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Methadone Maintenance Treatment Decentralization in Vietnam

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Methadone Maintenance Treatment Decentralization in Vietnam

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by

Diep Bich Nguyen

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ABSTRACT OF THE DISSERTATION

Methadone Maintenance Treatment Decentralization in Vietnam

by

Diep Bich Nguyen

Doctor of Philosophy Epidemiology

University of California, Los Angeles, 2020

Professor Li Li, Chair

Background

To respond to the dual HIV and injecting drug use epidemic, Vietnam has implemented methadone maintenance treatment (MMT) nationwide since 2010 and decentralized it to primary care (i.e. commune health centers) since 2015. The study aims to explore the challenges that Vietnamese community health workers (CHW) at commune health centers encounter in providing MMT and the factors associated to these challenges.

Methods

This study had a mixed method design. We used two types of data in this study. For the sub-study 1, we used the secondary data from a quantitative survey conducted in Vinh Phuc and Phu

Tho provinces among 300 CHWs who did not provide MMT at the time of the study. For the sub-studies 2 and 3, we collected quantitative and qualitative primary data from Dien Bien province. We conducted a quantitative survey among 276 CHWs including both MMT providers and non-MMT providers. From this sample, we selected 26 MMT providers with various characteristics for in-depth interviews.

Results

In the sub-study 1, the mean score of CHWs' interaction with PWUD 36.4 (SD 8.8) on a scale of 60. The interaction between CHW not providing MMT and people who use drugs (PWUD) was negatively associated with their stigmatizing attitude towards PWUD (β = -0.84, 95% CL: -1.05; -0.63) after adjusting for their background (gender, education level, job position and years of working experience) and job-related characteristics (perceived risk and challenges when working with PWUD, job satisfaction and empathy towards PWUD). In the sub-study 2, 114 (41.3%) CHW had ever provided MMT services. Better MMT knowledge was associated with higher levels of confidence in providing MMT services among CHW who had no experience with MMT program (β=0.90, 95%CL: 0.29; 1.51), not among those who had experiences. On the other hand, technical support in working with PWUD was associated with a higher level of confidence in providing MMT services for both groups (β=0.71, 95%CL: 0.35; 1.08 and β=0.58, 95%CL: 0.19; 0.96 among CHWs who had ever and who had never worked in MMT, respectively). In sub-study 3, the perceived challenges for MMT provision included lack of confidence and motivation to provide MMT, inadequate human resource, lack of institutional support, insufficient technical support, lack of referral resources and additional support for patients, lack of policies to support the MMT program at CHCs and to protect service providers.

Conclusion

CHWs in Vietnam faced several challenges in working with PWUD and providing MMT services at primary care settings. Supportive policies and tailored interventions should be developed at different levels to ensure the quality and effectiveness of the MMT decentralization program.

The dissertation of Diep Bich Nguyen is approved.

Roger Detels

Steven Shoptaw

Chunqing Lin

Li Li, Committee Chair

University of California, Los Angeles

2020

To my dearest parents, husband, and daughters

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Abbreviations

ART	Antiretroviral Therapy
CASI	Computer-Assisted Self-Interview
CHC	Commune health centers
CHW	Community health workers
HIV	Human Immunodeficiency Virus
MAT	Medication-assisted treatment
MMT	Methadone Maintenance Treatment
MoH	Ministry of Health
OUD	Opioid use disorders
PCP	Primary care providers
PWID	People Who Inject Drugs
PWUD	People Who Use Drugs
PEPFAR	President's Emergency Plan for AIDS Relief
SUD	Substance use disorders
WHO	World Health Organization

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Chapter 1: Background

1.1 Methadone maintenance treatment in the world

Methadone maintenance treatment (MMT) was first implemented in 1960s in the United States and has become one of the most important treatments of opioid dependence (Joseph et al., 2000; WHO, 2017). Extensive literature has proved the effectiveness of MMT in reducing illicit opioid consumption and its related harm including mortality and criminality as well as increasing the quality of life of people who use drugs (PWUD) (Fullerton et al., 2014; Gowing et al., 2011; Mattick et al., 2009; Sun et al., 2015; Volkow et al., 2014). In 2005, the World Health Organization (WHO) official listed methadone among the essential medicines for substance use disorders (Herget, 2005). MMT is also an effective human immunodeficiency virus (HIV) prevention strategy as it reduces drug-related HIV risk behaviors and increases antiretroviral therapy (ART) uptake, adherence and treatment outcomes (Fullerton et al., 2014; Gowing et al., 2011; Low et al., 2016; Uhlmann et al., 2010).

MMT delivery models greatly vary around the world. Many countries apply strict administration requirement on methadone to prevent diversion due to the medication's ability to cause fatal overdose as a potent opioid agonist (Ward & Mattick, 1999). In the United States, methadone is highly controlled and only prescribed in special settings (Joseph et al., 2000). In 1995, however, the Institute of Medicine (IOM) raised a concern that the US federal regulations on methadone were hampering the expansion and accessibility of the treatment (Yarmolinsky & Rettig, 1995). Although research has showed methadone could be delivered effectively and safely in primary care, this practice is still not allowed in the US (Fiellin et al., 2001; Korthuis et al., 2017). In contrast, methadone treatment has been widely prescribed at primary care in other

countries like Switzerland, Scotland, Canada and Australia (Ahamad et al., 2015; Greenwood, 1996; Klingemann,1996; Krantz & Mehler, 2004; Nolan et al., 2015; Simoens et al., 2005; Weinrich & Stuart, 2000).

Different factors contribute to the effectiveness of MMT in primary care. Given the important role of medical providers in the treatment for substance use patients, primary care provider's interaction with patients that establishes trust in the relationship has been the most important ingredient (Lewis, 1997). Ward & Mattick (1999) maintain that "trained staff with positive attitudes toward MMT and opioid dependent patients" is one of the key components of effective methadone treatment. Negative emotions and inadequate training were found to be difficulties associated with drug treatment by general practitioners in Switzerland, where MMT has been available at primary care for over 20 years (Klingemann,1996; Pelet et al., 2005). Studies on successful implementation of MMT in primary care report a wide variety of factors, including providers' individual factors, patients and treatment contextual factors and structural barriers (Livingston et al., 2018; Schulte et al., 2013). Although different programs may vary substantially in their efficacy, MMT decentralization at primary care has largely contributed to reduce the public health burden of opioid dependence by delivering safe and effective maintenance treatment to many people in need (Farrell et al., 1994; Ward & Mattick, 1999).

1.2 MMT in the context of HIV epidemic in Vietnam

Being geographically close to the "Golden Triangle" region (including Laos, Myanmar, Thailand), Vietnam has a long history of opioid consumption. Opium was first imported into the North of Vietnam in the early 19th century and soon became popular in the whole country (Nguyen & Scannapieco, 2008). During the Vietnam War (1955 – 1975), heroin became a

serious problem in the South due to the large-scale consumption by American troops and Vietnamese soldiers. In 1986, with the introduction of Doi Moi (Renovation), Vietnam has undergone a profound social and economic change. The transition from a centrally planned to a market-oriented economic model has significantly changed Vietnam's drug market. From late 1990s, heroin was smuggled into Vietnam from neighboring countries and become dominant in the illicit drug market (Windle, 2015). While smoking was the preferred administration route in the mid-1990s when opium was the norm, injection became the more popular method in the early 2000s as heroin took over the market (Nguyen & Scannapieco, 2008). Most of the heroin users began their heroin use by smoking and then shift to injecting, as it was cheaper and brought the "high" quicker (Thao et al., 2006).

Since the first identified HIV case in 1990, the HIV epidemic in Vietnam has expanded rapidly, especially during late 1990s among people who inject drugs (PWID) (Hien et al., 2004; Quan et al., 2000). In Ho Chi Minh City where the first HIV case was identified, the prevalence of HIV among PWID rose dramatically from 1% in 1992 to 39% in 1996, compared with 1.2% among sex workers, 0.3% among blood donors and 1.3% among tuberculosis patients (Lindan et al., 1997). In 1996 – 1997, PWID represented 89% of all those for whom risk was reported in the national surveillance and HIV prevalence rates among PWID in some provinces were nearly 90% (Quan et al., 2000). The national HIV prevalence increased from 10.1% in 1996 to 32% in 2002 among PWID (Hien et al., 2004). Studies have explored HIV high-risk behaviors of PWID and HIV transmission patterns among PWIDs and from PWIDs to their non-using partners. All those studies reported the popularity of needle sharing and unprotected sex with multiple partners (Go et al., 2006b; Hien et al., 2004; Lam, 2008). Moreover, the majority of PWID did not disclose their HIV status with their injecting or sex partners (Go et al., 2006b). These high-

risk behaviors resulted in escalated HIV transmission among PWID and increased risks that HIV would spread into the general population (Go et al., 2006a; Hammett et al., 2007).

In responding to the HIV epidemic, the Government has gradually changed its policy toward drug use and PWUD (Nguyen Ha et al.; 2010; Vuong et al.; 2012). In early 1990s, illicit drug use was considered a "social evil" and a "dangerous social disease" (Government of Vietnam, 1992). A decade later, Vietnam has gradually shifted to harm reduction approach for HIV/AIDS vulnerable populations with strategies like peer education, needle and syringe distribution, and condom promotion (Nguyen Ha et al., 2010; Vuong et al., 2012; Windle, 2015). The HIV prevalence among all high-risk populations, especially among PWID as the predominant group, however, kept increasing, suggesting the need for more effective interventions (Hien et al., 2004). As the result, MMT was introduced in Vietnam in 2008 as an HIV prevention approach for PWID (Edington & Bayer, 2013; Nguyen et al., 2012).

1.3 MMT implementation in Vietnam

The success of the pilot MMT program in Haiphong and Ho Chi Minh City, two major urban areas, from 2008 – 210 has led to a large national scale-up of MMT in Vietnam (Hoang et al., 2015; Nguyen et al., 2012). The pilot data showed a dramatic reduction in illicit drug use and HIV incidence as well as decreased criminal activities and improved quality of life (FHI360, 2014). Vietnamese policymakers, being convinced not only of MMT's effectiveness in controlling the HIV epidemic but also of its significant social impact, approved the expansion plan proposed by the Ministry of Health (MoH) (Nguyen et al., 2012). By October 2019, MMT was available in 63 provinces in Vietnam with 335 clinics, serving 52,200 patients (Vietnam Ministry of Health (MoH), 2019). This number, however, only accounts for about 65% of the

government's 2015 target number of 80,000 patients in treatment. Meanwhile, overdose deaths, police arrests for drug-related crimes, side effects, and lack of motivation to continue treatment raised dropout rates as high as 33.3% at 36 months (Khue et al., 2017).

Vietnamese methadone program has three main objectives: 1) to reduce drug-use related harms including blood-borne diseases (HIV, hepatitis B, hepatitis C) due to sharing injection equipment, mortality from overdose and criminal activities, 2) to reduce illegal opioid use and injection, and 3) to improve individuals' quality of life and social functioning (Ministry of Health, 2011). The MoH has worked extensively with various ministries in the development of Decree 96/2012 of the Government on MMT (Vietnam Government, 2012). Under the MoH, the Vietnam Administration of HIV/AIDS Control (VAAC) is the central-level governmental organization responsible for the MMT program nationwide. At the provincial level, generally consenting on the implementation of MMT programs, the People's Council and People's Committee of each province will decide its local MMT plan and direct its department of health in implementing and supervising the program (Nguyen et al., 2012). MMT clinics would be opened in districts of significant injection-drug-driven HIV epidemic if resources allow. To receive MMT, opioid dependence patients must visit their MMT clinics daily which could be of challenges for patients who live far away from their clinics (MoH, 2010). Low adherence and high drop-out rates overtime, especially in remote and mountainous areas have been reported (Dao et al., 2018; Nguyen et al., 2017). Since 2015, the MoH started implementing the MMT dispensing model in commune health centers (CHC), aiming to improve patients' access to and retention in MMT care (MoH, 2015). As of 2019, there were 227 methadone dispensing sites at CHC nationwide, mainly in remote and/or mountainous provinces (MoH, 2019).

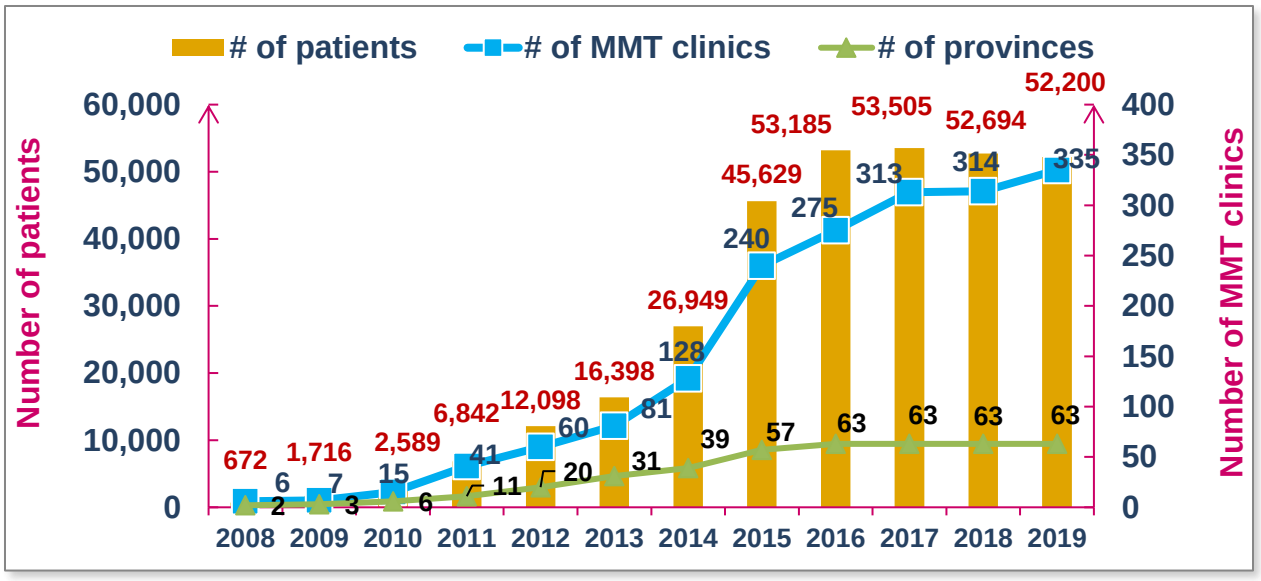

Figure 1.1 Methadone maintenance treatment scale-up in Vietnam

1.4 Vietnam public health care system

The Vietnamese public health system is organized into four administrative levels: central (national), provincial, district and commune levels. The MoH is the leading governmental organization at the central level. It is responsible for issuing health care related laws and other legal documents. The MoH works with the People's Committees at provincial levels to formulate and execute health policies and programs in the country. At the second level are 63 Provincial Health Bureaus which in charge of provincial health services and programs. Each province has at least one general hospital which is intended to receive referrals from district hospitals. Each province may also have one or more specialized centers or hospitals (e.g., oncological hospitals, cardiology centers, psychiatric hospitals, traditional medicine hospitals or tuberculosis hospitals). In terms of public health and prevention, from 2017, each province would have a center for disease control and prevention which is established from the combination of several prior preventive centers (MoH, 2017a). District Health Centers are at the third level. These centers

manage both health prevention and treatment in the district (MoH, 2016). They also provide technical support and direction to health care staff working in local intercommunal polyclinics and commune health centers. CHC are at the grass-root level. CHCs are responsible for providing a range of primary health care, including preventive, ambulatory, basic treatment, chronic disease management, and inpatient services, to between 2,000 and 10,000 persons. CHCs would refer complicated cases to higher levels in the systems of care. CHCs are expected to implement the national health programs and are generally responsible for the management of all health services at the commune level. In 2017, MoH qualified the basic package of primary health care services that CHCs must offer which help improve the CHCs' capacity and quality (MoH, 2017b).

Since the launching of CHC-focused reforms in 1994, Vietnam has made great improvement in coverage, access, use and quality of CHC services (Ellner et al., 2015; Prime Minister, 1994; WHO, 2018). As of 2017, 100% communes had a CHC. Thus, there were more than 11,000 CHC nationwide and 78% had at least one doctor (MoH, 2017c). A CHC is supposed to have from 3 to 5 health care staff and a clinic head. The heads of most CHCs are qualified physicians. However, they can be assistant doctors (i.e. people with two or three years of medical training who are able to prescribe basic medications in CHC, but is not independently certified physicians), nurses where physicians are of shortage. The staffs are often consisted of someone with a pharmacy background who is responsible for drug dispensing. Sometimes the team also includes an assistant doctor in traditional medicine, a health worker responsible for immunizations and sanitation, and an auxiliary nurse. Providers at these CHCs provide both basic health care and outreach and home-based care in their community (e.g. go to villages to provide health education and home-based vaccination). In this study, we refer these health care

providers as community health workers (CHW); however, they also serve as primary care workers in providing basic health care at the grassroots level. This combination model of community services and primary care at these CHCs in Vietnam is quite different from a separate system of community health services and independent general practitioners in many other countries.

1.5 MMT decentralization to primary care

Health care providers who provide MMT in primary care, however, face several challenges. Firstly, PWUD are a difficult population to treat, both mentally and physically due to the high prevalence of chronic comorbidities including HIV, hepatitis B, hepatitis C, and mental disorders. Primary care providers (PCP) worry about their personal safety due to their perception of patients' demanding and aggressive manners (Abouyanni et al., 2000; McKeown et al., 2003). Moreover, stigma toward drug use and medication-assisted addiction treatment would hinder the treatment effectiveness. Several PCP are reluctant to work with drugs dependent patients and to provide MMT (Abouyanni et al., 2000; Turner et al., 2005; Van Hout et al., 2018). These challenges are exacerbated by PCPs' weak technical skills and lack of knowledge and training (Lin et al., 2018; Montegut et al., 2004). While addiction treatment has not been included yet in medical training, either for doctors or for nurses, a 2-week training on MMT may not be sufficient to make providers feel confident in providing MMT services which include comorbidities management and psychological and social support. The majority of PCP worry about insufficient qualification. They stress the need for more training on methadone, better knowledge of psychiatric pathologies of addiction and continuing support from specialist professionals (Livingston et al., 2018; McKeown et al., 2003; McNeely et al., 2000; Pelet et al., 2005; Schulte et al., 2013). For clinical practice, due to the complex nature of addiction, PCP

commonly suggest an interdisciplinary approach to reduce their workload and time spending with patients, and also to improve their treatment quality (Langton et al., 2000; McKeown et al., 2003; Pelet et al., 2005; Schulte et al., 2013; Van Hout & Bingham, 2014). At the structural level, PCP consider the inadequate coverage of MMT and the lack of a mentoring system for younger providers to be systemic barriers for the program (Van Hout et al., 2018). Another concern is about the financial remuneration policy which would provide an important motivation for PCP to work in MMT (Pelet et al., 2005; Schulte et al., 2013; Van Hout et al., 2018).

In Vietnam, MMT decentralization to primary care is implemented following the "hub and spoke" model (Rawson et al., 2019). "Hubs" are the main MMT clinics which often locate at district level and provide more comprehensive medical management of drug dependence and comorbidities. "Hubs" are responsible for starting new patients on treatment and taking care of "difficult patients" with significant comorbidities or concurrent illicit drug use. "Spokes" are CHC, in charge of daily dispensing methadone and managing "stable patients". This "hub and spoke" model is expected to be an ideal model in the context of Vietnam where drop-out rates from MMT program are high, especially at remote area due to travel difficulties, and take-home methadone is not allowed for the fear of diversion (Dao et al., 2018; MoH, 2010; Nguyen et al., 2017). Although having been implemented for 5 years, there was no study, to our knowledge, examine the challenges for CHW working in these CHC in providing MMT decentralization in Vietnam. The challenges of PCP in providing MMT, though have been widely documented in Western high-income countries, would be different in Vietnam and other Asia countries.

1.6 Theoretical framework

To investigate the challenges of MMT decentralization in primary care in Vietnam, we adapt the four-level healthcare system framework which includes (1) the individual patient, (2) professional care providers and the care teams, (3) the organization that supports the development and work of care teams by providing infrastructure and complementary resources, and (4) the political and economic environment under which organizations, care providers and individual patients operate (Fanjiang et al., 2005).

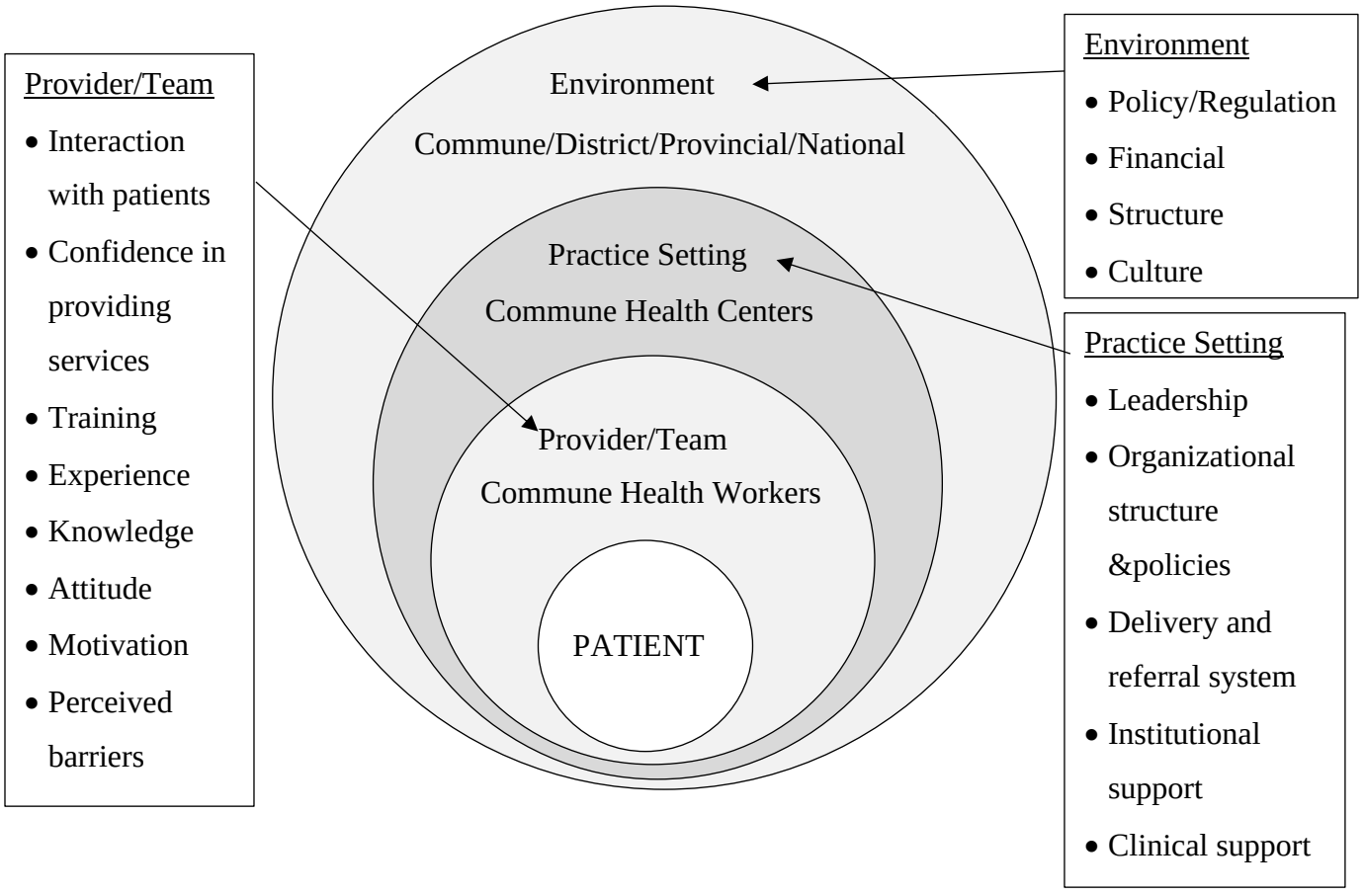

Figure 1.2 Multilevel influences of a four-level healthcare system

1.7 Study aims

The primary aim of this study is to identify strategies to improve MMT decentralization in CHC in Vietnam and to provide recommendations for future multi-level interventions to improve MMT decentralization in primary care in general.

Our specific objectives include:

1) To investigate the association between CHWs' interaction with PWUD and their stigmatizing attitude towards PWUD.
2) To investigate the association between CHWs' confidence in providing MMT and their MMT knowledge and experiences.
3) To identify practical and structural challenges of the MMT decentralization to CHC perceived by CHWs.

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Chapter 2: Community health workers' stigma towards and interaction with people who use drugs in primary care settings in Vietnam

Abstract

Background: Provider-patient interaction plays an important role in treatment access and outcomes. This study aims to investigate factors associated with community health workers (CHW) interaction with people who use drugs (PWUD) in primary care settings.

Methods: Data were from a cross-sectional self-assessment of 300 CHW in 60 communities in two provinces in Vietnam. We measured CHWs' perception of risk and challenges when working with PWUD, institutional support, job satisfaction, stigma and empathy towards PWUD, and interaction with PWUD with multi-item scales. A multilevel regression model was performed to explore the association between the CHWs' interaction with PWUD and their stigmatizing attitude towards PWUD after adjusting for CHWs' background and other characteristics.

Results: The mean score of CHWs' interaction with PWUD 36.4 (SD 8.8) on a scale of 60. After adjusting for background characteristics including gender, education level, job position and years in medical fields, stigma towards PWUD (β = -0.84, 95% CL: -1.05; -0.63) were negatively associated with CHWs' interaction with PWUD. CHWs' perception of risk (β = -0.24, 95% CL: -0.48; -0.01) and challenges when working with PWUD (β = -0.32, 95% CL: -0.54; -0.10) also associated with their interaction with PWUD.

Conclusion: CHWs' perceptions and stigma towards PWUD are negatively associated with their interaction with PWUD in primary care settings. Our findings suggest that interventions to

reduce CHWs' stigma towards PWUD and improve community-based working environment are important to enhance CHWs' clinical communication with PWUD for better treatment outcomes.

Keywords: community health workers, provider-client interaction, stigma, people who use drugs, Vietnam

Introduction

The interactions between providers and their patients are important and contribute to treatment outcomes. Providers' effective communication empowers patients to be more active in treatment decisions throughout care. Studies have shown its effects on patient satisfaction and improves patients' health outcomes (Oetzel et al., 2015; Ong et al., 1995; Stewart, 1995). The relationship with providers is even more important for marginalized populations with chronic diseases such as substance abusers in improving their access to all levels of care. A recent systematic review also suggested that client-provider relationships are effective in predicting client retention in treatment and client ultimate outcomes (Marsh et al., 2012). However, previous studies have observed primary care providers' discomfort and avoidance during drug-related discussions with patients, even if they discussed alcohol, the most socially accepted drug (McCormick et al., 2006). Moreover, people who use drugs (PWUD) often lack the ability to effectively communicate with healthcare providers while they are at greater needs of healthcare than the general population (French et al., 2000; Health et al., 2016; McCoy et al., 2001).

Several associated factors to provider-client interactions are known. First, providers' attitude and communication skills are integral parts of effective communication. Studies have shown that negative attitudes of health professionals towards patients with alcoholism or other drug addictions are associated with poor communication between professional and patient (Thornicroft et al., 2007). However, at primary care settings where providers are expected to be more open and less stigmatizing towards drug use behaviors, PWUD were reportedly the most judged population by providers compared to patients with other health conditions (Ronzani et al., 2009). Among communication skills, empathy is most helpful for better exchanges between providers and patients. With empathy, providers can better understand patients' illness, treatment

expectations and challenges. This results in better patient-provider communication by lowering patient's emotional distress and increasing their satisfaction with treatment (Derksen et al., 2013; Neumann et al., 2007). Second, provider's perception of their job also relates to their relationships with patients. Providers who are satisfied with their job appear to have better relationships with patients and provide patients with more information throughout treatment (Perez-Carceles et al., 2006; William & Skinner, 2003). How providers perceive risks and difficulties when working with certain kinds of patients may lead to their reluctance in communicating and providing care to these patients. PWUD are often considered to be at high risk of infectious diseases including HIV and viral hepatitis and stereotyped to be violent. This might make health care providers reluctant to work with them. Moreover, as a physically and psychologically chronic disorder, addicted patients are perceived to be among the most challenging patients to treat (Ronzani et al., 2009). Lastly, providers' background characteristics such as gender, medical training and job position have been shown to be associated with providers' attitudes, empathy and interactions with patients (Ledda et al., 2017; Li et al., 2012, 2017).

People who use drugs (PWUD) account for about 70% people living with HIV in Vietnam, placing them are at the center of the country's twin HIV and addiction epidemics. To improve their care continuum, the country has decentralized the delivery of ARV and MMT services to commune health centers (CHC), primary care clinics at the grass-root level of the healthcare system in 2012 and 2015, respectively. Thus, community health workers (CHW) at these CHC are expected to constitute a crucial component of the success of these programs and are responsible for delivering a wide range of primary care services, now including ARV and MMT. However, to our knowledge, limited study has explored how stigmatizing attitudes may

be associated with the interactions between CHWs and PWUD. We hypothesize that CHWs with greater stigma towards PWUD would have less clinical interaction with this population.

Methods

Study participants

We used baseline data of a randomized controlled trial conducted in Vinh Phuc and Phu Tho provinces, Vietnam (Li et al., 2018). The data were collected from October 2014 to February 2015 among CHWs working in 60 CHC (30 from each province). At CHCs, a CHW was eligible to participate in the study if he/she was (1) 18 years old or older and (2) a doctor, assistant doctor, nurse, pharmacist, midwife, lab technician, or public health worker who provided medical services to patients in the community. The CHW participants were informed of the study objectives, procedures, risks and benefits and provided a written informed consent. A total of 300 CHWs agreed to participate and were recruited. The study was approved by the Institutional Review Boards of the participating research institutes in the United States and Vietnam.

Data collection

After being enrolled, participants completed an individual assessment on a computer in a private office at a CHC (the computer-assisted self-interview (CASI) method). Participants read the questions on a laptop screen and entered their responses directly into a computerized database. Trained staff were available on site to provide instructions on using the CASI system and clarifications for the survey questions. All questions were in Vietnamese. Each assessment took 45-60 minutes to complete. Participants received 80,000 VND (approximately 4 USD) after completing the assessment as the compensation for their time.

Measures

Interaction with PWUD was measured by a 12-item scale adapted from provider-client interaction scale used in MMT clinics in China (Li et al., 2013). These questions asked about how CHW interacted with PWUD and their family members. For example, we asked if CHWs provided counselling and/or encouraged PWUD when interacting with them. Responses ranging from 1 = "not at all" to 5 = "very much". The internal consistency of this scale was acceptable (Cronbach's alpha 0.89). (Table 2.1)

Stigma attitude towards PWUD was measured by seven questions, adapted from a training material on health professional's attitude towards licit and illicit drug users (Flinders University, Adelaide Australia, 2006). The questions asked about the extent to which CHWs feel disappointed, sympathetic or concerned towards PWUD and think that PWUD deserve the same level of medical care as others. Responses ranging from 1 = "not at all" to 5 = "very much". We excluded one item from the original scale which had a reverse direction with other items in the scale. With this exclusion, the internal consistency of the scale in our study increased from 0.63 to 0.73. Some items were reverse-coded, then all items were summed. A higher score indicated a greater level of negative attitude towards PWUD. (Table 2.2)

Empathy towards PWUD were measured by a 20-item scale adapted from the Jefferson scale of empathy (Hojat et al., 2001). The questions measured CHWs' perception of empathy and their mobilization of empathy skills in working with PWUD. Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". After reverse-coding some items, all scores were summed, and a higher summary score indicated a higher level of empathy. In the study sample, the internal consistency of this scale was acceptable (Cronbach's alpha 0.86). (Table 2.3)

Perceived risk was measured by five questions about feelings of safety and risks of getting infectious diseases including HIV, TB, and hepatitis when working with PWUD (Bennett et al., 1994). *Perceived challenges* were measured by seven questions. These questions asked CHWs about whether it is hard for PWUD to be engaged, adhere to treatment and change their drug use behaviors. Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". All items were reverse-coded and then summed. A higher score indicated a greater level of perceived risk and challenges when working with PWUD. The internal consistency of the two scales was acceptable with a Cronbach's alpha of 0.86 and 0.78, respectively. (Table 2.4 and 2.5)

Institutional support was measured by a 12-item scale about the availability of universal precaution facilities and resources in CHC (Li et al., 2008). The questions focused on three main categories including (1) universal precaution supplies, (2) post-exposure prophylaxis and (3) information and testing. Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". All items were reverse-coded and then summed. A higher score indicated a greater level of perceived institutional support (Cronbach's alpha 0.83). (Table 2.6)

Job satisfaction was measured by a 30-question scale including four sub-scales: work motivation, interaction with colleagues, work-life and self-fulfillment (Bellingham, 2004). Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". All items were reverse-coded and then summed. Higher scores indicate higher level of satisfaction. The scale has an acceptable internal consistency (Cronbach's alpha 0.94). (Table 2.7)

Participants' demographic and professional background characteristics including age (years), gender (male vs. female), education level (graduate medical training vs. lower), job

position (doctor/assistant doctor vs. others), and time working in the medical field (years) were self-reported.

Statistical analysis

First, a descriptive analysis of CHWs' demographic characteristics and CHWs' interactions with PWUD was conducted. We presented categorical variables by number and percentage of each group and summarized continuous variables by means and standard deviations. We assessed the correlation between CHWs' interactions with PWUD and categorical variables and continuous variables by the ANOVA test and Pearson correlation, respectively.

Second, we conducted a multilevel regression model with CHWs' interactions with PWUD as the main outcome and different exposure characteristics. Multilevel regression would be appropriate to deal with our correlated sample in which several CHWs came from the same CHC. Variables were included in the model based on their associations with the main outcome from the literature and from our data (statistically significant level was set at $\alpha = 0.05$). Participants' background characteristics including gender, education level, job position, and time in medical field were adjusted in the model. We did not include age in all models due to its strong collinearity with years in the medical field ($r = 0.87$, $p < 0.001$). All analysis was performed in SAS software version 9.4 (SAS Institute, Inc., Cary, NC).

Results

Socio-demographics and professional characteristics of the study participants

There was no refusal in the study. Among the 300 CHW participants, 73 (24.3%) were male, 167 (55.7%) were doctors or assistant doctors, and 56 (18.7%) had at least 4 years of medical training. All but one was of Kinh ethnicity. The average age was 40.1 (SD 10.2), average years working in the medical field was 15.9 (SD 10.1) and average years working at the current CHC was 12.4 (SD 10.2). The average interaction and stigma scores were 36.4 (SD 8.8, range 12 – 58) and 18.8 (SD 4.3, range 7 – 35), respectively. Ranges and average scores of other factors potentially related with CHWs' interaction with PWUD are presented in Table 2.9.

Binary associations between CHWs' interaction with PWUD and their characteristics

CHWs' interactions with PWUD had no association with their background characteristics including age, gender, education level, job position and time in the medical field (Table 2.10). For attitude and job-related factors, CHWs' interactions with PWUD were negatively associated with their perceived risk ($r = -0.33$, $p < .001$) and perceived challenges ($r = -0.35$, $p < .001$) when working with PWUD and stigma attitude ($r = -0.51$, $p < .001$) towards PWUD, and positively associated with their job satisfaction ($r = 0.14$, $p = 0.002$) and empathy towards PWUD ($r = 0.32$, $p < .001$) (Table 2.11).

Factors associated with CHWs' interaction with PWUD

CHWs with more stigma towards PWUD ($\beta = -0.84$, 95% CL: -1.05; -0.63), higher perceived risk ($\beta = -0.24$, 95% CL: -0.48; -0.01), and higher perceived challenges ($\beta = -0.32$, 95% CL: -0.54; -0.10) were less likely to interact with PWUD. CHWs' job satisfaction ($\beta = 0.0003$, 95% CL: -0.09; 0.09) and empathy towards PWUD ($\beta = 0.10$, 95% CL: -0.02; 0.22) were not associated with their interaction with PWUD (Table 2.12).

Discussion

The study findings confirm our hypothesis that stigma is among the most important factors negatively associated with CHWs' interaction with PWUD. This result is consistent with previous studies among other kinds of providers (Nguyen et al., 2019). A recent study proposed some explanations of how providers' stigma attitude shaped their interactions with patients using a theoretical framework of cultural health capital (Chang et al., 2016). According to Chang's study, PWUD, although were routinely stigmatized, might receive stigmatization at different degree depending on whether they possessed a kind of cultural capital that was appreciated by providers or not. PWUD could deploy their cultural health capital (e.g. knowledge of medical topics, physical appearance and communication skills) to reduce the negative effect of stigma towards their drug use behavior and enable more interaction from providers. On the other hand, if providers bear very intensive stigma attitude, they could barely recognize patient's cultural health capital. The stigmatization in this case would profoundly affect their interaction with patients with drug use. Looking at the situation in Vietnam from this perspective, we can see that our PWUD, who often had low education and lacked social skills, might be unable to mobilize appropriate cultural capital to counteract providers' stigmatization towards their drug user status. However, health care providers at the community level, with their unique access to and understanding of the community, are expected to have less stigma towards PWUD compare to those at higher levels (Catalani et al., 2009; Morgan et al., 2015). Further studies should examine the mechanism of this association to inform more effective interventions tailoring for primary care settings.

CHWs' interaction with PWUD, in addition, was found to be associated with CHWs' perceptions of working with PWUD. The more risk of getting infected or being attacked CHWs

perceived when working with PWUD, the less likely they would interact with PWUD. This fear of risk could be due to ill-equipped facilities which lacked protective measures for providers. This lack of protective measures is common in primary care settings in lower-middle income countries (Ozturk & Babacan, 2014; Senthil et al., 2015; Xuan Tran et al., 2013). In addition, CHW, with their lack of training and experience in dealing with addiction would perceive the work with PWUD challenging (Catalani et al., 2009; Ronzani et al., 2009; Van Boekel et al., 2013). These perceptions of risk and challenges could make them reluctant to interact with PWUD. From another perspective, some studies have shown that more interaction with PWUD was associated with less perceived challenges in providing care for PWUD (Langton et al., 2000). These results suggest the importance of working environments and of medical training to reduce CHWs' perception of risk and challenges when working with a marginalized group like PWUD, therefore improving provider-patient clinical interactions.

The study results should be viewed in light of its limitations. First, the generalizability of the results may be affected by the recruitment frame of several CHWs per a CHC. Second, we had not been able to control for some clinic characteristics (e.g. other research projects at the commune area) which might affect the provider-client interactions at a structural level. In addition, the study used some unvalidated measures, which limited the confidence in the findings and inhibited comparison across studies. Despite these limitations, the study has identified important factors associated with CHWs' interactions with PWUD in primary care settings in a lower-middle income country.

Conclusion

The study highlights the importance of CHWs' perceptions and stigma towards PWUD in their interaction with these patients. Improved working environment and tailored training to reduce CHWs' stigma and perceived risk and challenges should be included in future intervention programs to improve their relationship with PWUD for better treatment outcomes.

Table 2.1. Scale to measure provider – client interaction

1	Do you provide counseling spontaneously to your drug using clients and their family members?
2	Do you answer clients' and their family members' questions about their concerns?
3	Do you ask drug using clients their family members the questions about their concern?
4	Do you try to be friendly with your clients and their family members?
5	Do you find out the reason if your clients and their family members missed an appointment?
6	Do you think it is necessary to interact with your drug using clients and their family members other than only giving medications?
7	Do you encourage your drug using clients and their family members when you interact with them?
8	Do you feel comfortable when you work closely with your drug using clients and their family members?
9	Do you feel your clients are somehow more than just ordinary patients?
10	Do you feel your clients are the same as the other patients for medical service?
11	Do you provide the same quality of care to the drug users that you provide to other clients?
12	Do you interact with the drug using clients just like other patients?

Table 2.2 Scale to measure stigma towards PWUD

1	To what extent are adverse life circumstances likely to be responsible for a person's problematic drug use? (R)
2	To what extent do you feel angry towards people using drugs?
3	To what extent do you feel disappointed towards people using drugs?
4	To what extent do you feel sympathetic towards people using drugs? (R)
5	To what extent do you feel concerned towards people using drugs? (R)
6	To what extent do people who use drugs deserve the same level of medical care as people who don't use drugs? (R)
7	To what extent are people who use drugs are entitled to the same level of medical care as people who don't use drugs? (R)

Table 2.3 Scale to measure empathy towards PWUD

1	You try to imagine yourself in your clients' shoes when providing care to them. (R)
2	Your understanding of your clients' feelings gives them a sense of validation that is therapeutic in its own right. (R)
3	An important component of the relationship with your clients is your understanding of the emotional status of themselves and their families. (R)
4	You try to understand what is going on in your clients' minds by paying attention to their nonverbal cues and body language. (R)
5	You try to think like your clients in order to render better care. (R)
6	You believe that empathy is an important therapeutic factor in medical treatment. (R)
7	Empathy is a therapeutic skill without which your success as a health care provider would be limited. (R)
8	Clients' illnesses can only be cured by medical treatment; therefore, affection ties to your clients cannot have a significant place in this endeavor.
9	You do not allow yourself to be touched by intense emotional relationships between your clients and their family members.
10	You believe that emotion has no place in the treatment of medical illness.
11	Because people are different, it is almost impossible for you to see things from your clients' perspectives.
12	Attentiveness to your clients' personal experiences is irrelevant to treatment effectiveness.
13	Your clients feel better when you understand their feelings. (R)
14	You have a good sense of humor that you think contributes to a better clinical outcome. (R)
15	You consider understanding your clients' body language as important as verbal communication in caregiver–client relationships. (R)
16	You try not to pay attention to your clients' emotions in interviewing and history taking.
17	You consider asking clients about what is happening in their lives as an unimportant factor in understanding their physical complaints.
18	It is difficult for you to view things from your clients' perspectives.
19	You do not enjoy reading non-medical literature and the arts.
20	Your understanding of how your clients and their families feel is an irrelevant factor in medical treatment.

Table 2.4 Scale to measure perceived risk of working with PWUD

1	Your work is at high HIV risk. (R)
2	Your work is at high risk to be attacked by clients whom you work with. (R)
3	You feel unsafe at your work. (R)
4	Your work is at high risk of TB disease. (R)
5	Your work is at high risk of Hepatitis. (R)

Table 2.5 Scale to measure perceived challenges of working with PWUD

1	Drug using clients are hard to get in touch with. (R)
2	You feel despondent that your drug using clients are devious and not telling you the truth. (R)
3	It is hard to have drug using clients adhere to the treatment. (R)
4	It is hard to engage drug using clients in treatment programs. (R)
5	It is almost impossible to change drug using behavior. (R)
6	It is hard to engage the family members in support of drug users' treatment. (R)
7	You do not have enough training or skill to treat drug using clients. (R)

Table 2.6 Scale to measure perceived institutional support

1	Generally speaking, the supervisor of this hospital thinks much of your self-protection. (R)
2	There are always sterile rubber gloves available at your hospital when you need them for work. (R)
3	There are always sterile needles available at your hospital when you need them for work. (R)
4	There is always disinfectant available at your hospital when you need them for work. (R)
5	There are always disposal containers available at your hospital when you need them for work. (R)
6	A working autoclave is always available for daily use at your hospital. (R)
7	Providers at your hospital can properly perform concurrent disinfection if needle stick or body fluid spills happened to them. (R)
8	ARV drugs are available for post-exposure prophylaxis at your hospital if occupational exposure happens. (R)
9	There is HIV anti-body testing available at your hospital/clinic. (R)
10	You have timely access to appropriate consulting at your hospital/clinic if occupational exposure happens. (R)
11	You would have sufficient health insurance coverage if you were infected with HIV in your job. (R)
12	Providers at your hospital/clinic can be kept strictly confidential if occupational exposures happen to them. (R)

Table 2.7 Scale to measure job satisfaction

1	You look forward to going to work on Monday morning. (R)
2	You feel positive and up most of the time you are working. (R)
3	You have energy at the end of each workday to attend to the people you care about. (R)
4	You have energy at the end of each workday to engage in personal interests. (R)
5	You have the time and energy in your life to read books that interest you. (R)
6	Most interactions at work are positive. (R)
7	You have good friends at work. (R)
8	You feel valued and affirmed at work. (R)
9	You feel recognized and appreciated at work. (R)
10	Work is a real plus in your life. (R)
11	You are engaged in meaningful work. (R)
12	You feel free to be who you are at work. (R)
13	You feel free to do things the way you like at work. (R)
14	Your values fit with the organizational values. (R)
15	You are aligned with the organizational mission. (R)
16	You trust your leadership team. (R)
17	You respect the work of your peers. (R)
18	You have opportunities to learn what you want to learn. (R)
19	You feel involved in decisions that affect your organizational community. (R)
20	Creativity and innovation are supported. (R)
21	You feel informed about what's going on. (R)
22	You know what is expected of you at work. (R)
23	You have the materials and equipment that you need in order to do your work right. (R)
24	You have the opportunity to do what you do best every day at work. (R)
25	Your manager cares about you as a person. (R)
26	You know someone at work who encourages your development. (R)
27	Your opinions count. (R)
28	Your coworkers are committed to doing quality work. (R)

29	Your manager reviews your progress. (R)
30	You are paid fairly. (R)

Table 2.8 Demographic and background characteristics of CHW (N= 300)

Characteristics	Mean (SD)	N (%)
Age	39.3 (10.3)	
Years in medical field	14.9 (10.0)	
Years at current CHC	12.4 (10.2)	
Gender		
Male		73 (24.3)
Female		227 (75.6)
Ethnicity		
Kinh		299 (99.7)
Other		1 (0.3)
Highest medical training		
≥ 4 years		56 (18.7)
< 4 years		244 (81.3)
Job position		
Doctor		50 (16.67)
Assistant doctor		117 (39.0)
Nurse		53 (17.7)
Midwife/Pharmacist/Other		80 (26.6)

Table 2.9 Scales measure CHWs' perceptions and attitudes when working with PWUD (N= 300)

Characteristics	Theoretical range	Actual range	Mean (SD)
Client-provider interaction	12 – 60	12 – 58	36.4 (8.8)
Perceived institutional support	12 – 60	37 – 60	47.5 (5.2)
Perceived risk	5 – 25	5 – 25	17.0 (4.2)
Perceived challenges	7 – 35	8 – 35	23.5 (4.3)
Job satisfaction	30 – 150	92 – 150	120.8 (10.3)
Stigma towards PWUD	7 – 35	8 – 30	18.8 (4.3)
Empathy towards PWUD	20 – 100	47 – 95	71.6 (8.2)

Table 2.10. CHWs' interaction with PWUD by CHWs' background characteristic groups (N=300)

Characteristics	N (%)	Client-provider interaction Mean (SD)	p-value
Gender			0.118
Female	227 (75.6)	35.9 (8.7)	
Male	73 (24.3)	37.8 (9.0)	
Highest medical training			0.128
≥ 4 years	56 (18.7)	38.0 (9.1)	
< 4 years	244 (81.3)	36.0 (8.7)	
Job position			0.662
Doctor/Assistant doctor	167 (55.7)	36.6 (9.0)	
Nurse/Midwife/Other	133 (44.3)	36.1 (8.6)	

Table 2.11. Pearson correlations matrix of CHWs' characteristics (N=300)

Variables	1	2	3	4	5	6	7	8
1. Age								
2. Years in medical field	0.86[c]							
3. Perceived risk	0.01	0.08						
4. Perceived challenges	-0.08	-0.09	0.31[c]					
5. Institutional support	0.01	0.04	0.10	0.03				
6. Job satisfaction	<0.01	-0.02	-0.04	0.01	0.51[c]			
7. Stigma towards PWUD	-0.08	-0.04	0.26[c]	0.30[c]	-0.12[a]	-0.22[c]		
8. Empathy towards PWUD	0.02	<0.01	-0.43[c]	-0.31[c]	0.19[b]	0.27[c]	-0.25[c]	
9. Interaction with PWUD	0.07	0.04	-0.33[c]	-0.35[c]	0.03	0.14[a]	-0.51[c]	0.32[c]

PWUD: People who use drugs; [a]p<0.05; [b]p<0.01; [c]p<0.001

Table 2.12. Multilevel regression model on CHWs' interaction with PWUD (N=300)

Variables	β	95% CL	p
Male vs. Female	0.34	-1.68; 2.62	0.667
At least 4-year medical training vs. Lower	1.17	-1.44; 3.25	0.447
Doctor/Assistant doctor vs. Other	-0.30	-2.89; 1.14	0.391
Years in the medical field	0.01	-0.07; 0.12	0.615
Perceived risk	-0.24	-0.48; -0.01	0.041
Perceived challenges	-0.32	-0.54; -0.10	0.005
Job satisfaction	0.0003	-0.09; 0.09	0.996
Stigma towards PWUD	-0.84	-1.05; -0.63	<0.001
Empathy towards PWUD	0.10	-0.02; 0.22	0.116

PWUD: People who use drugs; CL: confidence limits

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Chapter 3: Confidence in providing methadone maintenance treatment services of community health workers in Vietnam

Abstract

Background: As a response to the dual epidemic of HIV and drug use, methadone maintenance treatment (MMT) had been nationally implemented and decentralized to commune level in Vietnam. However, little is known about community health workers' (CHW) confidence in providing MMT services for people who use drugs (PWUD) at commune health centers (CHC). This study aims to investigate factors related to CHWs' confidence in providing MMT services in Vietnam.

Methods: A cross-sectional survey was conducted using tablet-assisted self-interview method among 276 CHWs from 67 communes in Dien Bien, Vietnam. Participant characteristics such as gender, age, job position, training and working experience, MMT knowledge were included in the survey. We used multi-item scales to measure CHWs' confidence in providing MMT services, belief in harm reduction, perceived work-related support, perceived stigma and perceived risk of working with PWUD, and empathy towards PWUD. We performed multilevel linear regression analyses to explore the correlates of CHWs' confidence in providing MMT services in the whole study sample and separately in two subgroups of CHWs based on their MMT experience (i.e. ever vs. never involved in MMT program). Multilevel analyses were adjusted for CHWs' age, gender, and ethnicity, ART status of commune health centers, and number of ethnicity groups in the commune area.

Result: Of all participants, 114 (41.3%) had ever been involved in MMT program. The mean confidence to provide MMT services was 45.0 on a scale of 60 and was higher among CHWs

who had ever been in MMT than those who had never been in MMT (mean score 50.3 vs. 41.2, respectively). Better MMT knowledge was associated with higher levels of confidence in providing MMT services among CHWs who never involved in MMT program (β=0.90, 95%CL: 0.29; 1.51), not among those who ever did. On the other hand, technical support in working with PWUD was associated with a higher level of confidence in providing MMT services for both groups (β=0.71, 95%CL: 0.35; 1.08 and β=0.58, 95%CL: 0.19; 0.96 among CHWs who had ever and who had never worked in MMT, respectively).

Conclusion: CHWs' confidence in providing MMT was associated with different characteristics, depending on their experience in MMT program. Our findings suggest that future interventions to improve CHWs' confidence should be diverse to benefit CHW subgroups. Providing MMT trainings for potentially new providers and continuing support for all providers is essential to improve MMT quality of care.

Key words: Methadone maintenance treatment, confidence, community health worker, primary care, Vietnam

Introduction

CHWs and primary care providers (PCP) have been considered an integral part of health care workforce since the early twentieth century to insure equity and universal health care (Lehmann & Sanders, 2007; WHO, 2018). These professionals serve as a gate for community members to enter the healthcare system. While CHWs are in general frontline public health workers who connect patients in the community to healthcare providers, primary care workers provide the basic care and make appropriate referrals to specialty care in case of need (Catalani et al., 2009; Olaniran et al., 2017). CHWs are extremely important as they reach to community members, especially hard-to-reach populations and increase the public access to care (Torres et al., 2014; Seutloali et al., 2018; Swider, 2002). CHWs also contribute to health education and promote healthy behavioral changes (Seutloali et al., 2018; Westgard et al., 2018). Under the modern concept of primary health care, PCPs implement the whole-of-society approach to improve health by supporting people's health and well-being and providing the needed care within a geographically close distance to where people live (WHO, 2018). Under this definition, the responsibilities of CHWs and PCPs are strongly connected and somewhat overlap.

To achieve the Millennium Development Goals, the World Health Organization has called for a task-shifting in health care workforce in 2008 which highlighted the importance of CHWs and primary health care (WHO, 2008). Several countries have successfully shifted HIV care and treatment from health care professionals to lay or primary health workers and reported its effectiveness and cost-effectiveness (Callaghan et al., 2010; Mdege et al., 2013). On the other hand, other countries reported challenges including the low capacity for health care delivery, especially the new services that went beyond their original scope of practice (Ma et al., 2015; Mijovic et al., 2016). Most PCPs do not feel competent to provide HIV and substance use

disorders care (Miller et al., 2001). Providers are generally unwilling to work with patients with such issues and find treating them unrewarding (Miller et al., 2001; Saitz et al., 2002). Several studies also reported the inadequate performance of CHWs and PCPs as a consequence of the lack of training and support for these professionals (Catalani et al., 2009; Rowe et al., 2005; Scott et al., 2018; Stekelenburg et al., 2003). Therefore, a common suggestion to ensure a better performance of CHWs and PCPs is continuous training and frequent supportive supervision (Kok et al., 2015; Scott et al., 2018).

The Vietnamese public health system is organized into four administrative levels: central (national), provincial, district and commune level. The CHC in each commune is responsible for implementing national preventive health programs, providing basic medical care, and managing all health services at this level. The health care providers working at these CHCs are referred as CHWs; however, they also serve as PCP in providing basic health care at the grassroots level and refer patients to upper levels health agencies or more specialized treatment settings in case of need. Since 2015, Vietnam has integrated methadone maintenance treatment (MMT) into CHCs, 5 years after the national scale-up of the program (Ministry of Health, 2015). This decentralization aims to improve patient access to and retention in MMT care (Dao et al., 2018; Nguyen et al., 2017). As of 2019, the decentralization of MMT has been implemented in 24 out of 63 provinces of Vietnam, mostly in remote and/or mountainous areas (Ministry of Health, 2019). To explore how to improve the quality of the decentralization, our study aimed (1) to investigate the differences between CHWs with experiences providing MMT and those without these experiences and (2) to describe the level of confidence in providing MMT services and its associated factors in these two groups of CHWs. We hypothesize that CHWs' confidence in

providing MMT is positively associated with their MMT knowledge and perceived work-related supports.

Dien Bien is a Northwest province of Vietnam. As a remote, mountainous province, the population in Dien Bien is scattered and largely of ethnic minorities. The province is characterized by poverty, low education, and frequent labor migration. The HIV epidemic in Dien Bien is primarily driven by drug injection and has been documented since 1998. In 2009, HIV prevalence among PWID in Dien Bien was 56% - the highest among all cities/provinces in the country (MoH, 2012). Being one of the 5 key PEPFAR Vietnam-supported provinces since then, Dien Bien has made great progress in HIV control and prevention. HIV prevalence among PWID in Dien Bien has decreased to 31% in 2013 (MoH, 2014) and 26% in 2018 (PEPFAR, 2018). With support from PEPFAR and other international organizations, Dien Bien has developed a system of HIV and drug treatment, especially through the process of decentralization. By the end of 2018, Dien Bien provided MMT in 34 and ART in 68 among its 130 communes. Of the total of 2,649 patients currently receiving MMT, 1,378 patients are receiving MMT at CHCs. Despite the program's efforts, the total number of people currently on MMT in Dien Bien only account for 60.2% of the provincial target (4400 PWUD in MMT treatment). This result is below the national coverage of 65.5%. With this current situation, Dien Bien has been chosen to conduct this study.

Methods

Study participants

A cross-sectional survey among CHWs in Dien Bien was conducted in November and December 2019. We included all the 29 CHCs that provided MMT services and randomly

selected 38 CHCs without MMT for the study. In total, there were 67 CHCs under 9 districts in our study. All participants needed to be at least 18 years old. In the CHCs that provided MMT services, we recruited those who had been working in the local MMT program including the program managers, doctors, assistant doctors, counselors, pharmacists, and medication dispensing staff. In the CHCs that provided no MMT, potential participants were doctor, assistant doctor, nurse, pharmacist, or medication dispensing staff. All eligible CHWs in the selected CHCs were invited to participate in the study. Potential participants were informed about the study objectives, procedures, risks and benefits before giving a verbal informed consent if they agreed to participate in the study. The Institutional Review Boards of University of California, Los Angeles, United States and Hanoi Medical University, Vietnam approved the study.

Data collection

After being enrolled, participants completed an individual assessment on a tablet in a private office at their CHCs. Participants read the on-screen questions and entered their responses directly into a computerized database. Our trained staffs were available on site to provide instructions on how to use the online system and clarify the survey questions when needed. All questions were in Vietnamese. Each assessment took between 45 and 60 minutes to complete. Participants received 100,000 VND (approximately 5 USD) after completing the assessment as a compensation for their time.

Measures

Confidence in providing MMT services was measured by a 15-item scale (Cronbach's alpha 0.93). We adapted this scale from a standard generalized self-efficacy scale (Schwarzer &

Jerusalem, 1995) and the Vietnam treatment guideline at MMT dispensing sites (Ministry of Health, 2015). The questions asked about how confident CHW were in working with MMT patients and providing specific tasks in methadone treatment. For example, questions were about how CHW felt confident in treating and counseling patients in different treatment phases or in managing MMT storing and dosing. Responses included 1 = "not true", 2 = "hardly true", 3 = " moderately true" and 4 = "exactly true". All scores were summed, and a higher total score indicated a higher level of confidence (Table 3.1).

MMT knowledge was measured by 20 true/false questions adapted from Caplehorn et al. (1996) and the Vietnam national training materials for MMT providers (Ministry of Health, 2010). The questions asked about basic knowledge related to MMT. We coded false and true answers as 0 and 1, respectively. All scores were summed and a higher total score indicated a better MMT knowledge (Table 3.2).

Belief in harm reduction approach of substance use and MMT was measured by a 4-item scale (Cronbach's alpha 0.66) adapted from a previous a study (Pradhan, 2015). The scale items were about the harm reduction approach of interventions for substance abuse. Responses ranged from 1 = "strongly agree" to 4 = "strongly disagree". All scores were reverse-coded and then summed. A higher total score indicated a stronger belief in harm reduction (Table 3.3).

Perceived work-related support was measured by a 3-item scale (Cronbach's alpha 0.84). This scale was a sub-scale of the Drug problems perceptions questionnaire (Watson et al., 2007). The items inquired about the perceived technical support that CHW received while working with PWUD. Responses ranged from 1 = "strongly agree" to 7 = "strongly disagree". All scores were

reverse-coded and then summed. A higher total score indicated more perceived work-related support (Table 3.4).

Empathy towards PWUD were measured by a 20-item scale (Cronbach's alpha 0.86). We adapted this scale from the Jefferson scale of empathy (Hojat et al., 2001). The questions measured CHWs' empathy towards PWUD and their empathy skills in working with PWUD. Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". After reverse-coding some items, all scores were summed, and a higher total score indicated more empathy (Table 2.3).

Perceived stigma of working with PWUD was measured by a 6-item scale (Cronbach's alpha 0.88) which was used a previous study in China (Li et al., 2007). The items were about CHWs' experiences of stigma and discrimination related to their work with PWUD. Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". All scores were summed, and a higher summary score indicated a higher level of their perceived stigma (Table 3.5).

Perceived risk in working with PWUD was measured by four questions about feelings of their personal safety and risks of getting infectious diseases including HIV, TB, and hepatitis when working with PWUD (Cronbach's alpha 0.84) (Bennett et al., 1994). Response categories ranged from 1 = "strongly agree" to 5 = "strongly disagree". All items were reverse-coded and then summed. A higher score indicated a greater perceived risk (Table 2.4).

We collected information about participants' demographic characteristics including age (years), gender (male vs. female), ethnicity (Kinh, Thai and other), education level (≥ 4 years of medical training vs. lower), job position (doctor/assistant doctor vs. other). We also inquired about participants' professional and training background including duration of time working in

the medical field (years), number of PWUD seen in a month, substance use disorder (SUD) related training (≥ 2 courses, 1 course and 0), and HIV-related training (ever vs. never been trained). We collected several characteristics at the commune level including the number of ethnicity groups in CHCs' catchment area and the ART provision status (yes vs. no) of the CHCs.

Statistical analysis

First, we conducted a descriptive analysis of CHWs' demographic characteristics and their knowledge, attitude and perception related to their confidence in providing MMT services. We presented categorical variables by number and percentage of each group and summarized continuous variables by means and standard deviations. All characteristics and scales were compared between CHWs who had ever vs. never been involved in MMT using appropriate statistic tests (i.e. Chi-squared test for categorical variables and ANOVA test for continuous variables). The MMT status of CHWs (i.e. with vs. without MMT experiences) was based on their real experience, not based on the status of their current CHCs. If a CHW who worked at a CHC without MMT had been involved in MMT program in the past, he or she was categorized as "ever in MMT". We also assessed the Pearson correlation between CHWs' confidence in providing MMT services and its potentially related continuous characteristics and scales.

Second, we conducted three multilevel regression models to explore factors associated with CHWs' confidence in providing MMT services among all participants and among subgroups by their MMT status (i.e. ever vs. never in MMT). Multilevel regression models would be appropriate to deal with our correlated sample in which several CHWs came from the same CHCs and CHCs were under districts. Variables were included in the models based on their

associations with the main outcome from the literature and from our data (statistically significant level was set at $\alpha = 0.05$). All models were controlled for participants' background characteristics including age, gender and ethnicity, and commune-level characteristics including ART provision status of CHCs and number of ethnicity groups in the CHCs' catchment area. In the model among the whole study population, two-way interaction terms between CHWs' MMT status and other characteristics were included to check the potential effect modification of MMT status on the association between confidence in providing MMT services and CHWs' characteristics. All analysis was performed in SAS software version 9.4 (SAS Institute, Inc., Cary, NC).

Results

Socio-demographics and professional characteristics of the study participants

There was no refusal in the study. Among 276 CHWs participated in the study, 135 (48.9%) were female and 200 (72.5%) were doctors or assistant doctors. The average age was 34.4 years (SD 7.9) and average time in the medical field was 10.4 years (SD 7.7). 114 CHWs (41.3%) had ever been involved in MMT program either through management or clinical practice. The two most popular ethnicity groups were Thai (51.5%) and Kinh (37.7%). The difference in ethnicity distribution between CHWs who had ever worked in MMT and those who had never done so was statistically significant. While the Kinh group constituted 46.5% of the CHWs ever in MMT, they only accounted for 31.5% of the CHWs never in MMT. In terms of education, 44 (15.9%) had at least 4 years of medical education.

Of the whole study population, 61.3% had ever had substance use disorder (SUD)-related training and 72.8% had HIV-related training, While 62.3% CHWs ever in MMT had received at

least one SUD-related training course, 63.0% CHWs never in MMT had never been trained about this topic. The average number of PWUD seen a month was 19.7 (SD 25.7) among the total population. CHWs ever in MMT saw more PWUD on average (35.8, SD 28.3) compared to those never in MMT (8.3, SD 15.8).

Confidence in providing MMT services and its related knowledge and perception of CHWs in the whole sample and of CHWs ever and never in MMT

Table 3.7 showed confidence in providing MMT services of CHWs by their demographic and background groups among the whole sample and among subgroups by MMT status. CHWs who were doctors or assistant doctors and who had received more than one SUD-related training course were more confident in providing MMT services compared to others (i.e. those were not doctors/assistant doctors and had received less training). There was no difference in confidence between CHWs by gender, ethnicity, education level and HIV-related training among the whole population. CHWs ever in MMT were mostly more confident than CHWs never in MMT of the same characteristics. However, for CHWs who had received no SUD-related training and whose ethnicity were not Kinh or Thai, there was similar confidence between the two groups regardless of their MMT experiences.

Table 3.8 demonstrates the average score and standard deviation of CHWs' confidence in providing MMT services and its potentially related knowledge, attitude and perceptions. The average score of confidence levels was 45.0 (SD 12.0) and was higher among CHWs ever in MMT than those never in MMT (mean scores 50.3 vs. 41.2, $p<0.001$). The participants provided of the whole sample on average 13.2 correct answers (SD = 3.2; range: 0 – 19). CHWs with experiences working in MMT, compared to those without these experiences, had significantly

better MMT knowledge and belief in harm reduction, higher perceived work-related support. Although the empathy towards PWUD and perceived risk in working with PWUD had no difference between CHWs ever and never in MMT, CHWs never in MMT exhibited more perceived stigma of working with PWUD than those ever in MMT (mean scores 12.5 vs. 11.1, p=0.012).

Correlation of the continuous variables and scales of interest

We identified statistically significant correlations in several pairs of variables and scales (Table 3.9). For example, number of PWUD seen a month was positively associated with belief in harm reduction (r=0.22, p<0.001) and MMT knowledge (r=0.30, p<0.001); perceived stigma in working with PWUD was associated with number of PWUD seen a month (r=-0.22, p<0.001), perceived work-related support (r=-0.23, p<0.001), empathy towards PWUD (r=-0.35, p<0.001), or perceived risk of working with PWUD (r=0.27, p<0.001). CHWs' confidence in providing MMT services was associated with their number of PWUD seen a month (r=0.30, p<0.001), MMT knowledge (r=0.35, p<0.001), belief in harm reduction (r=0.15, p<0.05), and perceived work-related support (r=0.34, p<0.001).

Factors associated with confidence in providing MMT services of CHWs in the whole sample and of CHWs ever and never in MMT

The results of three multilevel regression models on CHWs' confidence in providing MMT services were presented in Table 3.10. In the first model that took into account all participants, CHWs' confidence in providing MMT services was associated with their job position (i.e. doctor/assistant doctor vs. others) (β = 3.60, 95% CL: 0.85; 6.35), MMT knowledge (β = 0.75, 95% CL: 0.30; 1.20), and perceived work-related support (β = 0.66, 95% CL: 0.39;

1.93). Although the main effect of having ever worked in MMT (β = 3.08, 95% CL: -0.72; 6.87) was not associated with confidence in providing MMT services, the main effect of having at least 4 years of medical education (β = -5.71, 95% CL: -10.34; -1.07) and the interaction between the two factors (i.e. CHWs' MMT status and education level) (β = 8.68, 95% CL: 2.21; 15.15) were significantly associated with the main outcome. These results suggested opposite associations between confidence and education levels in CHW subgroups of MMT status. Among CHWs never in MMT, those with higher education showed a lower confidence level on average; however, among CHWs ever in MMT, those with higher education expressed a higher level of confidence. Similar results were observed in the stratified models by CHWs' MMT experience. There was a negative association between confidence and education levels among CHWs never in MMT (β = -5.80, 95% CL: -11.22; -0.39) and a positive one, although not statistically significant, among CHWs ever in MMT (β = 2.72, 95% CL: -1.06; 6.49). MMT knowledge was associated with confidence among CHWs never in MMT (β = 0.90, 95% CL: 0.29; 1.51) but not among those ever in MMT (β = 0.30, 95% CL: -0.38; 0.99). In contrast, perceived work-related support was positively associated with confidence among both CHWs ever (β = 0.71, 95% CL: 0.35; 1.08) and never in MMT (β = 0.58, 95% CL: 0.19; 0.96).

Discussion

CHWs with MMT experience were different from those without MMT experience in several characteristics including their SUD-related training experience. The government requires healthcare providers to undergo an accreditation methadone training course before they could start working in the MMT program. Later, they may get more advanced or continued training depending on their needs and the national/local resources. Moreover, within harm reduction programs, CHWs may receive several non-accredited trainings on drug information (mainly

about opioids), other SUD treatment including detoxification or traditional medicine and benefits of needle exchange and condom distribution. This would help CHWs to better conduct awareness-raising activities and be able to provide opioids detoxification treatment at the community if needed. However, we noted from our study that some providers had been involved in MMT programs without the required training. All these CHWs provided support in dispensing methadone doses or did some counselling with patients. As MMT programs continue to expand down to the commune level, we should pay more attention to ensure the quality of the clinical staff.

There were also differences in confidence in providing MMT services and MMT knowledge, perception, and support between CHWs with different experience in MMT program. Unsurprisingly, CHWs ever in MMT were more confident in providing MMT services and had more accurate knowledge about MMT. They also believed more in harm reduction and perceived less stigma from working with PWUD (Van Hout & Bingham, 2014). These factors are crucial for the success of the MMT program. Since MMT is a life-long treatment for addiction, a controversial disease for a highly stigmatized population, providers' belief in the chronic aspect of the disease and comfort in working with PWUD would help maintain their motivation in service. Moreover, real experiences in providing MMT may make providers more comfortable in providing care for PWUD in general and providing MMT in specific (Langton et al., 2000).

The confidence in providing MMT was associated with distinguished factors across different subgroups of CHWs, depending on their MMT experience. While the job position was an important factor associated with the confidence of CHWs ever in MMT, medical education levels played a role in confidence among CHWs never in MMT. Because of the under-emphasis on the psychological aspect of addiction, medication currently plays the most important part of

the MMT program in Vietnam. Doctors and assistant doctors are mainly responsible for physical examination and prescription of methadone and other medication. Although their medical training may not be sufficient to effectively work in SUD field, this background training in combination with the required accreditation MMT training would prepare them with some confidence in their MMT work (Ram & Chisolm, 2016). Moreover, the more they see SUD/HIV patients, the more confident they might be in working with PWUD (Lum et al., 2011). In contrast, providers in other position (i.e. counselors, nurses or pharmacists) may face challenges in their MMT-related jobs. For those who provide counseling for MMT patients, they may not have enough knowledge and skills before entering the program. Counseling on behavior changes was not included in the medical training. Moreover, there was still a need of more training for providers with a social work background to provide this behavior intervention at primary care (Horevitz & Manoleas, 2013). Although MMT providers receive basic training about psychological aspects of addiction before entering the program, a lack of background education may prevent them from feeling confident in counselling for challenging patients like PWUD. For pharmacist or dispensing staff, methadone is among the addictive medications that they could manage with their pharmacy training. However, dealing with drug-using patients under strict MMT-related legal regulations may put the staff under challenges. Concerns about safety, theft and burglary were the barriers for pharmacist to provide MMT (Fonseca et al., 2018). Among CHWs who had never been involved in MMT programs, we found that lower medical education levels were associated with higher confidence in providing MMT services. This result concurs with a previous study among CHWs in Vietnam in which more years of education associated with higher perceived difficulties in treating PWUD (Lin et al., 2018). Further studies should explore reasons for the perceived lower challenges and higher confidence of CHWs with lower

education and examine how their perceptions related to their actual practice. However, our results suggest intervention to improve the quality of MMT at the commune level should focus more on different subgroups to maximize its benefit.

The study, in line with previous literature, documented the important roles of MMT knowledge and technical support in CHWs' confidence in providing MMT services (Dooley et al., 2012; Livingston et al., 2018). In general, more MMT knowledge is associated with higher confidence in providing treatment. However, MMT knowledge only made CHWs with no MMT experience more confident. The results suggest that MMT knowledge only is not sufficient to build providers' confidence if they already have experience with the program. The required accreditation training would be helpful to equip providers with needed knowledge and skills and boost their confidence to work with drug-using patients. In addition, technical support is important for all CHWs to work with PWUD (Go et al., 2015). CHWs, regardless of their experience with MMT, would learn helpful strategies to work with PWUD from more experienced MMT providers and other addiction treatment specialists. Other studies also suggest the benefit of more training and specialist supervision to enhance the willingness and confidence in providing services of healthcare workers (Abera et al., 2014; Byrne et al., 2006; Kauye et al., 2014).

This study presents some understanding of CHWs' confidence in providing MMT in relation to their characteristics and professional background. However, the data was collected from one province. Thus, it is not representative of the whole country. Moreover, the cross-sectional design cannot help us to make causal inferences for the identified associations. Despite these limitations, our results suggest several factors that should receive attention in future studies and MMT quality improvement interventions.

Conclusion

CHWs with or without MMT experiences were different in their background characteristics, MMT-related knowledge and attitude including confidence in providing MMT services. Future interventions to improve CHWs' confidence should be tailored to their MMT experiences. MMT knowledge is important in preparing new MMT providers, but it is insufficient to build confidence in current MMT providers. Technical support regarding the work with PWUD would benefit all CHWs, regardless of their experiences in MMT. Our findings suggest that future interventions should provide continuing support for CHWs to improve MMT quality of care.

Table 3.1. Scale to measure confidence in providing MMT services

1	I am able to provide correct information about MMT program for people who use drugs in the community.
2	I am confident to counsel patients in the induction period.
3	I am confident in safely prescribing methadone for new patients.
4	I can always conduct successful routine check-up for methadone patients.
5	I am confident in appropriately adjusting methadone doses for patients.
6	If a patient skips his/her methadone doses, I am able to find out the reason.
7	If a patient skips his/her methadone doses, I know how to deal with dose adjustment if needed.
8	It is easy for me to detect early symptoms of opioid intoxication.
9	I am confident that I could deal efficiently with non-medical unexpected events such as violence among patients or between patients and providers.
10	I can solve most problems related to methadone dosing, such as taking wrong doses or vomiting after taking doses.
11	I am comfortable talking to MMT patients about their life problems.
12	I am able to manage patients with occasional opioid use or the use of other drugs like alcohol.
13	I can help patient to build their relapse prevention skills.
14	I can successfully handle all the paperwork related to MMT program.
15	I can successfully store and manage methadone in my CHC.

Table 3.2. Scale to measure MMT knowledge

1	Methadone is used orally.	T
2	Methadone maintenance can cause chronic constipation.	T
3	MMT can damage the kidneys.	F
4	MMT can damage the liver.	F
5	MMT reduces addicts' cravings for opioids.	T
6	MMT is effective in treatment of stimulant users.	F
7	MMT reduces the risk of HIV infection.	T
8	MMT reduces addicts' criminal activities.	T
9	MMT decreases addicts' mortality risk.	T
10	MMT increases the severity of preexisting depression.	F
11	MMT generally requires patients to visit the dispensing clinic on a weekly basis.	F
12	Methadone, when given in a maintenance treatment, can introduce the same euphoria as heroin does.	F
13	Patients with serious liver or kidney dysfunction can start MMT with close observation.	F
14	Patients who are on ARV may need an adjustment in the methadone dose.	T
15	The main symptoms of methadone overdose include coma, pinpoint pupils and slow breathing.	T
16	Oral naloxone is used to treat methadone overdose.	F
17	To the unborn child, methadone is more dangerous than heroin.	F
18	Methadone given in a stable dose as part of a maintenance regime significantly interferes with the ability to drive a vehicle.	F
19	A long-term treatment with sufficient dosage is a basic requirement for MMT.	T
20	Psychosocial support is needed in methadone treatment.	T

Table 3.3. Scale to measure belief in harm reduction

1	Substance abuse is a chronic disease.
2	Relapsing individuals should be allowed to remain in MMT for substance abuse.
3	All narcotics users wanting MMT should receive them.
4	Reducing the harmful consequences of substance abuse is as important as achieving abstinence.

Table 3.4. Scale to measure perceived work-related support

1	If I felt the need when working with drug users, I could easily find someone with whom I could discuss any personal difficulties that I might encounter.
2	If I felt the need when working with drug users, I could easily find someone who would help me clarify my professional responsibilities.
3	If I felt the need, I could easily find someone who would be able to help me formulate the best approach to a drug user.

Table 3.5. Scale to measure perceived stigma of working with PWUD

1	You suffer discrimination or stigma outside of work due to the fact that you work in a substance abuse related field.
2	Some friends have had less contact with you since you started working with PWUD.
3	People move away from you at social functions when they hear that you work in the field of substance abuse.
4	Your family is unhappy that you are working in the field of substance abuse.
5	You suffer discrimination or stigma from other health care staff due to the field in which you work.
6	You feel that PWUD should be treated exclusively by a specialist.

Table 3.6. Demographic and background characteristics of participants, overall and by MMT status (N= 276)

Characteristics	Total (N=276)	Ever in MMT		p
		Yes (N=114)	No (N=162)	
Mean (SD)				
Age	34.4 (7.9)	33.8 (8.0)	34.8 (7.9)	.278
Years in medical field	10.4 (7.7)	10.1 (8.2)	10.6 (7.3)	.573
Number of PWUD seen in a month	19.7 (25.7)	35.8 (28.3)	8.3 (15.8)	<.001
N (%)				
Gender				
Male	141 (51.1)	55 (48.2)	86 (53.1)	.428
Female	135 (48.9)	59 (51.8)	76 (46.9)	
Ethnicity				
Kinh	104 (37.7)	53 (46.5)	51 (31.5)	.013
Thai	142 (51.5)	54 (47.4)	88 (54.3)	
Other	30 (10.8)	7 (6.1)	23 (14.2)	
Job position				
Doctor/Assistant doctor	200 (72.5)	76 (66.7)	124 (76.5)	.071
Other	76 (27.5)	38 (33.3)	38 (23.5)	
Highest medical education				
≥ 4 years	44 (15.9)	24 (21.1)	20 (12.4)	.052
< 4 years	232 (84.1)	90 (78.9)	142 (87.6)	
SUD-related training				
≥ 2 training	96 (34.8)	71 (62.3)	25 (15.4)	<.001
1 training	73 (26.5)	38 (33.3)	35 (21.6)	
Never	107 (38.7)	5 (4.4)	102 (63.0)	
HIV-related training				
Ever	201 (72.8)	89 (78.1)	112 (69.1)	.101
Never	75 (27.2)	25 (21.9)	50 (30.9)	

PWUD, People who use drugs; SUD, substance use disorder; HIV, human immunodeficiency virus

Table 3.7. Confidence in providing MMT services by participants' demographic and background groups, overall and by MMT status (N= 276)

	Overall (N=276)		Ever in MMT, Mean (SD)		
Characteristics	**Mean (SD)**	**p**	**Yes (N=114)**	**No (N=162)**	**p**
Gender		.484			
Male	45.5 (12.4)		52.3 (8.4)	41.1 (12.6)	<.001
Female	44.5 (11.7)		48.4 (9.2)	41.4 (12.5)	<.001
Ethnicity		.638			
Kinh	45.8 (11.9)		50.4 (8.8)	40.9 (13.0)	<.001
Thai	44.7 (12.4)		50.3 (9.4)	41.3 (12.8)	<.001
Other	43.6 (10.6)		49.6 (9.1)	41.7 (10.5)	.088
Job position		.050			
Doctor/ Assistant doctor	45.9 (12.)		52.6 (7.4)	41.7 (12.5)	<.001
Other	42.7 (11.8)		45.7 (10.2)	39.6 (12.7)	.022
Highest medical education		.939			
≥ 4 years	45.1 (13.6)		53.8 (6.0)	34.7 (12.8)	<.001
< 4 years	45.0 (11.8)		49.4 (9.5)	42.2 (12.2)	<.001
SUD-related training		<.001			
≥ 2 training	48.5 (10.4)		50.5 (9.1)	42.5 (11.5)	<.001
1 training	47.2 (10.1)		50.5 (8.7)	43.7 (10.5)	.004
Never	40.3 (13.2)		45. 8 (10.6)	40.1 (13.3)	.346
HIV-related training		.141			
Ever	45.6 (11.8)		51.1 (8.6)	41.3 (12.2)	<.001
Never	43.2 (12.5)		47.4 (10.0)	41.2 (13.2)	.043

SUD, substance use disorder; HIV, human immunodeficiency virus

Table 3.8. Confidence levels in providing MMT services and related scales of participants, overall and by MMT status (N= 276)

	Theoretical range	Actual range	Overall, Mean (SD) (N=276)	Ever in MMT, Mean (SD)		p
				Yes (N=114)	No (N=162)	
MMT knowledge	0 – 20	0 – 19	13.2 (3.2)	15.0 (2.1)	11.9 (3.2)	<.001
Belief in harm reduction	4 – 16	6 – 16	12.9 (1.9)	13.3 (1.9)	12.7 (1.9)	.014
Perceived work-related support	3 – 21	3 – 21	15.5 (4.5)	16.3 (4.1)	14.8 (4.7)	.007
Empathy towards PWUD	20 – 100	51 – 100	76.4 (9.6)	75.5 (8.4)	77.1 (10.4)	.167
Perceived stigma of working with PWUD	6 – 30	6 – 29	11.9 (4.5)	11.1 (4.6)	12.5 (4.4)	.012
Perceived risk of working with PWUD	4 – 20	4 – 20	11.5 (3.8)	11.1 (3.7)	11.8 (3.8)	.110
Confidence in providing MMT services	15 – 60	15 – 60	45.0 (12.0)	50.3 (9.0)	41.2 (12.5)	<.001

PWUD, People who use drugs; MMT, methadone maintenance treatment

Table 3.9. Pearson correlation coefficients of interested continuous variables and scales (N=276)

Variables	1	2	3	4	5	6	7	8	9
1. Age									
2. Years in medical field	0.82[c]								
3. Number of PWUD seen monthly	0.02	0.03							
4. MMT knowledge	-0.01	0.04	0.30[c]						
5. Belief in harm reduction	0.14[a]	0.08	0.22[c]	0.08					
6. Perceived work-related support	0.07	0.09	0.17b	0.15[a]	0.17[b]				
7. Empathy towards PWUD	-0.05	-0.04	-0.02	-0.10	0.23[c]	0.19[b]			
8. Perceived stigma of working with PWUD	-0.03	-0.10	-0.22[c]	-0.12	-0.23[c]	-0.23[c]	-0.35[c]		
9. Perceived risk of working with PWUD	-0.09	-0.13[a]	-0.03	-0.06	-0.03	-0.01	-0.10	0.27[c]	
10. Confidence in providing MMT services	0.04	0.04	0.30[c]	0.35[c]	0.15[a]	0.34[c]	0.12	-0.09	-0.04

PWUD, People who use drugs; MMT, methadone maintenance treatment; [a]p<0.05; [b]p<0.01; [c]p<0.001

Table 3.10. Multilevel regression analysis on CHWs' confidence in providing MMT services, overall and by MMT status (N=276)

	Overall (N=276)			Ever in MMT (N=114)			Never in MMT (N=162)		
Variables	**β**	**95% CL**	**p**	**β**	**95% CL**	**p**	**β**	**95% CL**	**p**
Doctor/Assistant doctor vs. Other	3.60	0.85; 6.35	.011	5.17	1.95; 8.40	.002	2.52	-1.90; 6.94	.261
≥ 4 years medical education vs. Lower	-5.71	-10.34; -1.07	.016	2.72	-1.06; 6.49	.155	-5.80	-11.22; -0.39	.036
Ever in MMT	3.08	-0.72; 6.87	.111	-	-	-	-	-	-
Ever in MMT*Graduate education	8.68	2.21; 15.15	.009	-	-	-	-	-	-
SUD-related training									
≥ 2 training	1.11	-2.48; 4.70	.543	2.92	-4.41; 10.26	.429	1.35	-4.15; 6.85	.628
1 training	2.36	-1.02; 5.73	.170	3.88	-3.53; 11.29	.230	2.76	-1.79; 7.32	.232
Never	Ref	-	-	Ref	-	-	Ref	-	-
Number of PWUD seen monthly	0.04	-0.02; 0.10	.152	0.04	-0.02; 0.09	.194	0.03	-0.09; 0.15	.654
MMT knowledge	0.75	0.30; 1.20	.001	0.30	-0.38; 0.99	.381	0.90	0.29; 1.51	.004
Belief in harm reduction	0.34	-0.30; 0.98	.302	0.21	-0.59; 1.00	.606	0.40	-0.58; 1.38	.419
Perceived work-related support	0.66	0.39; 0.93	<.001	0.71	0.35; 1.08	<.001	0.58	0.19; 0.96	.004

PWUD, People who use drugs; MMT, methadone maintenance treatment; SUD, substance use disorder
All models adjusted for age, gender, ethnicity of CHW, ART status of CHC, number of ethnicity group in each commune

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Chapter 4: Challenges of MMT decentralization from Vietnamese community health workers' perspectives

Abstract

Background: Decentralizing methadone maintenance treatment (MMT) to primary care has shown to be effective in improving patients' accessibility and treatment outcomes. However, providers at primary care are facing several challenges in providing MMT services under these low-threshold settings. The study aims to explore multileveled challenges perceived by community health workers (CHW) in their MMT responsibilities at primary care (i.e. commune health centres, CHC) in Vietnam.

Methods: We conducted in-depth interviews with 26 CHWs at 8 CHCs in Dien Bien province in November and December 2019. All participants were currently working in MMT program at CHCs as program managers, doctors, counsellors, pharmacists, and medication dispensing staffs. Data was explored using Ground theory approach and thematic analysis on ATLAS.ti.

Results: Participants identified major challenges in providing MMT services in CHCs at multiple levels. At individual-level was the lack of confidence and motivation in providing MMT; clinic-level factors included inadequate human resource, lack of institutional support, insufficient technical support, lack of referral resources and additional support for patients; environment-level factors were the lack of policies to support the MMT program at CHCs and to protect service providers. Suggestions from CHWs for better implementing medication-assisted treatment for opioid use disorders were also reported.

Conclusion: CHWs in Vietnam were facing multileveled challenges in their MMT provision. Supportive policies and additional resources are needed to ensure the effectiveness of the decentralization program.

Keywords: Methadone maintenance treatment, challenges, community health workers, primary care, Vietnam

Introduction

Methadone maintenance treatment (MMT) was first implemented in 1960s in the United States and has become the most important treatment of opioid dependence (Joseph et al., 2000; WHO, 2017). Extensive literature has proved the effectiveness of MMT in reducing illicit opioid consumption and related harm including mortality and criminality as well as increasing the quality of life of people who use drugs (PWUD) (Fullerton et al., 2014; Gowing et al., 2011; Mattick et al., 2009; Sun et al., 2015; Volkow et al., 2014). In 2005, WHO official listed methadone among the essential medicines for substance use disorders (Herget, 2005). MMT is also an effective HIV prevention strategy as it reduces drug-related HIV risk behaviors and increases antiretroviral therapy (ART) uptake, adherence and treatment outcomes (Fullerton et al., 2014; Gowing et al., 2011; Low et al., 2016; Uhlmann et al., 2010).

Methadone delivery models vary greatly across the world. In the United State, methadone is mostly delivered in highly regulated, narcotic treatment settings, while buprenorphine can be provided in primary care due to its safety profile (Korthuis et al., 2017; Rawson et al., 2019). In other countries like Switzerland, Scotland and Australia, methadone can be provided by primary care providers (PCP) (Greenwood, 1996; Klingemann,1996; Krantz & Mehler, 2004; Poloméni et al., 2015; Strang et al., 2005; Weinrich & Stuart, 2000). The major advantages of this model include improving patients' access to the program by increasing the number of entry points and enabling the scale-up possibility of programs in rural areas where specialized settings may be not available or with limited access (Van Hout et al., 2018). Follow-up studies comparing methadone treatment provided by the two models suggested that patients at primary care might have better engagement and retention in treatment and more favorable treatment outcomes (e.g. less drug use

and fewer psychological problems) than those receiving methadone at specialized settings (Carrieri et al., 2014; Gossop et al., 2003).

Several challenges and barriers have been reported by PCPs working with PWUD and providing MMT. Several PCPs are reluctant to work with drugs dependent patients and to provide MMT (Abouyanni et al., 2000; Turner et al., 2005; Van Hout et al., 2018). PCPs are likely to be more willing to provide methadone if they have personal experience with methadone program and with patients with chronic pain or if they have positive attitude towards PWUD and MMT (Livingston et al., 2018; Turner et al., 2005; Van Hout et al., 2018). PCP also worry about their personal safety due to their perception of patients' demanding and aggressive manners (Abouyanni et al., 2000; McKeown et al., 2003). In addition, the majority of PCPs concern about their insufficient qualification (Dooley at al., 2012). They stress on the importance of more training on methadone, better knowledge of psychiatric pathologies of addiction and continuing support from specialist professionals (Livingston et al., 2018; McNeely et al., 2000; McKeown et al., 2003; Pelet et al., 2005; Schulte et al., 2013). For clinical practice, due to the complex nature of addiction, PCPs commonly suggest an interdisciplinary approach to reduce their workload and time spending with patients, and also to improve their treatment quality (Langton et al., 2000; McKeown et al., 2003; Pelet et al., 2005; Schulte et al., 2013; Van Hout & Bingham, 2014). At the structural level, PCPs consider the inadequate coverage of MMT and the lack of a mentoring system for younger providers to be systemic barriers for the program (Van Hout et al., 2018). Another concern was about the financial remuneration policy which would provide an important motivation for PCPs to work in MMT (Pelet et al., 2005; Schulte et al., 2013; Van Hout et al., 2018).

MMT, after having been successfully piloted in 2008, has become the national standard treatment for opioid use disorder in Vietnam from 2010 (Nguyen et al., 2012). By October 2019, MMT was available in all 63 provinces with 335 clinics and 52,200 patients in treatment (Ministry of Health, 2019). This number, however, only account for about 65% of the government's 2015 target number of 80,000 patients in treatment. Several studies showed low adherence and high drop-out rates overtime, especially in remote and mountainous area (Dao et al., 2018; Nguyen et al., 2017). In a 36-month follow-up study, the dropout rate was reported as high as 33.3% due to several reasons including overdose deaths, police arrests for drug-related crimes, side effects, and lack of motivation to continue with treatment (Khue et al., 2017).

Since 2015, the Vietnam Ministry of Health started decentralizing MMT to primary care to improve patients' access to and retention in MMT care (Ministry of Health, 2015). The decentralization model has been implemented following the "hub and spoke" model for buprenorphine in the United State (Rawson et al., 2019). "Hubs" are main MMT clinics locating at district level that are responsible for recruiting and inducing patients on methadone. Once patients are stabilized, they will be referred to primary care (i.e. CHC at commune level) for ongoing maintenance. "Hubs" are also in charge of complex cases with significant comorbidities or with concurrent illicit drug use. If patients appear to be instable during their treatment at CHCs, they may be referred back to the main clinics until they regain their stability. CHCs in Vietnam are responsible for dispensing methadone for stable patients but not for inducing new patients, unlike the primary care treatment models in Australia and European countries (Greenwood, 1996; Klingemann,1996; Krantz & Mehler, 2004; Ministry of Health, 2015; Poloméni et al., 2015; Strang et al., 2005).

As of 2019, there were 227 methadone dispensing sites at CHCs nationwide, mainly in remote and/or mountainous provinces (Ministry of Health, 2019). Health care providers (i.e. CHWs) at these CHCs provide both basic health care at the grassroots level and outreach and home-based care in their community (e.g. go to villages to provide health education and home-based vaccination). Therefore, the CHWs in Vietnam with our unique model may face different challenges from their work at primary care settings than their colleagues in Western countries. This study aims to document perceived challenges of CHWs related to their responsibilities in MMT program. The study results would be used to improve the effectiveness of Vietnam's decentralization model and provide recommendations for future interventions to improve MMT decentralization system in general.

Methods

Study sites and participants

The study was conducted in Dien Bien, a mountainous province in the Northwest of Vietnam in November and December 2019. Due to its large drug injection-driven HIV epidemic and commuting difficulties, Dien Bien was among the first provinces to implement providing MMT at CHCs. Among 29 CHCs that provided MMT services, 8 CHCs were purposely chosen to ensure diversity in geographic areas (i.e. urban vs. rural), current number of MMT patients and years of providing MMT services. CHWs were eligible to participate in the study if they 1) were at least 18 years old, 2) had been working in the current CHCs for more than 3 months and 3) were currently involved in MMT program, either in management or clinical practice. Eligible participants were informed of the study objectives, procedures, risks and benefits before providing a verbal informed consent to participate in the study. The Institutional

Review Boards of University of California, Los Angeles, United States and Hanoi Medical University, Vietnam approved the study.

No one declined to participate in our study. Of all 26 participants, 14 (53.8%) were female, 18 (69.2%) were of Kinh ethnicity (the largest ethnicity in Vietnam), and 13 (50%) age ranging between 30 – 39 years. Regarding participants' positions in the MMT program, eight (30.8%) were managers, 5 (19.2%) were doctors, 6 (23.1%) were counselors, and 10 (38.4) were pharmacists or medication dispensing staffs. Some program managers also worked as MMT doctors or counselors. Only 5 doctors had graduate medical education; the others had 3 years or less of medical education. At the time of the study, 13 (50%) had one to 3 years and 9 (34.6%) had more than 3 years of experience in MMT program. (Table 4.1)

Data collection

After enrollment, participants completed an in-depth interview with a trained interviewer in a private space at their CHCs. A semi-structure interview guide with open-ended questions was used to probe participants' opinions about MMT program at CHCs and its related issues. The interview guide was developed based on the four-level healthcare system theoretical framework and targeted the following domains: 1) background information including job responsibilities, 2) received training and training needs, 3) the setup process of MMT services and working procedures of each position at the CHCs, 4) personal opinions about MMT and MMT decentralization, 5) perception of technical support from and working relationship with MMT staff in the main clinics and other specialists, 6) financial and institutional support, 7) relationship with local residences and public security, 8) opinions about policy and regulations related to MMT decentralization, 9) other perceived challenges in MMT decentralization in

general and in their daily practice, and 10) their suggestions for improvements. Demographic data (age, gender, education, and years of experience) were collected at the beginning of each interview. No name or other personal identifiable information were collected. Interviews lasted approximately 90 – 120 minutes and were audio-recorded. Participant received 200,000 VND (approximately 10 USD) for their time and effort.

Data analysis

The completed in-depth interviews were audiotaped and transcribed verbatim in Vietnamese. The interviewer read through all the transcripts to make sure there was no vague content and removed any identifiable information before analyzing the data (e.g. interviewers or interviewee might accidently mentioned interviewee's name during the interview). Data was analyzed using the Grounded theory and thematic analysis approach (Glaser & Strauss, 2017). An initial set codes was developed based on the topics of interests and interview notes of interviewers before examining the data. This coding frame was applied to examine data and then revised as new themes emerged from the close reading throughout the analysis process. The themes that were relevant to the research questions were extracted. A matrix was developed to display identified challenges and improvement strategies reported by the participants. The data was analyzed using the ATLAS.ti 8 software (Berlin, Germany).

Results

From the interviews, we learned that current practices of MMT at CHCs might be quite flexible and different from what was expected. The "hub and spokes" model assumed that new patients would start their treatment under the supervision of the methadone doctors of the main clinics, whether at these clinics or at CHCs. In the latter case, methadone doctors from the

district clinics would go to CHCs to do so. These doctors would follow new patients until they are stable. However, for different reasons, CHC doctors had to assume these responsibilities. They also had to manage complicated cases and rarely refer patients back to the main clinic for travel difficulties.

We categorized challenges perceived by CHWs into three levels which are (1) individual level including factors directly related to CHWs themselves, (2) clinic level or work environment including factors at clinic level or directly related to their MMT work at CHCs, and (3) environmental level including structural factors at macro level.

Perceived challenges of CHWs at different levels

Individual level

The main individual-level challenges for providing MMT at CHCs consisted of practitioners' lack of confidence and of motivation to work with methadone patients. These challenges resulted from a suboptimal working condition.

1) Lack of confidence to provide care for MMT patients

Unmet technical support needs were the main reason for participants' lack of professional confidence in MMT. Although most CHCs had provided MMT for at least 2 years, most practitioners had only received the accreditation training on MMT that consisted of one-week classroom training and another week of observation and practicum in a methadone clinic. This knowledge, however, was insufficient for them to deal with daily clinical issues.

"Sometimes patients tell me that they took such and such medications and ask if it's ok. We need more training to be able to answer them." (Female, 33 years old, medication dispensing staff, 1.5 years MMT experience)

While CHWs were supposed to take care of stable patients only, some programs that located far from the district center still need to conduct patient induction and dose adjustment due to patients' travel difficulties. This made their needs for training and technical support more pronounced.

"I want to learn counseling. I mean… learn everything again from the beginning. I want to know about the most updated counseling strategies. Because what I'm doing now with the addict patients is not very effective." (Female, 29 years old, counselor, 4 years of MMT experience)

"In fact, we only got very basic training. […] Moreover, since we don't have many patients, we don't use this knowledge very often. Sometimes we forget, sometimes the issue is not clearly explained in the training materials. Many regulations are changing and we cannot keep up with all of them." (Male, 34 years old, clinic head and doctor, 2 years of MMT experience)

Since the accreditation training was insufficient, it was challenging for providers to apply what they learned to actual encounters with patients.

"While I provide them with counseling, I feel like they are not really open to me. Maybe it's because of the way I ask questions." (Female, 31 years old, counselor, 1.5 years of MMT experience)

"I want [to learn more about] counseling. I have been trained but only for one week. I can't do counseling as well as I was taught. They taught 10 but I can do only 5 or 6." (Female, 54 years old, clinic head, 4 years of MMT experience)

They were also not confident in dealing with unusual clinical situations like opioid overdose.

"We don't have many patients, so we don't have a lot of experiences. I've been working in the program for 4 years, but I've never seen opioid overdose. I know I'll need to use Naloxone, but I've never practiced it. So… I'm not so sure of myself." (Female, 29 years old, counselor, 4 years of MMT experience)

The challenge to provide quality care was heightened by providers' difficulties in communication with patients and their family members. While many CHWs were of Kinh ethnicity (the largest ethnic group in Vietnam), most of their patients came from ethnic minorities and were not fluent in the national language.

"I don't know if people from other ethnic groups understand everything I say. They say "ok" but... I don't know [if they understand]. They go to a counseling session, but they don't say much." (Female, 31 years old, counselor, 1.5 years of MMT experience)

The accreditation MMT training hypothesized that each provider would have her own responsibilities in the clinic as it had separate courses for physicians, counselors, and pharmacists. However, in reality, CHWs in most CHCs had to assume different positions due to their human resource shortage. For example, counselors might also dispense medication when they had no clients. Vice versa, pharmacists could do counseling when their colleagues were

unavailable. These staffs could also help physicians to write daily prescriptions and fill out medical records.

"I'd like to be trained on counseling, because I'm still providing patients with counseling without a counseling certificate. I'm afraid that what I'm doing is not correct." (Female, 27 years old, medication dispensing staff, 4 years of MMT experience)

Moreover, as all clinical activities were now required to be managed online, some CHWs felt they were not competent to do the job.

"I really want to receive more training on that software because everything now is registered online, even counseling. […] We've already been trained before we started but during that two-day training, we needed to learn about the whole software package and medical records. How could we digest everything?" (Female, 29 years old, counselor, 4 years of MMT experience)

2) Lack of motivation to work in MMT programs

Working in the MMT program was not the choice of most providers. They were assigned there by their supervisors. Many considered working in MMT to be a burdensome responsibility with no benefit or interest.

"I did not choose to join this program. Since we were unable to recruit more people, my director sent me to the training to assume the job. […] I didn't find anything good in this job. Since I have to see more people with comorbidities, I'm more at risk to contract diseases." (Female, 31 years old, counselor, 1.5 years of MMT experience)

"That work is obligatory! We have to work at weekends and holidays. And we can't hardly count the extra hours. It takes a lot of time. […] Most of us live at more than 10 km from the clinic." (Male, 34 years old, clinic head and doctor, 2 years of MMT experience)

As the above doctor complained, a MMT job was demanding. Because of the daily dosing schedule, staffs had to give up on their days off. Given that most providers lived far from the CHCs, commute time was significant.

"At weekends, I finish work at around 9 a.m. and go home at 10 a.m. 100 kilometers both ways. I sleep here Friday night and go home on Saturday morning after work, then I come back here on Sunday." (Male, 31 years old, clinic head and counselor, 2 years of MMT experience)

Providing MMT was only one of the many responsibilities that CHWs at CHCs had to undertake. However, this took a lot of their time, especially when they had to assume the work of the "hub" clinic to induce patients on the medication. This heavy workload undermined the quality of their treatment.

"In CHCs like mine, we have a lot of responsibilities, and it's very difficult to do MMT well. Sometimes I have to examine the patients during the day and fill out their medical records at night." (Male, 34 years old, doctor, 1 year of MMT experience)

Concern for personal safety is another reason for providers' unwillingness to work in MMT programs. Worries about the patients' potential violence in case of conflicts with staff were common.

"These addict patients are kind of reckless. I'm quite afraid of them. If we raise our voice, if we argue with them, they're ready to pull their knives out of their pockets. Some do bring knives with them." (Female, 34 years old, clinic head, 3 years of MMT experience)

Providers might also worry about the health risks of working with PWUD and of daily contact with methadone:

"TB patients, for example, we see them every day at the dispensing counter. Our risk is high. I feel quite uneasy with that." (Female, 39 years old, pharmacist, 3 years of MMT experience)

"[Methadone] is quite toxic. Because I dispense methadone, I've to inhale it. If I skip work 2, 3 days, I feel like I'm addicted to it already. I feel tired… dizzy…, especially when I'm not well." (Female, 46 years old, pharmacist, 4 years of MMT experience)

These concerns, however, seemed to reduce as CHWs have more experience in working with PWUD.

"At first, I didn't quit understand these addict patients. I felt quite a pressure. Then I started seeing them every day, providing them with counseling. I feel more at ease now. I know how to talk to them. When they get angry, I will shut my mounth… Willows are weak, yet they bind the wood. I'm almost no longer afraid of them now. I feel sympathy for them." (Female, 29 years old, counselor, 4 years of MMT experience)

<u>Clinic or working environment level</u>

3) Inadequate human resource

Medical doctors at CHCs were responsible for patient examination and methadone prescription. However, since doctors were scarce at commune level, they were likely to be the head of their CHCs and be responsible for other tasks. Such works required them to frequently travel away from the clinic while still having to be legally accountable for their methadone patients as the treatment physicians. This worried our participants.

"It's tiring to do a lot of part-time jobs. It's worrisome too. Whenever I travel for business, I'm so afraid that something might happen. Since I sign on prescriptions, if anything happens, I'll be in charge. I remember that day… it was the fourth day after the induction, the patient got a dose increase in the morning. His family brought him to the clinic in the afternoon and he was agitated. I was in a meeting in the district center. I had to direct people at home to try to recovery him… It's quite scaring." (Male, 36 years old, clinic head and doctor, 1.5 years of MMT experience)

Most CHCs at the time of our interviews had at least one full-time staff (with a one-year contract) for the MMT program. This setup had been effective when non-government organizations still supported the programs. However, as the financial support was reduced, provincial leaders considered removing this position; district leaders would decide when and how to do that. Most CHWs were worried about the situation, especially in CHCs with a large number of patients.

"Next years, many CHCs will need to integrate MMT into their existing programs. But to provide methadone every day for fifty or sixty patients, it'd take one full-time staff. After dispensing medication in the morning, in the afternoon, she'd need to enter information

into the medical records, create new records and complete other administrative works." (Female, 34 years old, clinic head, 3 years of MMT experience)

4) Lack of institutional support

How good the MMT decentralization depended much on the support of local leaders. Providers in some CHCs were frustrated for the lack of attention and support from their supervisors in recruiting patients and in ensuring safe working conditions for staffs. Monthly travels to the "hub" clinics that located in district centers to get methadone were a significant challenge for the pharmacists of these CHCs. Although methadone was a highly controlled medication of which any loss had to be reported and inquired, their supervisors did not provide them with safe transportation and other security measures. These pharmacists had to go by themselves and constantly worry about the methadone bottles they carried on the way.

"In general, my district director doesn't pay any attention to this treatment. When I sent him reports, he just asked about the number of patients. He said that if patients didn't pay treatment fees, we'd stop giving them medications. He'd never said we need to provide patients with more counseling… The commune leaders are even worse. I've never seen them here. We have requested commune staffs to go with us to villages to provide people with information, but they've never cooperated with us." (Female, 32 years old, dispensing staff, 1.5 years of MMT experience)

Providers in the few CHCs that received good support from their supervisors and local leaders were much more satisfied and felt more motivated at work.

"The head of our CHCs is also the chief of the MMT clinic. He understands the treatment and supports us." (Female, 32 years old, dispensing staff, 1.5 years of MMT experience)

"The leaders of this district care a lot about methadone and other harm reduction programs. They truly appreciate this treatment. They ensure that we can use our leaves. They send us to trainings and pay us for our extra-working hours." (Male, 28 years old, pharmacist, 4 years of MMT experience)

The solidarity among coworkers somehow counteracted the lack of institutional support in many CHCs. Although everyone was busy, providers in MMT programs provided support for each other in their daily tasks.

"Our colleagues from another service could come over to help us with methadone dispensing and vice versa, we'd help them when we're available." (Male, 28 years old, pharmacist, 4 years of MMT experience)

"Everyone supports me. Since my child is young, I asked my colleagues to start my workday 30 minutes later than everyone. During this time, T., my colleague, does the dispensing for me." (Female, 27 years old, medication dispensing staff, 4 years of MMT experience)

In terms of infrastructure, not all CHCs could meet the criteria of a standard MMT clinic with separated rooms for methadone dispensing, counselling, and doing urine test. Without privacy, it was difficult to ensure confidentiality in counseling. Some CHCs did not have a camera to keep track of the methadone storage and dispensing. This made their staffs worry about the safety of the medication they were in charge of. The lack of medical equipment and

important medications for emergency also made them feel incapable to provide quality care.

"If an overdose happens, it'd be very challenging. We have insufficient means to deal with it. We are also very far from the hospitals, it would take so long to call a taxi and driving patients on our motorbike is not safe." (Female, 26 years old, medication dispensing staff, 2 years of MMT experience)

Due to the restrained budget of MMT programs at CHCs, sometimes CHWs had to use their own money to pay for the program's running costs.

"We use a water purifier for patients. But when the electric bill increases, we have to pay for the extra costs out of our pocket." (Male, 31 years old, doctor, 1 year of MMT experience)

5) Insufficient technical support

Although CHWs at CHCs were assumed to receive technical support from the "hub" clinic when they needed it, there was no mechanism to ensure a systematic support.

"The staffs at the main clinic might not be available when I call them. […] They can help us only when they find some time, not when we need them most. It's like we ask for their favors. Their main job is not to provide technical assistance." (Female, 29 years old, counselor, 4 years of MMT experience)

Moreover, when support was available, it did not always meet CHWs' needs.

"We do everything. If we have questions on the procedures, we may call the main clinic, but they can't teach us skills or how to deal with actual cases. That's true. We can only

learn from our own experiences." (Male, 34 years old, clinic head and doctor, 2 years of MMT experience)

6) Lack of referral resources and additional support for patients

While one of the responsibilities of CHWs was to refer patients to appropriate specialty medical services, these services were not always accessible in the remote areas. Basic tests including screening for HIV and hepatitis and liver and kidney functions could be conducted for most patients at the intake checkup. However, there was generally no additional service like regular HIV, hepatitis test, on-site ART or tuberculosis screening. CHWs also had little information about local available resources. Moreover, even though CHWs referred patients to a clinic at upper levels, patients would not comply due to commuting difficulties and stigma concerns,

"I told them they should go to the district medical center to do their lab tests. However, they never go. They only come to ask us. They are fear of stigma." (Female, 26 years old, medication dispensing staff, 2 years of MMT experience)

"There is no actual support for patients. They need to find a job themselves. There is no agency that helps them with that." (Male, 34 years old, doctor, 1 year of MMT experience)

<u>Environmental or structural level</u>

7) Lack of supportive policies

Despite the decentralization of MMT at CHCs, this treatment had not been officially formulated in the CHWs' job descriptions. No regulation had clarified how the decentralized program would be implemented and how it would be staffed. Also, there was no formal regulation that allowed inducing new patients into MMT at dispensing sites.

"We need official documents stating that CHCs have to provide MMT and with such additional workload, what would be our compensation?" (Male, 34 years old, doctor, 1 year of MMT experience)

The decentralization of MMT might get into conflict with a criterion of "the new countryside" that requires villages to have no drug user. This might prevent PWUD in the community to disclose their drug use status and get into treatment.

Competition among MMT clinics in the area might undermine the decentralization. The "hub" clinics were reluctant to refer their patients to other clinics because they needed to meet their target number of patients. CHCs also needed to meet their target caseload to keep their staffs and maintain their activities. For example, a full-time position at CHCs could be removed if the number of MMT patients was below 30.

"The MMT clinic at the provincial AIDS center wants to keep their patients there. Because if they send patients to CHCs, they'd have not enough patients." (Male, 36 years old, clinic head and doctor, 1.5 years of MMT experience)

Most CHWs felt frustrated with the inadequate financial support for their work in the MMT programs. Although providers had to work over weekends and holidays to ensure the daily dosing schedule, they were paid only for less than half of the actual extra hours they had done.

The paid extra hours were decided by the number of MMT patients currently at CHCs, not their actual working hours. The labor law that had been established before MMT programs also set a ceiling to the number of extra hours they could be paid (200 hours per providers per year). With additional responsibility, they did not get any bonus either.

"That requirement that we cannot get paid for more than 200 extra hours is unjust. It should calculate our hours differently. […] For us, it's like working for nothing." (Female, 46 years old, pharmacist, 4 years of MMT experience)

Although healthcare staff who work with high-risk populations including HIV and PWUD were entitled for extra allowance, in methadone programs, only the doctor position received this allowance. This was unjust since counselors and pharmacists also did not work less than doctors with high-risk patients.

"I think everyone working in the methadone program should receive that allowance, in terms of money or other substitutes." (Female, 39 years old, pharmacist, 3 years of MMT experience)

8) Lack of policies to protect providers

CHWs at CHCs felt insecure about their job in MMT program because the existing law only protected providers at MMT clinics, not CHWs who provided MMT as their part-time job, in terms of clinical practice. Such laws did not take into account the fact that CHWs at CHCs had to assume multiple responsibilities and could not always be responsible for their patients.

While doctors were the only staffs who could be legally responsible for prescribing methadone dose to patients and related clinical issues, and given the scarcity of doctors, assistant

doctors or other staff could take care of doctors' duties, especially when the doctors were not available at CHCs. However, there was no policy to protect the doctors or to share their responsibility with other staffs. If something happened while they were not there, they would still be held accountable.

"Legal documents require that physicians must sign on all prescriptions. They should have some articles on how to do when the physicians are not there and if there were only assistant doctors. These regulations would protect physicians." (Male, 36 years old, clinic head and doctor, 1.5 years of MMT experience)

Suggestions from providers

1) Suggestions for a better implementation of MMT at CHCs

The majority of participants supported MMT and MMT decentralization program as they saw positive outcomes of the patients, their families and the community. To better implement MMT at CHCs, CHWs suggested choosing CHCs and deciding the number of dispensing sites carefully based on the number of registered PWUD in the local area, the spread of local residents (travelling distance from villages to CHCs) and their culture and/or customs. If there were only few MMT patients, the investment (e.g. structural facilities) would be wasted. On the other hand, if one CHCs had a large number of MMT patients, it would raise concerns about the safety and workload of providers. There is suggestion to have a safeguard staff for safety control at the CHCs, especially when local polices are not nearby. In addition, although most CHCs accepted patients from nearby communes as not all CHCs had MMT, there were some concerns about giving treatment for patients outside their commune given the higher possibility of rule violations and lower retention rates.

Participants appreciated the collaboration between different sectors and the local government to support the MMT program at CHCs. Some CHWs mentioned that they could recruit or maintain patients in treatment better if there were official agreements among local government (i.e. People's committee), different sectors of medicine, social affairs and police.

"We need the inter-agency cooperation. With the involvement of the local government, the police and border army, we would be able to recruit many patients. They just need to tell patients that if the latter don't enter into methadone, they would be sent to compulsory rehab." (Male, 36 years old, clinic head and doctor, 1.5 years of MMT experience)

2) Financial policies to support patients

Several CHWs expressed their concerns for patients' ability to afford MMT. Although the medication (i.e. methadone) was freely provided by the government and patients had to pay only for operating costs, there was no priority policy for poor or minor ethnicity patients and the treatment fee cannot be covered by health insurance. Most patients of our participants were poor and had no permanent income. Before entering the treatment, patients often had to go to the main clinic at district level to do several screening tests to ensure they could safely be on MMT. The monthly treatment fees (about $10 to $15) could also be a big burden to many families and could lead to dropout. In addition, it was common that patients might skip their methadone doses for a few days every month when they did not have enough money to pay for their treatment on time.

"I think we need policies that provide support for those who aren't financially capable. […] Health insurance, for example. Some people want to get in treatment, but they cannot pay 600,000 dongs ($30) for the test at intake. They have no money. It's not a small sum." (Male, 26 years old, counselor, 5 years of MMT experience)

3) More treatment options for patients

Commuting difficulties and the availability of drugs in mountainous areas might hinder the implementation of MMT programs. To deal with the situation, CHWs suggested that longer half-life medications (i.e. buprenorphine) should be available at their CHCs, especially when 3 CHCs in the province were piloting this medication.

"Our patients live far from here. In rainy seasons or in winter, it's extremely challenging for them to commute. I heard that this medication could be effective for longer, thus it could help patients. I want to learn more about it to provide for my patients." (Female, 34 years old, clinic head, 3 year of MMT experience)

"Faraway villages like ours were challenging because of travel difficulties, low education level and a lot of drugs. That's why many people come to us to receive methadone treatment but also many of them relapse. It's easy to buy drugs here. We're just a few kilometers away from Lao." (Male, 28 years old, pharmacist, 4 years of MMT experience)

Discussion

At the individual level, the lack of confidence and motivation in providing services prevented CHWs to work effectively in MMT program. These findings are consistent with previous studies that also emphasized the role of competence and financial remuneration for CHWs to do their MMT work (Livingston et al., 2018; Pelet et al., 2005; Schulte et al., 2013; Van Hout et al., 2018). Providing more SUD-related training and systematic technical support is important to build CHWs' confidence in providing MMT. On the other hand, being acknowledged and receiving adequate compensation would be helpful to motivate CHWs in their MMT work. These potential solutions are closely related to other challenges at higher levels

including institutional supports and national policies/regulations. In addition, it should be noted that most CHWs in our study do not have much stigmatization and reluctance in working with PWUD or providing MMT, unlike previous findings in other countries (Abouyanni et al., 2000; Turner et al., 2005; Van Hout et al., 2018). One potential explanation is that CHWs in Vietnam in general not only provide treatment but also do outreach work. As they are likely to live in the same area (i.e. same commune), they would know many patients as well as their family in person. In addition, CHWs live in the same culture and traditions/customs with PWUD, thus they have more sympathy for their patients. For example, in mountainous area, many minority groups have a tradition of using opium to relief pain and seek comfort. Therefore, the arrival of heroin, a more potent opioid, has quickly become a common habit in these areas. Many CHWs in our study reported that they had witness many of their friends and relatives gradually became addicted to heroin.

At the clinic level, we found that leadership was an essential part of a successful decentralization program. At the time of this study, there was no clear rule or regulation on the implementation of MMT at CHCs, except a decree on implementing MMT dispensing sites in general. Thus, provincial and district leaders had all authority over the actual implementation of MMT program at their province and districts. While districts should have a comparably similar public budget as they are under the same province, their budget for MMT program was different from each other and seemed to depend on the willingness and support of the leaders. We found differently facility investment and support mechanism for MMT program among different districts and CHCs. These factors may have great impact on CHWs' motivation to work in MMT. Each district and CHC, theoretically, could have enough budget to run the MMT program by themselves with the treatment fee if they have a reasonable number of patients. Since the

methadone and basic salary of staff are provided by the government, they could use the treatment fee from patients for more incentive mechanism for providers and/or maintain a full-time staff to support the daily activities. This encouragement strategy would be good in motivating CHWs in doing their job and making effort to improve their treatment quality to attract more patients (Lin et al., 2010).

At the environmental level, legal infrastructure plays a crucial role in implementing any medical treatment, especially in MMT programs where CHWs have to provide a strictly regulated medication to a marginalized population (Van Hout & Bingham, 2014). CHWs perceived the lack of policies to support MMT programs at CHCs and to protect MMT providers as the main barriers for their work. Policies should be available to provide reasonable compensation for staff's additional workload and working time. When such policies are available, district leaders would have a legal basis to ensure a fair incentive mechanism across different CHCs. In addition, there should be a law of shared responsibilities to protect providers, especially for physician. With limited human and facility resources at CHCs, a protective law would make providers feel safer and more confident in providing MMT services. As discussed above, although challenges were presented at different levels, they interacted with each other; factors at higher levels would impact factors at lower levels.

Several recommendations from CHWs to improve decentralization treatment program were documented. Providing MMT at CHCs was expected to support patient's access to and retain in care. However, in mountainous areas like the study locations, daily travels to CHCs to receive the medication would be challenging for many patients. Therefore, CHWs suggested having more treatment options that did not require daily dosing (like buprenorphine) to make treatment easier for patient (Van Hout et al., 2018). Another common recommendation was

financial support policies for MMT patients. If addiction is considered as a medical disease, it should be covered by health insurance or treatment fees should be reduced. This would enable more patients to enter and retain in treatment. In addition, a multidisciplinary approach and collaboration across agencies was documented in the literature as an effective strategy implement OUD treatment in primary care (Lagisetty et al., 2017; Schulte et al., 2013). However, it should be noted in our study that some CHWs valued an approach in which PWUD were forced to choose between MMT and compulsory rehab centers. While this approach might be helpful in recruiting more patients into treatment, it would not guarantee treatment outcomes for patient might lack the motivation for treatment (Livingston et al., 2018; Shapiro et al., 2013).

The study results should be examined within its limitations. The data was collected from a mountainous region with multiple minor ethnicities. The lower education level of local resident and the availability of illicit drugs might cause different challenges to local CHWs in providing MMT at CHCs from other provinces in Vietnam. However, the findings from this study are comparable to other mountainous areas with similar characteristics and could be useful to improve the effectiveness of the decentralization program in general.

Conclusion

The study highlighted major challenges faced by CHWs in MMT decentralization program in Vietnam. Continuing training and systematic technical support are important to build providers' confidence in providing MMT services. Policy makers and local authorities should recognize and respond to the needs of services providers to ensure the treatment quality and the effectiveness of the program. The government should ensure the infrastructure and legal basis to support the MMT program at CHCs and to provide services providers with adequate

compensation. Future interventions to improve the MMT decentralization models should take into account the multileveled challenges of CHWs to be effective.

Table 4.1. Demographic characteristics of in-depth interview participants (N=26)

Characteristics	Number	%
Gender		
Male	12	46.2
Female	14	53.8
Age		
≤ 29 years	10	38.5
30 – 39 years	13	50.0
≥ 40 years	3	11.5
Ethnicity		
Kinh	18	69.2
Thai	7	26.9
Other	1	3.8
Position in MMT program		
Manager	8	30.8
Doctor	5	19.2
Counselor	6	23.1
Pharmacist	3	11.5
Medication dispensing staff	7	26.9
Highest medical education		
Graduate (≥ 4 years)	5	19.2
College (3 years)	5	19.2
Lower (≤ 2 years)	16	61.5
Length of MMT experience		
≤ 12 months	4	15.4
13 – 36 months	13	50.0
> 36 months	9	34.6

MMT, methadone maintenance treatment

Table 4.2. Perceived challenges of providing MMT in primary care

Individual-level factors	Clinic-level factors	Environment-level factors
• Lack of confidence • Lack of motivation	• Inadequate human resource • Lack of institutional support • Insufficient technical support • Lack of referral resources	• Lack policies to support the MMT program at CHC • Lack of policies to protect service providers

MMT, methadone maintenance treatment; CHC, community health centers

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Chapter 5: Summary

Our study is among the first works that examine the perceived challenges of CHWs in providing MMT in primary care settings in Asia. The mixed method design provided information about CHWs' competence in providing MMT and their multi-level challenges in doing their job as part-time MMT providers at CHCs. The findings of this study shed the first light on the MMT decentralization in Vietnam and in other low-and middle-income countries. The study provides evidence for future efforts to improve the decentralization of MMT and medication-assisted treatment (MAT) in general for opioid use disorders (OUD).

Recommendation

Suggestions for future MMT and MAT for OUD decentralization models:

1) Training and intervention to reduce provider stigma should be enforced to improve provider-patient clinical interaction with PWUD.
2) Continuing training and technical support are important to build PCPs' confidence in providing MMT services.
3) More treatment options should be available to meet the diverse needs of patients with OUD.

Policy implications for Vietnam:

1) More attention should be given to institutional support and the infrastructure system to ensure the quality of MMT care at primary settings.
2) Interagency and intersection collaboration should be further encouraged to ensure the quality of MMT care. MMT patients need not only medical but also psychological and

social support. In addition, a supportive legal framework would ensure a therapeutic environment for an effective addiction treatment system.

3) Specific regulations on providing MAT for OUD including methadone at primary care should be developed to guide the program implementation and ensure adequate compensation for CHWs.
4) MMT treatment fee should be covered by health insurance to enable poor patients to enter and maintain in treatment.

Limitation

The study results should be interpreted in light of some limitations. Firstly, the cross-sectional design of the quantitative studies would hinder our ability to make causal inferences for the identified associations. Our results, however, provide some suggestions for future studies and MMT quality improvement interventions. Secondly, given the study was conducted in three provinces in Northern Vietnam, its findings could not be representative of the whole country. However, since our study covered both urban (sub-study 1) and mountainous (sub-studies 2 and 3) areas, it may provide some ideas about the overall situation of MMT decentralization provision in Vietnam.