMC Public Health, 11*(1), 582.

Fedorova, E. V., Skochilov, R. V., Heimer, R., Case, P., Beletsky, L., Grau, L. E., . . . Shaboltas, A. V. (2013). Access to syringes for HIV prevention for injection drug users in St. Petersburg, Russia: syringe purchase audit study. *BMC Public Health, 13*(1), 183.

Feyissa, G. T., Abebe, L., Girma, E., & Woldie, M. (2012). Stigma and discrimination against people living with HIV by healthcare providers, Southwest Ethiopia. *BMC Public Health, 12*(1), 522.

Ford, R., Bammer, G., & Becker, N. (2009). Improving nurses' therapeutic attitude to patients who use illicit drugs: workplace drug and alcohol education is not enough. *International Journal of Nursing Practice, 15*(2), 112-118.

Government of Tajikistan. (2015). *UNGASS Country Progress Report, 2015*. Retrieved from http://www.unaids.org/sites/default/files/country/documents/TJK_narrative_report_2015.pdf

Gudykunst, W. B., Gao, G., Schmidt, K. L., Nishida, T., Bond, M. H., Leung, K., . . . Barraclough, R. A. (1992). The Influence of Individualism Collectivism, Self-Monitoring, and Predicted-Outcome Value on Communication in Ingroup and

Outgroup Relationships. *Journal of Cross-Cultural Psychology, 23*(2), 196-213. doi:10.1177/0022022192232005

Ibragimov, U., Latypov, A., Jamolov, P., & Khasanova, E. (2011). *Needs assessment among opiate users in Dushanbe-city in 2010: the qualitative assessment.* Retrieved from Dushanbe, Tajikistan:

Janoff-Bulman, R., & Carnes, N. C. (2013). Surveying the moral landscape moral motives and group-based moralities. *Personality and Social Psychology Review*, 1088868313480274.

Kamarulzaman, A., & Saifuddeen, S. (2010). Islam and harm reduction. *International Journal of Drug Policy, 21*(2), 115-118.

Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual review of Sociology*, 363-385.

Link, B. G., Yang, L. H., Phelan, J. C., & Collins, P. Y. (2004). Measuring mental illness stigma. *Schizophrenia bulletin, 30*(3), 511-541.

Matheson, C., Bond, C. M., & Mollison, J. (1999). Attitudinal factors associated with community pharmacists' involvement in services for drug misusers. *Addiction, 94*(9), 1349-1359.

Matheson, C., Bond, C. M., & Tinelli, M. (2007). Community pharmacy harm reduction services for drug misusers: national service delivery and professional attitude development over a decade in Scotland. *Journal of public health, 29*(4), 350-357.

Maxwell, J. (1992). Understanding and validity in qualitative research. *Harvard educational review, 62*(3), 279-301.

Ministry of Health of Tajikistan. (2014). *Results of sentinel surveillance among injecting drug users in Tajikistan, 2014*. Retrieved from

Montano, D. E., & Kasprzyk, D. (2008). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health behavior and health education: Theory, research, and practice, 4*, 67-95.

Nguyen, E., Chen, T. F., & O'Reilly, C. L. (2012). Evaluating the impact of direct and indirect contact on the mental health stigma of pharmacy students. *Social psychiatry and psychiatric epidemiology, 47*(7), 1087-1098.

Otiashvili, D., Latypov, A., Kirtadze, I., Ibragimov, U., & Zule, W. (2016). Drug preparation, injection, and sharing practices in Tajikistan: a qualitative study in Kulob and Khorog. *Substance abuse treatment, prevention, and policy, 11*(1), 1-8. doi:10.1186/s13011-016-0065-2

Patten, S. B., Remillard, A., Phillips, L., Modgill, G., Szeto, A. C., Kassam, A., & Gardner, D. M. (2012). Effectiveness of contact-based education for reducing mental illness-related stigma in pharmacy students. *BMC medical education, 12*(1), 120.

Rich, J. D., Martin, E. G., Macalino, G. E., Paul, R. V., McNamara, S., & Taylor, L. E. (2002). Pharmacist support for selling syringes without a prescription to injection drug users in Rhode Island. *Journal of the American Pharmacists Association, 42*(6s2), S58-S61.

Scott, J., & Mackridge, A. J. (2009). Pharmacy support staff involvement in, and attitudes towards, pharmacy-based services for drug misusers. *International journal of pharmacy practice, 17*(6), 325-332.

Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review, 12*(3), 248-279.

Taussig, J., Junge, B., Burris, S., Jones, T. S., & Sterk, C. E. (2002). Individual and structural influences shaping pharmacists' decisions to sell syringes to injection

drug users in Atlanta, Georgia. *Journal of the American Pharmacists Association, 42*(6s2), S40-S45.

Waluyo, A., Culbert, G. J., Levy, J., & Norr, K. F. (2014). Understanding HIV-related Stigma Among Indonesian Nurses. *Journal of the Association of Nurses in AIDS Care*.

Watson, T., & Hughes, C. (2012). Pharmacists and harm reduction: a review of current practices and attitudes. *Canadian Pharmacists Journal/Revue des Pharmaciens du Canada, 145*(3), 124-127. e122.

Zule, W. A., Otiashvili, D., Latypov, A., Bangel, S., & Wechsberg, W. (2017). Gender disparities in HIV prevalence and risk behaviors among people who inject drugs in Tajikistan. *Drug & Alcohol Dependence, 171*, e225. doi:10.1016/j.drugalcdep.2016.08.614