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Individual, Social, and Structural Factors Affecting Antiretroviral Therapy Adherence among HIV-positive People Who Inject Drugs in Kazakhstan

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Abstract

Background: HIV-infected people who inject drugs (PWID) are particularly vulnerable to suboptimal ART adherence. The fastest-growing HIV epidemics globally are driven by injection drug use, but only a small percentage of HIV-positive PWID have achieved viral suppression. Virally suppressed individuals have better HIV-related health outcomes and effectively no risk of transmitting HIV to others. Hence, ART adherence is important for both HIV treatment and HIV prevention. There is a paucity of data on barriers and facilitators of ART adherence among PWID in low and middle income countries, which is problematic given the growing HIV epidemics among PWID in these countries.

Methods: Using the Theory of Triadic Influence, this paper examines individual, interpersonal, and structural barriers and facilitators of ART adherence among HIV-positive PWID in four cities in Kazakhstan. Eight focus groups were conducted (two in each city) with a total of 57 participants. Data were coded and analyzed by three researchers.

Results: We found a number of barriers and facilitators to ART adherence among PWID at the individual, interpersonal, and structural levels. Individual barriers to ART adherence include misperceptions about ART, forgetfulness due to the effects of illicit drug use, and medication side effects. Interpersonal facilitators of ART adherence include social support and good relationships

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with healthcare providers. Structural barriers include poverty, legal challenges, disruptions in the ART supply, and stigma and discrimination.

Conclusion: The paper highlights important factors related to ART adherence for HIV-positive PWID and identifies potential strategies for intervention efforts, including couple-based interventions, electronic reminders, linkage to drug treatment services, and patient navigation. Effectively enhancing adherence to ART among PWID will likely require multi-level approaches and strategies. Further research should be conducted on potential methods and interventions for improving ART adherence among this vulnerable population.

Keywords

people who inject drugs; HIV; adherence; antiretroviral therapy

INTRODUCTION

Injection drug use is the primary mode of HIV transmission throughout many areas of the world, including Eastern Europe and Central Asia, Southeast Asia, the Middle East, and Latin America.(Mathers et al., 2008) People who inject drugs (PWID) are disproportionately less likely to receive antiretroviral therapy (ART) than other people living with HIV (PLWH) who do not inject drugs.(Bobrova, Sarang, Stuikeyte, & Lezhentsev, 2007; IHRD, 2006; D Wolfe, 2007) Research suggests that doctors may delay or withhold ART from PWID, believing PWID are incapable of adhering to ART and will develop viral resistance as a result of inconsistent adherence.(McNairy, Deryabina, Hoos, & El-Sadr, 2013; D. Wolfe, Carrieri, & Shepard, 2010) However, evidence indicates that, with appropriate support, PWID can achieve the same levels of adherence to and clinical benefit from ART as HIV-positive individuals who do not use drugs,(Malta, Magnanini, Strathdee, & Bastos, 2010; Malta, Strathdee, Magnanini, & Bastos, 2008; Wood et al., 2008) and that PWID have no greater odds of developing viral resistance than other HIV-positive populations.(Werb, Mills, Montaner, & Wood, 2010) Given this, the World Health Organization (WHO) recommends that physicians not withhold ART medication on the basis of current or former injection drug use status.(World Health Organization, 2006)

Eastern Europe and Central Asia (EECA) has some of the highest injection drug use rates in the world,(United Nations Office on Drugs and Crime (UNODC), 2016) and it is the only region globally where both HIV prevalence and HIV incidence are increasing,(UNAIDS, 2016) driven primarily by injection drug use.(Mathers et al., 2008) In Kazakhstan, over half of HIV-infected individuals acquired their infection parenterally through injection drug use. (Kazakhstan Republican AIDS Center, 2015) It is estimated that 56.3% of all PLWH in Kazakhstan are PWID and 8.2% of PWID in Kazakhstan have HIV.(Kazakhstan Republican AIDS Center, 2015) Of the 9078 HIV-positive PWID in Kazakhstan, only 2797 (31%) receive ART, and of those, only 1331 (40%) are virally suppressed, indicating significant adherence problems.(The Republican AIDS Center, 2015)

PWID in Kazakhstan face several barriers that may prevent them from adhering to ART, such as stigma and discrimination, criminalization and incarceration, poverty, and violence. (Terlikbayeva et al., 2013)

In Kazakhstan, HIV care is provided in specialized AIDS Centers. AIDS Centers are administratively and physically separate from primary care clinics and other medical facilities, and contain departments for clinical treatment, laboratory services, epidemiological monitoring, and prevention activities. Local residency is required to receive services at AIDS centers. HIV testing, treatment, and prevention services are provided free to all Kazakhstani citizens, financed by national and local budgets (approximately 80%) and international organizations (approximately 20%), such as the Global Fund.(Baiserkin et al., 2016) ART medications are only available through AIDS Centers, not in primary care clinics or pharmacies. Originally, only those with CD4 counts below 350/mL were eligible for treatment; in January 2017, individuals with CD4 counts below 500/mL became eligible, and in May 2017, Kazakhstan began providing ART to all confirmed cases of HIV, regardless of CD4 count.

Given its proximity to Afghanistan, Kazakhstan experiences a significant amount of drug trafficking, and consequently, drug abuse.(Yusopov et al., 2012) Heroin is the most common type of drug injected in Kazakhstan.(United Nations Office on Drugs and Crime, 2010) Injection drug use has historically been treated through detoxification programs, which remain a primary treatment method to this day.(Boltaev, Deryabina, Kusainov, & Howard, 2012) Detoxification clinics provide in-patient detoxification and medications for long-term treatment using opioid antagonists. However, opioid substitution therapy is limited. Methadone programs are present in some cities and have been found effective in reducing drug use and HIV risk behaviors, but a lack of resources limits the number of clients these programs are able to serve.(Boltaev et al., 2012) Political pressure and a lack of public support have complicated efforts to expand and sustain methadone programs throughout the country, thus, limiting their impact.(Boltaev et al., 2012)

Since 2009, Kazakhstan has used a registry system for PWID, which is maintained by regional drug treatment clinics. PWID may register voluntarily, or may be compelled to register by law enforcement, local government or medical organizations.(Yusopov et al., 2012) Registration is required to receive drug treatment services, but many PWID fear that registering will expose them to targeting by law enforcement, and to discrimination in housing, employment, or other services. Under Kazakh law, drug abuse is not a criminal offence. However, according to Article 336–2 of the Code of Administrative Responsibility, ‘non-medical’ use of drugs in public places is an administrative offence and is punishable by a fine, with higher fines for repeated acts. Individuals who have been arrested for these acts twice within a year are placed in administrative detention.(European Monitoring Centre for Drugs and Drug Addiction, 2015) Kazakhstan has also legislated measures for compulsory treatment of drug addicts.(European Monitoring Centre for Drugs and Drug Addiction, 2015) Previous studies have found that PWID in Kazakhstan have been harassed by police on the streets or while accessing HIV and drug prevention and treatment services.(El-Bassel, Gilbert, et al., 2013; El-Bassel, Strathdee, & El-Sadr, 2013) Such interference by law enforcement could significantly inhibit PWID from accessing important and necessary services, such as drug treatment and ART.

Despite high rates of HIV infection and low rates of viral suppression among PWID in Kazakhstan, there has been alarmingly little research conducted on ART adherence among

PWID in Kazakhstan. Most of the research on ART adherence among PWID has been conducted in high income countries or in areas where rates of HIV infection among PWID are comparatively low.(Malta et al., 2010) Studies on barriers and facilitators to ART adherence among HIV-positive PWID in low and middle income countries (LMIC) are sparse.(Malta et al., 2010; D. Wolfe et al., 2010) This is concerning given that the largest HIV epidemics among PWID occur in LMIC, such as those in Central Asia.(Mathers et al., 2008) Over the coming years, HIV-positive PWID from LMIC will constitute a growing proportion of ART recipients as treatment roll-out progresses.(SA Strathdee & JA Stockman, 2010) Studies on barriers and facilitators to ART initiation and adherence are urgently needed to inform efforts to expand ART use in regions where HIV rates are high and ART initiation and adherence are low among PWID.(Malta et al., 2010) Qualitative methods are crucial to identify the individual, interpersonal, and structural factors that either inhibit or promote HIV-positive PWID's adherence to ART medications. This paper contributes to filling these gaps in the literature.

The purpose of this paper is to examine perceived barriers and facilitators to ART adherence among PWID in Kazakhstan. The paper explores how multi-level factors, such as access to services, social norms and stigmas, attitudes toward and emotions regarding ART, and personal behaviors, influence ART adherence. We used a qualitative research approach, which is appropriate for exploratory work examining complex, multilevel phenomena such as those related to medication adherence.(Gwadz et al., 2016) The individual perspectives and personal experiences of HIV-positive PWID in Kazakhstan revealed both the complex social realities that undermine their adherence to ART and the diverse ways in which they navigate these challenges.

METHODS

Theoretical Framework

We used the Theory of Triadic Influence as a guide for analyzing barriers and facilitators of ART adherence for PWID in this paper.(Flay, Snyder, & Petraitis, 2009) The Theory of Triadic Influence posits that three “streams of influence” act simultaneously to affect health behaviors: the individual level (e.g., perceptions about ART; substance use and uptake of drug treatment services; and co-morbidities), interpersonal level (e.g., relations with healthcare providers; social support; and peer norms around ART adherence), and structural level (e.g. logistics of healthcare settings, such as their location and hours of operation; ability to access services for co-occurring conditions; and policies impeding the provision of ART). The Theory of Triadic Influence guided the selection of domains to explore in this paper. It highlights the interplay of multilevel factors that influence health behavior, rather than solely focusing on individual-level factors, which may be the most visible factors impeding or facilitating ART adherence, but are not always the most salient.(Gwadz et al., 2016)

Participants

Eight focus groups were conducted in four cities (Almaty, Karaganda, Temirtau, and Shymkent) in Kazakhstan between May and June 2016. Participants in the focus groups

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were recruited through flyers distributed to AIDS Centers, needle-exchange programs, outreach workers, and non-governmental organizations (NGOs) that work with PWID and PLWH. Each city in Kazakhstan has an AIDS Center, where all HIV-positive individuals in the city are treated for HIV. Outreach workers work at needle-exchange programs to help link PWID to harm reduction services. Between three and nine PWID participated in each focus group, for a total of 57 participants, 32 women and 25 men. Two focus groups were all female, two focus groups were all male, and four focus groups were mixed gender. To be included in the study, participants had to: (1) be at least 18 years of age, (2) have injected drugs in the past year, (3) have been diagnosed H V-positive, and (4) fluently speak Russian.

Procedures

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All research procedures were approved by Institutional Review Boards at Columbia University and the Kazakhstan School of Public Health. Prior to the start of the focus group, participants met individually with the research assistant in a private room, where the research assistant explained all study procedures and obtained written informed consent from the participants. Focus groups were facilitated by trained research staff at the Global Health Research Center of Central Asia (GHRCCA), who have been conducting research among PWID and PLWH in Kazakhstan for the past decade. Focus groups were conducted in private rooms at the GHRCCA field offices, city AIDS centers, or NGOs. AIDS Center staff were not present in any of the focus groups nor did they receive any data from the focus groups. They only provided a confidential space for the focus groups to be conducted in instances where a suitable alternate location was not available. Participants were informed that their data would not be shared with AIDS Center staff. To maintain confidentiality and promote truthful answers to socially sensitive questions, participants were encouraged to use and refer to each other by their first name only. Focus group discussions lasted approximately 1 ½ to 2 hours. All focus groups were digitally recorded and transcribed verbatim into Russian, then translated into English for analysis. No personally identifiable information was contained in the transcripts or translations. Focus group questions followed a guide with core questions and prompts that were grounded in the domains of the Theory of Triadic Influence, covering specific topics relating to (1) participants' history with ART adherence and continuation or discontinuation, (2) experiences obtaining ART from the AIDS Center, (3) perspectives on factors that impede or facilitate adherence to ART, probing for individual, interpersonal, and structural levels of influence, (4) attitudes toward ART, and (5) emergent themes. The relationship of substance use to these topics was also explored. Participants were reimbursed \$10 for travel and time.

Data Analysis

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We used thematic analysis to analyze transcripts.(Guest, MacQueen, & Namey, 2011) Data were analyzed using NVIVO (version 11, Doncaster, Australia). First, the research team developed a set of preliminary descriptive codes based on an initial review of the transcripts and the domains of the theoretical model (e.g. attitudes towards ART, stigma, relationships with providers, peer norms). Then, a trained qualitative analyst coded each focus group transcript using these codes, refining and creating additional codes when necessary. We conducted a reliability check of the coding in which 25% of the transcripts were independently coded by two other qualitative analysts to establish inter-coder reliability and

further refine the existing set of codes.(Neuendorf, 2002) Discrepancies in coding were resolved by consensus. Excerpts were selected to illustrate the main findings and expand upon the selected themes.

RESULTS

Overview

Study findings illuminated relationships between ART adherence and substance use among HIV-positive PWID in Kazakhstan. A total of 57 participants participated – 32 women and 25 men. The majority (n=42; 73.7%) of participants were of Russian ethnicity. Participants ranged in age from 18–59, with the majority of participants between the ages of 30–49 (n=48; 84.2%). All participants had injected heroin, and this was the primary illicit drug being used. Participants' ranges of views and experiences can be broadly organized into the following domains based on the Theory of Triadic Influence: individual level barriers and facilitators, interpersonal level barriers and facilitators, and structural level barriers and facilitators. All names used below are pseudonyms.

Individual level barriers and facilitators

Misperceptions about ART—Misperceptions or mistrust about ART were widespread among the PWID community. Some participants felt strongly that ART would worsen their health and that natural home remedies were more effective than ART treatment.

“It’s better to heal with herbs like your grandparents and you don’t need any pills. You need to eat carrots. I have already lost all of my relatives, but I’m holding on. You need to eat all types of orange foods.” – Alena, 29 year old female in Almaty

Many PWID in general often have a deep mistrust of the healthcare system or people in positions of authority due to the high levels of stigma and discrimination they frequently experience.(Islam, Topp, Day, Dawson, & Conigrave, 2012) This theme also emerged in PWID views of ART. A number of participants stated that some PWID in their networks were convinced that ART is a plot to kill injection drug users, and thus refused to adhere to ART medication.

“There are some people who start ART, have side effects, and then say, ‘The AIDS Center has put us on this medicine to kill us all so that we don’t reproduce.’ Then they stop taking ART.” – Irina, 34 year old female in Almaty

Drug use and ART adherence—All participants were active PWID and reported injecting heroin. Number of participants acknowledged that drug use impeded ART medication adherence. They cited forgetfulness associated with drug or alcohol use as a key barrier to ART adherence.

“If you have a normal lifestyle, then taking ART treatment and being adherent is not so difficult. If you don’t have a normal lifestyle – you drink alcohol and use drugs – then it’s a little more complicated. People are more adherent to drugs than to ART. They need to change their lifestyle or approach.” – Rustam, 45 year old male in Shymkent

However, a number of other participants stated that, even with drug use, it was possible for individuals to adhere to ART medication. Several participants described how they were able to adhere to their medication regimens despite their injection drug use by leveraging different strategies, such as alarm clocks and social support.

Medication Assisted Therapy (MAT)—Although participants recognized that injection drug use impeded their adherence to ART medication and complicated their HIV treatment, many held negative views about MAT and were hesitant to enter MAT programs. Participants held many misperceptions about MAT, including the belief that methadone is more addictive than heroin. Other participants identified barriers to accessing MAT. Several participants worked and were unable to attend the MAT clinic to receive methadone, either because they worked during the clinic's hours of operations or because they were frequently required to travel out of town for work and worried about withdrawals. Participants were concerned about asking for time off or an alternate work schedule in order to attend the MAT clinic, as they were afraid of disclosing their status as a PWID. Most participants had never accessed MAT, but those who had expressed their displeasure with the program.

“Earlier I visited the program and worked. The schedule was not bad. I came at 6am, drank methadone, and went to my work. But now there are limited hours when you can come. I have to work and can't come at that time. So I started heroin again. It's easier to find it, inject, and go to work. The dose will be waiting for me. I know that when I wake up in the morning, can inject and go to work. But no one will give me methadone at 6am, therefore, I can't stay in this program.”— Evgeniy, 44 year old male from Temirtau

None of the participants who had previously accessed MAT reported that it improved their ART adherence. However, these participants did not have good adherence to their MAT programs, which may be why there was not a noticeable effect on adherence. Some participants stated that they thought MAT programs would help improve adherence.

“I think MAT would improve ART adherence. Adherence depends on your lifestyle and style of thinking. Your lifestyle is getting better when you are on MAT, you have no criminal problems, and you can work. By changing your lifestyle, you start to think about your health and ART adherence, so you are more likely to improve.”— Ruslan, 45 year old male from Shymkent

Side effects of ART and medication schedules—Side effects were one of the most frequently cited reasons for ART non-adherence or discontinuation. The high prevalence of side effects may be due to low quality of generic ART drugs or the fact that some ART regimens in Kazakhstan contain azidothymidine (AZT). Many participants stated that they had experienced side effects to ART, such as nausea, insomnia, and liver problems, and that despite changing medication regimens, side effects had not improved. Some participants expressed a sense of hopelessness with their ART regimens and were ready to give up taking their medication.

“I feel bad. I really don't sleep for days. And [the AIDS Center] says to me that they've already changed my regimen, that now only one regimen remains, and if

that one doesn't work, then what? The [side effects] with the first regimen also happened with the second. 'Be patient,' they say to me. But how long can you be patient?'" – Irina, 34 year old female in Almaty

Other participants expressed unhappiness about taking pills for the rest of their lives. Many felt that the need to take pills every day for the remainder of their lives was too burdensome for them to maintain.

"In the early days I woke in the morning and said that all other people began their day normally with a cup of coffee, but start my day with pills. But at least woke up alive, even with pills. But now, oh, no, no, I can't. I already can't. As soon as I see those pills, I've had enough. I can't take them anymore." – Marina, 37 year old female in Almaty

Interpersonal level barriers and facilitators

Social support—Participants emphasized the role of social support in facilitating adherence to ART. Social support for medication adherence was received through several different types of relationships, including intimate partners, family, friends, and formal support groups. In particular, participants cited intimate partner support as a key facilitator of ART adherence. A number of participants stated that their intimate partners provided them with much needed social support in managing their HIV status, saying that intimate partners often reminded them to take their ART medications on time; some partners even calling to make sure participants had taken their medications. One participant stated:

"Oh, our sexual partners are good. They do not interfere [with ART adherence]... On the contrary, [sexual partners] remind you to take your medication. If they are not at home, they will call and ask if you took your medication." – Marina, 37 year old female in Almaty

Some participants talked about the role that family can play in providing support for ART adherence, but many acknowledged that stigma from family members could also inhibit ART adherence or receipt of appropriate treatment for HIV. Lack of familial support appeared to be more prevalent in smaller cities or rural areas.

"Family is also a double-edged sword. On the one hand, if you truly have a loving family, then they will accept you and there is no better support than that of a family. But because of our [local] mentality, it can be exactly opposite. A separate mug, and sometimes separate housing even a different city for you! It's especially difficult in rural areas to find family understanding, and if you're a woman it's practically impossible." – Rustam, 45 year old male in Shymkent

Participants spoke highly of social support groups. These groups are run through regional AIDS Centers or NGOs and are held weekly or monthly. Participants emphasized the role social support groups played in helping them access and adhere to ART medications and cope with their HIV status, particularly in cases where they lacked intimate partners or other social support networks.

"Regarding social support groups, new people come and they receive information and support. In my situation, these groups played a very positive role. Before

started attending them, it was very, very hard for me.” – Yuri, 53 year old male in Shymkent

Participants who lacked social support discussed how difficult it was to adhere to ART medications or cope with their HIV status on their own. Lack of social support emerged as a significant barrier to ART initiation and adherence.

“Now I’m 33 years old and needed [ART medications] long ago, but I don’t know what the future will be, especially given my way of life. I have no mother or person to be near who will look after me and see that I took my medications...And I cannot take care of myself like that. Because of this I don’t want to take medication.” – Alena, 33 year old female in Almaty

Relationships with healthcare providers—For most participants, the quality of their relationships with their healthcare providers played a crucial role in determining whether they were willing to adhere to ART treatment and to seek HIV care. Participants reported being substantially more willing to access HIV care when they perceived their providers as respectful and caring, and when they felt that providers genuinely listened to their concerns and gave them necessary and accurate information about ART. Being able to speak openly about injection drug use and be treated non-judgmentally were also listed as positive aspects of participants’ HIV care experiences and as important facilitators of continuing to seek HIV care.

“The first time I went to the AIDS Center, cried. I’m sitting there and they gave me the results of the analysis [HIV test] on paper and I’m sitting there crying. I had so many tears I couldn’t lift my eyes, that’s how sat. And there were [my friends] and the nurse. They said, ‘Stop, calm down. [HIV-positive] people can live happily and everything will be okay.’” – Marina, 37 year old female in Almaty

Participants reported that their positive experiences with medical staff at the AIDS Center served as a primary motivator to access care there. Some reported that medical staff provided needed emotional support they weren’t receiving from their family or friends. Participants related stories about good nurses who remembered their patients’ names, treated them professionally, and even inquired about and remembered other problems in their lives. Participants noted that a good relationship with a healthcare provider facilitated their adherence to ART and helped them remember to refill their prescriptions on time by calling when it was time for them to refill. Some healthcare providers even home-delivered ART medications, which enabled participants to easily obtain medications and maintain adherence.

“I can call my nurse and tell her that I am out of medications. I don’t even need to go to the AIDS Center, she will bring them to my home. Honestly, the medical staff here are good.” – Oleg, 51 year old male in Karaganda

Other participants noted how negative experiences with healthcare workers at AIDS Centers could serve as a barrier to accessing or continuing with HIV care and ART. In some situations, stigma or discrimination by healthcare providers may not be intentional. In some circumstances, healthcare providers were trying to be friendly and welcoming, but their

overenthusiasm resulted in a loss of patient confidentiality and served as a disincentive for patients to receive further care from the AIDS Center.

“There is a sort of friendly negligence among our AIDS Center doctors. It hampers [access to care]. Many different people come to the AIDS Center, not just drug users. But if you are registered there as a PWID, they mark you out of the others. They say, “Oh, hi! Here you are at last! Glad to see you!” thus, showing other people [you are a drug user] and [people] look askance at you. Therefore, I say that friendly negligence hampers [HIV care]. It’s connected to confidentiality” – Julia, 34 year old female in Temirtau

Outside of the AIDS Center, most participants reported negative experiences receiving health care services, particularly in polyclinics or hospitals. Several participants expressed frustration over stigma they faced for being HIV positive.

“I was already HIV-positive when I was giving birth to my second child. When I was first admitted to the hospital, I didn’t tell them I was HIV-positive, but told them later. They moved all of the other women giving birth out of the ward. Then, they put a sign on the ward – “HIV” – and told all of the other birth mothers not to go into that ward anymore. Can you imagine my position? There was the corridor and at the end of the corridor was the ward and was there alone.” – Anna, 40 year old woman from Almaty

It should be noted that this particular incident and some other experiences of stigma and discrimination experienced by participants occurred years ago and attitudes towards HIV-positive individuals are becoming more accepting. However, although the AIDS Center provides training on stigma and discrimination for medical workers, negative attitudes and discrimination towards HIV-positive individuals still persist among some healthcare providers. As seen in other studies, (Gwadz et al., 2016; Wolfe, 2007) some of this discrimination is manifest in the hesitancy of some physicians to prescribe ART to patients because they were injection drug users.

“I don’t know what underground tunnels they [healthcare providers] received their medical diplomas in. I helped a friend that had tuberculosis and needed to immediately start ART. We went to the AIDS Center. He was ready to start ART. He came from the doctor and said, “The doctor said I don’t need to start ART.” The doctor was a new doctor. I went to her and said, “Why? He has tuberculosis!” She said to me, “He drinks and injects drugs.” I said to her, “So what? Then you should explain to him the pros and cons and provide consultation.” She didn’t understand. I created a scandal and went to the director and explained. He said, “Well, we’ll reprimand her.” But [my friend] had already left. The doctors told me to bring him again. I said, “After a medical doctor told him he doesn’t need to take ART, I, as a social worker, will have no standing in his eyes.” – Ruslan, 45 year old male in Shymkent

Structural level barriers and facilitators

Broad stigma and discrimination—Although employment discrimination based on HIV-status is officially considered illegal in Kazakhstan, nonetheless, cases of individuals

losing their jobs once their HIV status is disclosed are still common and many who lose their jobs lack legal recourse. A few of our participants had heard of cases where an individual's HIV-status was unintentionally disclosed to an employer because they were taking ART. Some feared taking ART because of these stories.

"I read on the Internet about a young man who was taking ART and went on a long field placement for work and ran out of ART medication. He couldn't tell anyone at work, they couldn't give him more ART, and he died. here are many of these examples. Because of that, I don't take ART. I'm afraid." – Tatyana, 35 year old female in Karaganda

Others reported fearing harassment from the police. While some participants said that police attitudes towards and interactions with PWID and HIV-positive individuals has improved from earlier years, other participants reported that the police still discriminate against HIV-positive individuals and PWID.

"[Police] are biased against HIV-positive men and women. I talked to a policeman about another person. The policeman didn't know that I'm HIV-positive and was very scornful about that other person and called him a [derogatory term]." – Vasiliy, 49 year old male in Almaty

However, in terms of ART adherence, participants did not report the police as a significant barrier to adherence. Rather, they were more concerned that by accessing treatment at the AIDS Center, their HIV-status would be disclosed to acquaintances resulting in additional stigma and discrimination. One participant stated,

"No, [fear of going to the AIDS Center] is not because of the police. It's because one of your acquaintances could see you. I always go there with dark sunglasses on." – Irina, 50 year old female in Almaty

Another participant also discussed her fear of family members discovering her HIV-status when she accesses care at the AIDS Center.

"Yes, students go there for testing. My daughter studies at the university. And here I am! 'What are you doing here, Mom?', she will ask. She doesn't know that I'm registered there." – Aliya, 40 year old female in Almaty

Difficult life circumstances—All of our participants openly discussed the role poverty played in limiting their access to HIV care and their adherence to HIV medications. Lack of housing, employment, and financial and social support were substantial concerns in the lives of a number of PWID. An inability to meet these significant needs served as a major barrier to ART adherence.

"[There was one time when] I had no money, no place to live, nothing. The only thing I had were the ART pills in my pocket. I stood on the bridge and thought, 'Why do I need this therapy if I have such a life?' And I threw my pills into the water. I thought it was better to die. I didn't take ART for two months, then injected one time and began to think sensibly and started ART again. When basic needs are not met, than what good is this therapy? No housing, no food, and when you take pills, you need to eat normally." – Aleksey, 51 year old male in Shymkent

Participants often had little means of coping with their difficult life situations, thus driving them to further drug use. Given their circumstances, ART adherence was often a low priority in comparison to other more pressing needs, such as finding food or housing.

“I’m homeless, a bum, and disabled. And how can I find work with TB and HIV? Sometimes they won’t accept me in public places, even in temporary shelters. And there are many like me. And they bring new clients to the AIDS Center – they infect others because there is nowhere to live... The majority die because they have difficult lives.” – Grigori, 48 year old male, Shymkent

Treatment for co-morbidities—Some of our participants reported co-morbid TB or Hepatitis C infections. Participants expressed great frustration at siloed healthcare systems and a complicated process of navigating health care. Several participants recounted experiences where they had to go back and forth multiple times between healthcare facilities to provide the appropriate documentation necessary to receive care and medications. The significant amount of time and effort needed to obtain appropriate treatment, particularly for those who had co-morbid conditions, was a barrier to adhering to medication regimens. The majority of participants desired a healthcare system that was interconnected and easier to navigate.

“Sometimes it seems to me that healthcare providers live in the Stone Age. Now we have text messaging, email, scanners, etc. TB and HIV are connected. Is it really impossible to have some kind of connection between the AIDS Center and the TB dispensary?” – Irina, 50 year old woman in Imaty.

Legal barriers to ART—Access to free ART treatment in Kazakhstan is contingent upon citizenship and proper documentation. This means that external migrants, particularly those who are illegally residing in the country, and internal citizens without proper documentation find it extremely challenging to access ART treatment. Some participants stated that they shared their ART medications with other HIV-positive individuals who could not access it because of their legal status.

“I have an acquaintance who doesn’t have an identification card. He was released from prison not long ago and he’s HIV-positive. They do not give him pills. He can’t be linked to care. His wife is HIV-positive as well. Sometimes I miss taking pills, so they accumulate and I give them to him. They know that he’s HIV-positive, but they won’t give him ART because they require identification.” – Volodya, 49 year old male in Almaty

Problems with ART medication supply—Another problem, one which is also largely connected to side effects, is the lack of sufficient ART regimens in Kazakhstan. One participant stated, “They have very few drug regimens to select at the AIDS Center. There are many drug regimens in the world, but few in Kazakhstan.” Participants believed that a lack of available ART regimens was a reason why patients were kept on a particular medication regimen, even in the presence of severe and chronic side effects. Other participants were concerned about the quality of ART drugs.

“Recently, there’s another problem – the substitution of brand name medications for generic ones. When I took the original medications, felt so wonderful that I even forgot I was HIV-positive. As soon as they started to give me generics – first one, then another, and that’s all. I became half a person.” – Irina, 50 year old female in Almaty

DISCUSSION

Past research has investigated barriers to ART adherence among HIV-positive PWID. However, research on this topic has been scarce among PWID in LMIC countries, especially in Central Asia.(Malta et al., 2010) This is of great concern given that the fastest growing HIV epidemics among PWID have recently taken place in transitional and developing countries like Kazakhstan.(Mathers et al., 2008; S Strathdee & J Stockman, 2010) This qualitative study addresses this gap in the literature by providing a rich description of barriers and facilitators to ART adherence among PWID in Kazakhstan. The Theory of Triadic Influence illustrates how individual-, interpersonal- and structural-level barriers and facilitators impact ART adherence and HIV care.

At the individual level, our results indicate that side effects of ART medication regimens are a major barrier to ART adherence. large number of patients in Kazakhstan remain on ART regimens that contain AZT, which may partially explain the high frequency of side effects in our sample. Much of the reason for continued prescription of older ART regimens was due to high procurement costs of newer ART medications in Kazakhstan.(Shattock et al., 2017) However, Kazakhstan has recently managed to reduce procurement prices for ART medications by using international procurement mechanisms, such as purchasing medications through UNICEF. With lower procurement costs, the Ministry of Health in Kazakhstan is actively expanding newer ART regimens in the country, which should reduce the side effects associated with ART. Additionally, we found that drug use interfered with medication adherence for some participants, but MAT was viewed negatively by many participants, including the few who had previously participated in an MAT program. There is evidence that PWID on MAT reduce their drug use, making it easier for them to adhere to medication schedules.(Malta et al., 2010; Malta et al., 2008; D Wolfe, 2007) However, much work remains to be done in Kazakhstan to increase knowledge and trust in MAT, alleviate patient concerns about taking MAT, enhance medical provider knowledge of MAT, and improve linkage and access to MAT services. Structural barriers, such as limited MAT clinic operating hours and the requirement to attend the clinic daily to receive methadone, severely impeded initiation of and adherence to MAT. Many of the PWID in our focus groups regularly traveled out of town for work, to visit family, or to go on vacation. The inability to access methadone during extended travel periods was a significant barrier to MAT uptake. Policy changes that extend MAT operating hours or that allow patients to take home a supply of methadone sufficient for several days or a week may result in a significant uptake in MAT services. Several participants stated that it was easier to stay on heroin than start methadone because of heroin’s greater accessibility. Implementing policies that allow for methadone prescriptions for several weeks or even several days may be a simple change that could dramatically increase MAT uptake among PWID. In addition, misinformation about MAT is

prevalent in Kazakhstan among both PWID and providers. Disseminating accurate information about MAT to both healthcare providers and PWID is needed.

At an interpersonal level, our results highlight the importance of social support in improving adherence to ART medication and coping with HIV status. Research has shown that social support can be crucial in improving ART adherence,(Avants, Margolin, Warburton, Hawkins, & Shi, 2001; Knowlton et al., 2006; Lucas, Cheever, Chaisson, & Moore, 2001; Palepu et al., 2006) and improving the overall support environment in which PWID receive treatment has been shown to be independently associated with adherence to ART.(Chaisson, Keruly, & Moore, 1995) The development and adaptation of evidence-based intervention strategies that utilize social support, such as couple-based interventions, may be an effective way of increasing ART adherence among PWID.(El-Bassel & Remien, 2011; Remien et al., 2005; Remien et al., 2006) Currently, there are no couple-based ART adherence interventions specifically for PWID, and this may be an important area for future research and program development.

Our results also show how ART adherence problems and poor engagement in HIV care cannot be separated from the larger context of poverty and stigma against HIV-positive individuals and PWID. Stigma, discrimination and marginalization within the community served to exacerbate the problems of insecure housing, lack of employment opportunities, and other forms of deprivation within this population, all of which complicate medication adherence and access to HIV care.(Allen, Wright, Harding, & Broffman, 2014; Levi-Minzi & Surratt, 2014) The number of participants who experienced stigma or discrimination by healthcare providers, particularly outside of the AIDS Center, was alarming. In addition, there were situations where some providers tried to be empathetic to participants' needs and context, but in doing so, unintentionally disclosed patient information. Depending on the extent to which these situations still occur, further training of healthcare providers in how to appropriately respond to and protect the confidentiality of HIV-positive PWID is likely warranted. Healthcare providers outside of the AIDS Center appear to be in particular need of additional training, as HIV-positive PWID need to access care not only in AIDS Centers, but also in other healthcare facilities when they are treated for conditions other than HIV. Policies should be implemented that require training on interacting with HIV-positive individuals for all healthcare providers, not only those working at AIDS Centers.

From a structural perspective, in Kazakhstan, as elsewhere in the former Soviet Union, medical treatment has historically been separated by discipline, with tuberculosis (TB) clinics, AIDS centers, and narcological (drug treatment) dispensaries claiming exclusive authority for treatment of their specialty.(D. Wolfe et al., 2010) Participants co-infected with TB and HIV reported the need to shuttle signed documents between the TB clinic and AIDS Center before they could receive care at either facility. Lack of communication and updated technology by healthcare facilities imposed substantial burdens on PWID seeking treatment, which constrained their ability to access appropriate care. Improving the connection between various healthcare facilities or creating a shared electronic patient database would streamline healthcare navigation and facilitate greater access to care. Although we expected police harassment to be a significant barrier to care, discrimination by police did not seem to have a significant effect on ART adherence or access to ART. (It should be noted, however, that

police harassment of PWID and HIV-positive individuals does still exist in Kazakhstan, but participants reported such harassment was more likely to occur on the street or near harm reduction facilities, such as at needle syringe programs.) Rather fear of HIV-status disclosure to acquaintances and family members when accessing care at AIDS Centers was a bigger impediment to adherence. To decrease the risk of inadvertent disclosure of HIV-status when accessing care, the development of alternate methods or venues of accessing ART medications may be warranted.

LIMITATIONS

One limitation of this study is that its purposive sampling method may limit its generalizability to the broader PWID population. A purposive sampling method, rather than random sampling, is fitting with the goals of qualitative research, which aims for depth rather than breadth. However, our qualitative sample was diverse in terms of gender, location, risk behaviors, and treatment access experiences. Another limitation is that participants often did not define the timeframe in which their experiences of stigma and discrimination occurred. Thus, it is difficult to determine the extent to which experiences of stigma and discrimination are currently occurring. Despite these limitations, this qualitative study offers insights into the needs and challenges faced by PWID in adhering to ART treatment.

CONCLUSION

This paper highlights a number of addressable barriers to ART adherence and engagement in HIV care for PWID in Kazakhstan. Findings suggest the need for interventions at the individual and/or couple level (utilizing facilitators of adherence, such as social support or alarm clocks, and decreasing substance use when possible), healthcare provider level (increasing skill and comfort treating HIV-positive PWID and reducing stigma and discrimination), healthcare system level (providing newer ART medication regimens, connecting HIV, TB, and substance abuse treatment services to facilitate patient navigation), and larger structural level (increasing stable housing and access to employment). Addressing adherence barriers faced by PWID will greatly help to increase viral suppression among this population, thus reducing or eliminating HIV transmission, and prevent the development of drug-resistant virus.

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