

**HIV/STI Prevention, Unmet Health Needs, and Work Stress among
Im/Migrant Sex Workers in Metro Vancouver**

by

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ABSTRACT

Background: Im/migrant women often face barriers to conventional labour markets in destination countries, and are disproportionately represented in precarious employment arrangements, including sex work. Apart from sexual health, research examining broader health concerns of im/migrant sex workers (SWs) remains scarce. This thesis sought to investigate the relationship between im/migration experiences and (1) inconsistent condom use with clients, (2) unmet health needs, and (3) dimensions of work stress among SWs.

Methods: This thesis utilized data from “An Evaluation of Sex Workers Health Access” (AESHA), a community-based prospective cohort of SWs in Metro Vancouver. Bivariate and multivariable logistic regression using generalized estimating equations (GEE) were used to model correlates of inconsistent condom use among im/migrant SWs only (Objective 1) and unmet health needs among all SWs (Objective 2). Multivariable confounder models using linear regression with GEE were developed to examine independent relationships between im/migration experience and dimensions of work stress (Objective 3).

Results: In Objective 1, multivariable GEE analysis conducted among 182 im/migrant SWs enrolled in AESHA from January 2010 and February 2013 revealed that difficulty accessing condoms was the strongest predictor of inconsistent condom use (Objective 1). In Objective 2, among 742 im/migrant and Canadian-born SWs enrolled from January 2010 to February 2014, multivariable GEE analysis found that recent and long-term im/migration, police harassment and arrest, and lifetime abuse/trauma were associated with greater unmet health needs. In Objective 3, among 545 SWs enrolled from January 2010 to September 2014, multivariable confounder GEE modeling revealed that recent and long-term im/migrant SWs faced decreased work stress related to job demands compared to their Canadian-born counterparts, after adjustment for key confounders.

Conclusions: Findings suggest that im/migration experience is a key driver of HIV/STI prevention, healthcare access, and work stress among SWs. Importantly, im/migration experiences intersect with other structural factors – working conditions, violence, policing, sex work criminalization– to shape the health and safety of im/migrant SWs. Culturally appropriate, low-barrier health and support services should be made accessible to im/migrant SWs. Sex work decriminalization along with supporting

collectivization efforts within the workplace are also recommended to improve working conditions, health, and human rights for im/migrant SWs.

PREFACE

This thesis was conducted using data from the ongoing prospective study of sex workers in Metro Vancouver: An Evaluation of Sex Workers Health Access (AESHA), led by Drs. Kate Shannon and Shira M. Goldenberg and funded by the US National Institutes of Health (R01DA028648), Canadian Institutes of Health Research (HHP-98835), the Canadian Institutes of Health Research/Public Health Agency of Canada (HEB-330155), and MacAIDS. All data collection, entry, coding, and cleaning was completed by AESHA staff at the BC Centre for Excellence in HIV/AIDS (BC-CfE). This study has been approved by Providence Health Care/University of British Columbia Research Ethics Board (AESHA: H09-02803)

I conceptualized the research designs (Chapters 2 to 4) with guidance and feedback by my supervisory committee (Dr. Jean Shoveller, Dr. Shira M. Goldenberg, and Dr. Kate Shannon). I collaborated closely with statisticians from the BC-CfE to develop data analysis plans that were carried out by them using SAS. I created all tables using Microsoft Word.

A version of Chapter 2 of this thesis has been published in *Sexually Transmitted Diseases*: Julie Sou, Kate Shannon, Jane Li, Paul Nguyen, Steffanie A. Strathdee, Jean Shoveller, Shira M. Goldenberg. "Structural determinants of inconsistent condom use with clients among migrant sex workers: Findings of longitudinal research in an urban

Canadian setting.” Findings from Chapter 2 have also been presented in poster form at the 24th Annual Canadian Conference on HIV/AIDS Research on April 30, 2015, Toronto, Canada.

Versions of Chapters 3 and 4 have been submitted for publication and are currently under review at peer-reviewed journals.

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LIST OF ABBREVIATIONS

ACSA: Agincourt Community Services Association

ACSWF: Access to City Services Without Fear

AOR: Adjusted Odds Ratio

AESHA: An Evaluation of Sex Workers' Health Access

BC: British Columbia

BC-CfE: BC Centre for Excellence in HIV/AIDS

CAB: Community Advisory Board

CCHS: Canadian Community Health Survey

CI: Confidence interval

CIHR: Canadian Institutes of Health Research

GEE: Generalized Estimating Equations

GSHI: Gender and Sexual Health Initiative

HCV: Hepatitis C Virus

HIV: Human Immunodeficiency Virus

HSV-2: Herpes Simplex Virus-2

IPV: Intimate Partner Violence

IQR: Interquartile Range

JCQ: Job Content Questionnaire

OR: Odds Ratio

PRA: Prostitution Reform Act

QIC: Quasi-likelihood under the independence model criterion

STI: Sexually Transmitted Infection

SWAN: Supporting Women's Alternative Network

SW: Sex Worker

UN: United Nations

UNAIDS: Joint United Nations Programme on HIV/AIDS

UK: United Kingdom

US: United States

WHO: World Health Organization

WISH: Women's Information Safe Haven

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DEDICATION

To my mom, Cynthia, who inspired and challenged me to pursue this in the first place.

1. INTRODUCTION

1.1. BACKGROUND

Globally, it is estimated that there are over 240 million international migrants worldwide (1), of whom about 49% are women (2,3). Major drivers of migration for women include seeking new economic and social opportunities, family reunification, and improved health and security (2,4,5). However, previous research has shown that migrant women frequently face barriers to employment opportunities in destination countries, often as a result of language barriers, discrimination, social isolation, and limited recognition of foreign education and credentials in destination countries (6). Resulting from structural barriers to conventional and formal labour markets, female migrants are disproportionately represented within informal sectors of work and precarious employment, including sex work (2,7,8). In this thesis, the term im/migrant sex workers – a term preferred by im/migrant sex worker organizations in the Vancouver area – refers to women who have left their home country to establish themselves in another country, currently work in the sex industry, and who migrate for various reasons under an array of legal immigration statuses (9). This definition is inclusive of individuals who possess more permanent and formal legal immigration status (e.g., citizens,

permanent residents) as well as undocumented migrants, visitors, and those who have temporary status (9).

While sex work has not been extensively studied in the context of migration or precarious employment, previous research has raised concerns regarding the unsafe and precarious working conditions faced within the sex industry in comparison with other informal and formal sector work (8). In settings where sex work is criminalized such as Canada, sex work can be considered a precarious employment arrangement – that is, work that is non-standard, insecure, and lacks worker protection (i.e., does not guarantee or regulate workers' rights) (7,8,10). International research has determined a link between precarious work and gender, where women may be significantly more likely to work in worse conditions and are more exposed to sexual harassment as compared to men (7,10). Importantly, there is also often low access to occupational health and safety in informal work (11,12), which has been shown to be especially true for sex workers in contexts where sex work is criminalized and heavily stigmatized. Further evidence indicates that im/migrant workers may face additional concerns related to language barriers, racism and discrimination, and legal status (13–15) – im/migrant sex workers are doubly exposed to the insecurities related to precarious work and migration.

To date, research on the health and well-being of im/migrant sex workers has primarily focused on Human Immunodeficiency Virus (HIV) and sexual risk behaviours,

which has yielded relatively heterogeneous findings (2,16). For example, a global systematic review concluded that im/migrant sex workers originating from lower-income countries were at elevated risk for HIV as compared to non-migrants, while im/migrants originating from higher-income countries were at lower risk (2). Studies conducted in Italy and Australia have found that im/migrant sex workers faced higher rates of sexually transmitted infections (STIs) such as chlamydia, gonorrhea, syphilis and genital herpes, than local-born sex workers (17,18), whereas research from South America have found that im/migrant sex workers face lower risks of STIs and violence compared to non-migrant sex workers (19). Previous research with im/migrant sex workers across diverse international settings also suggests that workers experiencing client violence, higher client volume, client condom refusal, forced sex, alcohol use, and negative police relations typically face elevated HIV/STI risks (12,14,18–21).

In Vancouver, Canada, while numbers are not absolute due to the underground nature of sex work, a study published in 2013 showed that visible minority women represented ~25% of all sex workers in Metro Vancouver (primarily of Chinese nationality), Indigenous women 39%, and Caucasian/white women 36% (26). To date, research has largely focused on Indigenous and Caucasian women in sex work, with research centered around drug use, homelessness, HIV/STI prevalence, and violence and abuse (26–29). While it is acknowledged that Indigenous women are over-represented in

street-based sex work and have high HIV incidence (29), this thesis argues that im/migrant women in sex work also face a number of health inequities and a different set of risks and protective factors for health, as compared to Canadian-born sex workers, that need to be further elucidated. For example, prior research conducted in Vancouver has shown that im/migrant sex workers in this setting face lower HIV and STI prevalence compared to locally-born sex workers (0.61% versus 15.20% for HIV seropositivity, and 4.91% versus 13.14% for acute STI infection), are more likely to work in managed in-call spaces (e.g., massage parlours, health enhancement centres), are less likely to use injection and non-injection drugs, earn a higher income from sex work, and are more likely to support dependents as compared to Canadian-born counterparts (3).

Epidemiological and qualitative research conducted in Vancouver also shows that im/migrant sex workers continue to face persistent challenges and health inequities related to high rates of workplace violence, ethnic discrimination, police raids and harassment, and barriers to testing and treatment for HIV, STIs, and other blood-borne infections (e.g., Hepatitis C virus (HCV)) (3,6,30–32). Apart from this limited and inconclusive body of research surrounding HIV prevention and sexual health among im/migrant sex workers, there remains a gap in research evidence related to the broader health and well-being of im/migrant sex workers, including determinants of condom

access and use, health access and unmet needs, and other occupational health issues such as work stress.

1.2. STRUCTURAL DETERMINANTS OF IM/MIGRANT SEX WORKERS' HEALTH

Current global evidence highlights how the precarious and unsafe working conditions sex workers are frequently exposed to result from intersecting structural forces, namely sex work-related stigma and criminalization (33,34). Research conducted primarily with street-based sex workers highlights how criminalization and other structural forces result in highly unsafe working conditions for sex workers, reducing their capacity to access healthcare services and HIV prevention, and limiting opportunities to negotiate condom use within the context of punitive law enforcement practices, fear, and stigma faced in criminalized contexts (33,35–37). However, less is known about how such structural determinants influence the health of im/migrant sex workers within managed in-call and formal indoor work environments (e.g., massage parlours).

Given the recognized importance of structural determinants – that is, “factors that are external to the individual and operate outside the locus of control of individuals” (38) – in shaping HIV risks among sex workers, this thesis adapts a *structural determinants of HIV in sex work* framework (38) to the context of im/migrant sex workers’ broader health

and healthcare access. In doing so, this thesis goes beyond the primary focus of prior literature on individual, biological, and behavioural mechanisms of HIV transmission and places a central emphasis on structural factors that shape sex workers' broader health and safety (16,38).

Briefly, this framework includes (i) *macrostructural factors*, including social, economic, and health policies; laws governing sex work; mobility and migration; geography; sociopolitical transitions; stigma; and cultural norms; (ii) *community organization determinants* including community empowerment and sex work collectivization (i.e., a community-based group of sex workers who support and lobby for rights, health, and well-being for those in the sex industry) (39); and (iii) *work environment factors* consisting of intersecting physical, social, economic, and policy features of work venues that include venue characteristics; managerial practices; the enforcement of criminal laws surrounding sex work (e.g., police arrest and harassment); condom coverage and access; and HIV/STI testing and treatment. These factors work iteratively and in conjunction with *individual and partner-level factors* (e.g., client- and/or intimate partner relations) in shaping risks and protective mechanisms for sex workers' health (16).

A number of structural determinants have been hypothesized to differentially influence the health of im/migrant sex workers as opposed to their locally-born

counterparts. For example, a study among sex workers in Vancouver indicated that im/migrants were more likely to service clients in formal indoor work venues, and were less likely to be exposed to violence than Canadian-born sex workers (3). The health status of im/migrant sex workers may also be shaped by differing policies related to health access and sex work in home and destination countries, cultural perceptions of health and wellness, experiences of racialization and discrimination, language barriers, and differences in socioeconomic status (e.g., housing, income) over the course of im/migration (2,3). Importantly, while many of these structural determinants of health may vary by the stage of im/migration and the transitions associated with different phases of migration (5), most research has only examined these determinants in relation to im/migrant status (e.g., foreign versus locally-born).

This thesis addresses three intersecting structural determinants that may be especially pertinent in shaping the health and well-being of im/migrant sex workers – (i) the enforcement of criminalized sex work laws, (ii) features of work environments, and (iii) im/migration experiences (40), which are discussed in greater detail below.

1.2.1. Criminalization Within the Sex Industry

Global research has established that the enforcement of laws and policies that criminalize sex work have been linked to an array of negative health and social outcomes

among sex workers, including increased HIV/STI risk, increased violence, and unsafe working conditions (16,41–43). However, criminalization of sex work remains the prevailing legal approach worldwide (41). In Canada, sex work is currently governed by the “Protection of Communities and Exploited Persons Act” (Bill C-36), implemented in December 2014 (44,45). This act predominantly seeks to criminalize clients who purchase sexual services, third parties who advertise for and receive financial or material benefit from sexual services, and indirectly criminalizes sex workers who communicate for the purposes of selling sex in public places (i.e., communicating where a minor may be present) (44,46).

The data employed in the analyses described in the current thesis were gathered prior to these legal changes and provide preliminary insights on the effects of such policies on sex workers’ health and safety, particularly as they relate to im/migration experience (47). Other research on the new law suggests that criminalizing buyers of sex may reproduce many of the harms associated with Canada’s previous laws criminalizing other aspects of sex work more directly, including rushed client negotiations (which reduces the likelihood of successfully negotiating condom use or effective screening for safety), displacement of workers to isolated work areas, and discouraging workers from reporting violence or robbery due to fear of punitive police responses (41). Whereas much previous work elucidating the harms of criminalization has been conducted with

primarily Canadian-born and substance using sex workers within street-based contexts, the health, safety, and working conditions of indoor and im/migrant sex workers, however, remain much less well understood in relation to sex work criminalization, both in Canada and elsewhere.

1.2.2. Work Environment

Within the context of sex work, features of managed indoor work environments (e.g., massage parlours, health/beauty enhancement centres, micro-brothels) have been shown to afford protections in terms of HIV/STI prevention, enhanced public health and violence prevention interventions, and increased access to safety measures (43,48). A recent qualitative meta-analysis suggested that enhanced occupational health and safety standards of indoor work spaces, supportive policies and practices of third parties such as managers and owners, and peer support from other sex workers were important attributes of indoor sex work environments that can promote HIV/STI prevention and sexual health (43). Third party actors (e.g., venue managers, receptionists) can play a pivotal role in maintaining the safety of sex workers through implementing codes of client conduct, screening clients, removing violent clients, and alerting sex workers of possible police raids (32). However, negative and adversarial relationships with police and other authorities (e.g., immigration, municipal by-law inspectors), which largely

stem from the criminalization of various aspects of sex work (e.g., third parties), restrictive by-law policies, stigma, and racial profiling of Chinese-run establishments, have been shown to undermine sex workers' ability to access safer indoor workspaces and have been linked to negative work conditions (16,32,41,43).

For example, research conducted in Vancouver have shown that access to HIV/STI prevention and the precariousness of indoor sex work for im/migrant sex workers may largely stem from the negative impacts of raids and inspections by police, municipal by-law inspectors, and Canadian border services agency; the confiscation or use of condoms as evidence of criminalized activities; and arrests, deportations, venue closures, or enhanced fear following such enforcement-based activities (16,41,48). Sex work criminalization also shapes local policies and practices surrounding the sex industry (e.g., municipal by-laws governing massage parlours and health enhancement centers), which often constrain the ability of sex workers and third party actors to create safer working conditions. In the case of Vancouver, by-laws that place restrictions on door locks and window coverings and enforce bright lighting have been shown to increase fear of robbery and client-perpetrated violence, and to exacerbate stigma and stress stemming from a lack of privacy and the possibility of having one's sex work activity publicly exposed (32). This thesis builds upon these qualitative findings by quantitatively examining the relationships between various health outcomes (e.g., condom use, unmet

health needs, work-related stress) and structural determinants that are a product of sex work criminalization and indoor working conditions (e.g., police harassment, hours worked, income, workplace violence, social cohesion).

1.2.3. Im/migration Experience

Structural determinants (e.g., gender, socioeconomic, political) often act as push-pull factors that influence the decision to migrate to a new country and may simultaneously pre-dispose im/migrant populations to risks and protections for certain health outcomes (5,49,50). While some previous reports and media attention have assumed im/migrant sex workers to be trafficked to destination countries, thereby conflating migration for sex work with trafficking (51–54), peer-reviewed research has shown that im/migrants largely enter the sex work industry free from deception, exploitation, or coercion (3,9,53). For example, research from Vancouver found that only 1.8% of im/migrant sex workers reported a lifetime history of trafficking, and were significantly less likely to report this experience than their Canadian-born counterparts (3), contrary to popular opinion.

Although im/migrant-specific sex work research has been generally limited, in part due to historical tendency to conflate im/migrant sex work with trafficking, prior studies on the link between im/migration experiences and HIV/STI risks among sex

workers have yielded mixed findings, with research suggesting that im/migrant sex workers face enhanced risks as well as protective factors against HIV/STIs across different settings (2,16,25). In addition to these heterogeneous findings, limited evidence exists regarding the health access and occupational health of im/migrant sex workers, including unmet need for healthcare and work-related stress. Furthermore, much of the research regarding the health of im/migrant sex workers has examined migration as a dichotomous variable (yes versus no), with limited attention to variations according to the duration or phases of migration.

Im/migration research involving the general population has shown im/migration duration – that is, patterns of short (≤ 5 years) versus long-term (> 5 years) settlement in destination settings (55,56) – as well as the different phases of migration (e.g., pre-departure, travel, destination, interception, return) (5,49), to be key predictors of health outcomes among some immigrant populations. For example, in the U.S., newly arrived im/migrants are often healthier than their native-born counterparts or long-term migrants (57) (i.e., the “healthy immigrant effect”). This has been postulated to be due to differences in norms and practices related to health behaviours (e.g., taboos on extramarital sex or substance use in home communities) as well as to a selection effect, with healthier individuals hypothesized to be more likely to migrate in the first place (49). However, this im/migrant health advantage has been observed to eventually decline,

with im/migrants becoming more similar to the native-born population over the course of arrival and settlement (57–59). In Canada, several studies using Canadian Community Health Survey (CCHS) data have observed a ‘healthy immigrant effect’ for certain health issues, with im/migrants reporting fewer chronic conditions and lower rates of depression and alcohol dependence than Canadians during early years of migration (55). However, this trend is not apparent across all health issues (e.g., higher rates of tuberculosis among im/migrants) (55,59). Importantly, while much literature has attributed the ‘healthy immigrant effect’ to individual-level behavioural factors, this may also speak to different structural determinants of health experienced by im/migrants within home and destination countries (e.g., socioeconomic status, cultural differences and discrimination, housing) (5,49).

Alternatively, other research has attributed exacerbated health inequities among migrants – for example, patterns of poorer reproductive health and barriers to healthcare access – to the disruptive effects of migration (60–62). This body of work posits that the dislocation and marginalization frequently experienced by recent arrivals, such as enhanced social isolation, unfamiliarity with health systems, and a lack of health insurance, are most pronounced immediately following arrival to the destination country, resulting in poorer health initially, which may diminish over time (62,63). To examine the relationship between the duration of im/migration experience on specific

health outcomes, Chapters 3 and 4 of this thesis utilized an “im/migration duration” variable that accounts for recent (≤ 5 years), long-term (> 5 years), and no migration experience.

1.3. RATIONALE

Based on previously published research and the lack of evidence on the broader occupational health and healthcare access of im/migrant sex workers, particularly in North America, each chapter of this thesis addresses a distinct health issue within the context of im/migrant sex work in Vancouver, Canada. Given the significant heterogeneity in evidence pertaining to HIV/STI prevention of im/migrant sex workers and the significant barriers to health and safety for im/migrant sex workers that have been previously suggested (21,32,64), Chapter 2 investigates patterns and determinants of condom use and access for im/migrant sex workers. Secondly, while previous research has highlighted the serious barriers to healthcare access frequently faced by sex workers, the reasons for such barriers have not been adequately explored, and little is known about healthcare access and unmet health needs within the context of im/migrant sex work. To address this, Chapter 3 investigates patterns of unmet health needs, defined as “how often can you get health care services when you need it”, among sex workers and assessed its relationship to im/migration experience among sex workers. Lastly, few sex

work-specific studies have investigated the occupational health and safety of sex workers, with only a handful of social science studies conducted on this topic within decriminalized or legalized contexts (13,65–67). This research suggests that daily occupational health and safety concerns related to sex work – including violence, musculoskeletal problems, bladder infections, and work-related stress – may be of more immediate concern to sex workers than the risk of HIV (13). Moreover, despite qualitative evidence suggesting that im/migrant sex workers experience high levels of stigma and stress within criminalized contexts, little is known about experiences of work stress in relation to im/migration experience among sex workers. Chapter 4 seeks to address this gap in knowledge by investigating the effects of different facets of work stress among sex workers, and their relationship to im/migration experience (e.g., recent, long-term, no migration).

Taking into account these gaps in research evidence on sex workers' occupational health and healthcare access within the context of im/migration experience, this thesis aimed to strengthen the evidence base to inform programs and policies to promote the health and safety of im/migrant sex workers. Specifically, findings of this thesis are relevant to strengthening HIV/STI prevention programs, tailoring healthcare services to the needs of im/migrant sex workers, and promoting the occupational health and safety of sex workers under a labour rights framework.

1.4. OBJECTIVES

The objectives of this thesis are as follows:

1. **To examine structural determinants of inconsistent condom use with clients among im/migrant sex workers.** It is hypothesized that working in formal indoor work environments will be associated with decreased odds of inconsistent condom use with clients, given previous research that suggests indoor work environments are protective of sexual health.
2. **To analyze the relationship between im/migration experience and other socio-structural factors and unmet health needs among sex workers.** It is hypothesized that unmet health needs will vary by im/migration duration with recent im/migrants experiencing greatest unmet needs as a result of the disruptive effects of migration and unfamiliarity with the healthcare systems.
3. **To analyze the effect of im/migration experience on facets of work stress (i.e., decision authority, job demands) among sex workers.** Given the paucity of research on occupational health and safety among sex workers and lack of research concerning effects of im/migration, this chapter applies a labour framework (work stress index from the CCHS) to the sex work population to allow us to compare sex workers with other work sectors. Since im/migration duration has been shown to be a key predictor of health outcomes in broader im/migrant-specific studies, it

is predicted that work stress will be highest among recent im/migrant sex workers given language barriers and lack of social supports upon settlement.

1.5. STUDY SETTING AND SAMPLE

This study was conducted in Metropolitan Vancouver, British Columbia (BC), a region comprised of 21 municipalities, of which Vancouver is its most populous city (68). In the last two decades, immigration has accelerated in this region with recent immigration contributing to almost 90% of population growth (69). According to Statistics Canada, immigrants to Metro Vancouver primarily originate from China, India, and the Philippines, with 80% of recent immigrants settling in the cities of Vancouver, Surrey, Burnaby, Richmond, and Coquitlam (69). Over 60% of permanent residents arriving in BC are economic immigrants, with slightly more women arriving under family sponsorship than men (70). While more than 60% of female immigrants arriving in Canada intend to work in the professional sector, language differences and non-recognition of foreign education are some of the major barriers to securing formal-sector employment (6,70). In a joint report published by sex work support organizations in Vancouver and Toronto, Chinese sex workers in Canada mainly originated from Hong Kong, with the majority having worked in small businesses and other formal employment such as teaching prior to moving to Canada (71).

Data for each objective was drawn from “An Evaluation of Sex Workers Health Access” (AESHA), an ongoing community-based cohort of sex workers in Metro Vancouver. This study was developed based on extensive community collaborations and ongoing partnerships with sex work agencies since 2005 (72) and continues to be monitored by a Community Advisory Board (CAB) consisting of over 15 community agencies. Interview, outreach and nursing staff include experiential (current/ former sex workers) staff and staff with extensive community experience. Eligible participants were women (cisgender and transgender), exchanged sex for money within the last 30 days at baseline, and able to provide informed consent. Time-location sampling was used to recruit participants through day and late-night outreach to outdoor/ public sex work locations (i.e. streets, alleys, industrial settings) and off-street sex work venues (e.g., in-call/formal sex work establishments such as massage parlours; informal venue-based sex work such as bars, hotels; and sex workers who independently self-advertise through online or newspapers) across Metro Vancouver (72). Indoor sex work venues and outdoor solicitation spaces (“strolls”) were identified through community mapping conducted together with current/former sex workers (72), and continue to be updated by the outreach team. The study received ethical approval through Providence Health Care/University of British Columbia Research Ethics Board.

At enrolment and on a bi-annual basis, participants complete an interview-administered questionnaire by a trained interviewer and HIV/STI/HCV serology testing by a project nurse. The main interview questionnaire elicits responses related to socio-demographics (e.g., age, sexual identity, ethnicity, housing, im/migration experience); sex work patterns (e.g., number of clients, fees/ types of sexual services, client characteristics, and condom use); structural environment factors (e.g., criminalization, city licensing/ inspection, adverse interactions with police, prostitution arrests); work environment factors (e.g., type of venue, management structure, access to equipment, and social cohesion); sexual history; trauma and violence; and drug use patterns.

Sex workers have the option of visiting either of two storefront office locations in Metro Vancouver or complete the questionnaire and nursing component at their work or home location. All participants receive an honorarium of \$40 CAD at each bi-annual visit for their time, expertise and travel. Treatment is provided by our project nurse onsite for symptomatic STI infections, and free serology and Papanicolaou testing are also available as needed, regardless of enrolment in the study.

2. STRUCTURAL DETERMINANTS OF INCONSISTENT CONDOM USE WITH CLIENTS AMONG MIGRANT SEX WORKERS: FINDINGS OF LONGITUDINAL RESEARCH IN AN URBAN CANADIAN SETTING¹

2.1. INTRODUCTION

Global evidence indicates that migrant female sex workers (SWs) experience disproportionate health and social inequities, including those related to HIV and sexually transmitted infections (STIs) (2,73). However, research suggests diversity in the health impacts of migration, which can foster exposure to enhanced risks (e.g., drug use, violence, loss of social support) as well as protective factors such as better wages and working conditions (2,3,20,74). For example, a recent systematic review comparing HIV and STI prevalence among migrant and non-migrant female SWs found that while migrants in low- and high-income countries faced increased STI prevalence in all

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countries compared to non-migrants, only those in lower-income countries were also at elevated risks of HIV (2). Such heterogeneity in HIV/STI protection and risk may be due to varied structural determinants across migration and sex work contexts (16), including differences in cultural and social norms for sexual behavior and drug use, insecure immigration status, social isolation, differential exposure to workplace violence and policing, and barriers to health care and legal assistance (3,53,74–76).

In high-income countries such as Canada and the U.S., research indicates that the majority of long-term international migrants in the sex industry work in indoor establishments, such as massage parlours and ‘health enhancement centres’ (19,77), where they tend to experience lower rates of HIV and violence relative to street-based SWs (19,78,79,21). However, qualitative research has identified a number of persistent barriers to the sexual health and safety of migrant workers in indoor establishments including stigma, competition between workers, limited English proficiency, and police and immigration crackdowns (21,64,80). Moreover, while previous epidemiological research on HIV/STI risks among migrant SWs has emphasized the experiences of migrants in low and middle-income settings (2,3,23,74,81–83), research in North America remains extremely limited (2).

We drew upon a ‘structural determinants of HIV in sex work’ framework to conceptualize condom use among migrant SWs as shaped by intersecting factors

operating at multiple levels – including structural as well as individual (74,75,84). Structural determinants of HIV/STIs among SWs include *macrostructural* laws and policies; *community organization* determinants; as well as *work environment features* (e.g., violence, policing practices, condom access in the workplace). Condom use among SWs is also influenced by *individual and partner-level factors*, including age of sex work initiation, substance use, and numbers/types of sex acts with different partners (16,38).

Although structural determinants are now recognized as critical in shaping SWs' health (16), few studies have evaluated structural determinants of health among migrant workers in the sex industry. Our team's previous work has shown that among SWs, migration is linked to some health-protective factors (e.g., higher condom use; lower drug use), but also enhanced structural risks (e.g., language barriers, barriers to health care access; high levels of police raids and crackdowns; stigma) (3,74,80). Given significant heterogeneity in evidence pertaining to the health and well-being of migrant SWs, and limited research examining structural determinants in particular, the objective of this study was to examine structural determinants of STI/HIV risk measured as inconsistent condom use by clients, among international migrant SWs in Metropolitan Vancouver, British Columbia.

2.2. METHODS

Study Design

Data was drawn from an open prospective cohort, An Evaluation of Sex Workers Health Access (AESHA) that initiated recruitment in late January 2010. The AESHA study was developed based on longstanding community collaborations with sex work agencies since 2005 (72) and is monitored by a Community Advisory Board of representatives from >15 community agencies. As previously described, female (including transgender women) individuals who exchanged sex for money within the last 30 days, were 14+ years of age, and could provide written informed consent were recruited through time-location sampling (27) across Metropolitan Vancouver. SWs were recruited through day and late night outreach to outdoor/public (e.g., streets, alleys) and indoor sex work venues (e.g., massage parlours, micro-brothels, and in-call locations), as well as online recruitment. Indoor sex work venues and outdoor solicitation spaces ('strolls') were identified through community mapping conducted together with current/former SWs (72), and continued to be updated by the outreach team. Following informed consent, participants completed interviewer-administered questionnaires at baseline and semi-annual follow-up visits by a trained female interviewer (both experiential and non-experiential) in English, Mandarin or Cantonese. A shorter interviewer-administered pre-test counseling questionnaire and voluntary HIV/STI serology testing (i.e., syphilis,

gonorrhoea, and chlamydia) was administered by a project nurse to facilitate education, support and referral. All participants received \$40 CAD at each bi-annual visit for their time, expertise and travel expenses. The study is approved by the Providence Health Care/University of British Columbia Research Ethics Board.

Inconsistent Condom Use Outcome

The outcome for the analysis was a time-updated measure of inconsistent condom use by clients for vaginal or anal sex at each semi-annual study visit. Inconsistent condom use was based on reporting less than 100% condom use for sex work transactions in each 6-month period (responses of 'usually', 'sometimes', 'occasionally' or 'never'), for either or both of one-time and regular (repeat) clients. Although conservative, conceptually, women who report less than 100% condom use could be exposed to HIV/STIs; this measure is also consistent with other epidemiological literature (85–87). Participants were asked to report condom use by one-time and repeat clients separately for vaginal, anal and oral sex. Given the low reported rates of anal sex and the relatively lower HIV/STI acquisition/transmission risk through oral sex, inconsistent condom use was only considered for vaginal and/or anal sex at each time interval. Sensitivity analyses were also run separately for regular and one-time clients, with similar directions reported for both analyses.

Independent variables of interest

Based on known and hypothesized factors associated with condom use from the literature and earlier published AESHA data, time fixed variables derived from the main baseline questionnaire included potential confounders such as age, age of sex work entry, education, country of origin, languages spoken, and migration history and duration (<5 years vs. 5+ years in Canada). All other variables were considered as time-updated covariates of occurrences within the past 6 months. These included sexual risks and work patterns (e.g., number of clients), drug use patterns (e.g., injection and non-injection drug use), alcohol use, and average monthly income.

Structural determinants examined included primary places of solicitation and servicing clients, access to condoms, safety support from other workers, exposure to violence, and police harassment. Condom access was assessed by asking whether participants experienced difficulty accessing condoms while working. Primary place of service (sex work transaction) was categorized as working at formal indoor sex work establishments ('in-call' venues such as massage parlours, health enhancement centres and other managed indoor spaces) versus informal indoor venues (e.g., bars, saunas, hotels) and street/public places (16). Safety support from other SWs was derived from a broader set of questions regarding social cohesion in the work place (88) (measured as 'strongly agree', 'agree' or 'somewhat agree' to the statement: "You can count on other workers if

you need help with violence or difficult client”). Client violence included client-perpetrated physical and/or sexual violence in the last 6 months, including being abducted/kidnapped, forced to have unprotected sex, being raped, strangled, or physically assaulted and assaulted with a weapon. Police harassment included experiencing police raids, searches, detainment, physical assault, having property confiscated and being coerced into providing sexual favours.

Statistical Analyses

Of 685 SWs enrolled in the study between January 2010 and February 2013, the prospective analysis was restricted to 182 (27%) migrant SWs, defined as those who had moved to Canada from another country. Descriptive statistics were calculated at baseline, and stratified by whether participants reported any inconsistent condom use in the past 6 months. Differences between migrants who reported inconsistent condom use and those who did not at baseline were assessed using the Mann-Whitney test for continuous variables and Pearson’s Chi-square test (Fisher’s exact test for small cell counts) for categorical variables. Following this, generalized estimating equations (GEE) and an exchangeable correlation structure (89) were utilized to longitudinally examine correlates of inconsistent condom use events over the 3-year study period.

Bivariate and multivariate GEE analyses (90) with a logit link function were used for our binary outcome to account for repeated measures among the same individuals. Socio-demographic characteristics were treated as fixed covariates while all other variables (e.g., drug use, work environment, condom access, and violence) were treated as time-updated covariates. Known potential confounders as described in previous literature, factors hypothesized *a priori* to be related to inconsistent condom use, and variables with a significance level of less than 5% in bivariate analyses were considered for inclusion in the multivariate model. Model selection was constructed using a backward process to obtain the model with the best overall fit, as indicated by the lowest quasi-likelihood under the independence model criterion (QIC) value (91). Analyses were performed using the SAS software version 9.3 (SAS, Cary, NC). All p-values are two-sided.

2.3. RESULTS

Of 401 observations amongst the 182 international migrant SWs included in the analysis, 28 (7%) events of inconsistent condom use by clients were reported over the 3-year study period. Of the 182, 102 participants had returned for at least one follow-up visit, with a median of 2 follow-up visits (interquartile range (IQR) 1-3) and median of 16.6 months (IQR 9.46-21.88) under follow-up.

Most migrants originated from China (76.9%); other countries included the U.S. (3.8%) and Philippines (2.2%). Among migrant SWs, 41.8% had moved to Canada within the past 5 years, whereas the rest were long-term migrants who had spent 5 or more years in Canada. Primary languages spoken included Mandarin (65.4%), English (16.5%) and Cantonese (12.6%). Among international migrants, at baseline 63.2% lived with at least one other person and 54.9% financially supported at least one dependent (i.e., cohabitating partner, boyfriend, children, parents, or other family).

In bivariate GEE analyses over the 3-year study period, younger age at sex work entry (median age: 26.5 vs. 34 years old, Odds Ratio (OR) 0.92, 95% Confidence Interval (CI) 0.87-0.98), high school completion (OR 0.16, 95% CI 0.07-0.40) (Table 2) injection drug use (OR 5.24, 95% CI 1.44-18.98) and use of non-injection drugs (OR 2.98, 95% CI 1.20-7.42) were independently correlated with increased odds of inconsistent condom use.

In terms of structural determinants, servicing clients in formal indoor venues (OR 0.17, 95% CI 0.07-0.41), identifying sex work as one's primary source of income (OR 0.26, 95% CI 0.09-0.76), and experiencing difficulty accessing condoms in the workplace (OR 4.75, 95% CI 1.49-15.15) were all independently correlated with increased odds of inconsistent condom use with clients among migrant SWs.

In multivariate GEE analysis (Table 2) difficulty accessing condoms in the workplace (Adjusted Odds Ratio (AOR) 3.76, 95% CI 1.13-12.47), servicing clients in

formal indoor establishments ('in-call' venues such as massage parlours, health enhancement centres and other managed indoor spaces) (AOR 0.34, 95% CI 0.15-0.77), and high school completion (AOR 0.22, 95% CI 0.09-0.50) remained independently correlated with inconsistent condom use with clients over the 3-year study period.

2.4. DISCUSSION

Despite overall high levels of condom use among primarily Chinese-born migrants in Canada's sex industry, this 3-year study found that barriers to accessing condoms in the workplace can undermine successful sexual risk negotiation between migrant SWs and their clients. We also found that working in formal indoor establishments such as massage parlours, health enhancement centres, and other managed indoor spaces related to more consistent condom use, suggesting that indoor workspaces remain essential to facilitating HIV/STI prevention for migrant SWs.

An important strength of this study was its explicit focus on structural determinants of condom use between migrant SWs and their clients. International research from low and middle-income countries and some European settings has highlighted the complexities of migration and health among marginalized women, and has identified structural determinants of migrant SWs' health as a key research gap. For example, in India inconsistent condom use among mobile and internal migrant SWs is

associated with client-perpetrated violence, as well as substance use during sex work (23,82,83), while international migrants in South Africa's sex industry face pronounced barriers to health services access, as well as protective factors (e.g., higher earnings) related to operating out of indoor venues (81). In a study conducted in London, migrant workers from Eastern Europe and the Former Soviet Union were younger, saw more clients, and faced lower risks of sexual violence, yet faced elevated barriers to contraceptive use (20). In light of these complexities, researchers have speculated that heterogeneity in HIV/STI risks and their determinants among migrant SWs may be linked to different structural features of working environments across diverse contexts and geographic settings (2,3,74), a research gap meriting further attention. Our findings from Canada contribute new knowledge by highlighting the salience of occupational conditions such as condom access in the workplace and access to formal indoor workspaces, in shaping HIV/STI prevention among migrant SWs.

In high-income contexts such as Canada, previous research indicates that SWs who operate in formal indoor environments may experience health-enabling environments compared with those in outdoor or informal settings, who often face higher rates of violence and barriers to safer sex practices such as rushed negotiation and insufficient time to screen clients (16,48,92). In Western Canada, indoor sex work largely operates as licensed businesses such as massage parlours and escort agencies (77).

Features of formal indoor work environments that may support condom use include supportive management policies, security measures that reduce the threat of violence or client condom refusal, and the availability of HIV/STI prevention resources and information (16,74,92).

While our findings highlight the importance of safer indoor sex work venues for facilitating condom use, difficulties accessing condoms pose significant challenges to the protection of sexual health and human rights of migrants in the sex industry (93). These findings are supported by previous research indicating the importance of adequate condom access in the workplace for condom use among sex workers (16,92), and are particularly important given the stigma associated with sex work and cultural barriers faced by migrant SWs in accessing condoms outside the workplace. In recent qualitative work in Vancouver (80) and elsewhere in Canada (94), the increasingly criminalized nature of sex work (e.g., Bill C-36 enacted in 2014 to criminalize third party advertisement of services and purchasing by clients (95)) has been shown to undermine and will likely exacerbate access to condoms for migrant SWs. Due to the bill's provision against third parties and unannounced police raids where condoms can be used as evidence for sex work, managers may be more reluctant to offer condoms on premises, restrict number of condoms permitted, refuse free condoms delivered by health outreach workers and enforce strict rules for storage and disposal (80). Since condom access and structural

drivers such as criminalization have not been explored in-depth among migrant SWs, there remains a need for cohort studies to evaluate the impacts of evolving structural determinants on sexual health and safety among migrant SWs over time.

Strengths & Limitations

The longitudinal nature of this study, following participants over a 3-year study period, is a major strength of this research. Although qualitative research suggests that migrant/new immigrant women may attach cultural and social norms to condom use and thus it may be possible that there is underreporting due to social desirability bias, our team has developed a strong rapport with participants (e.g., regular follow-up and outreach visits). Further, any underestimation of inconsistent condom use would have ultimately biased our multivariate results towards the null, making it more difficult to detect the associations found with inconsistent condoms use. However, these results are consistent with research in Vancouver that has shown that protections afforded by access to indoor spaces (e.g. supportive venues, practices), condom use with clients is relatively high as compared to informal indoor and outdoor sex work (16). As the AESHA study was not designed specifically to investigate migration issues, we may not have had sufficient statistical power to systematically investigate migrant-specific risks or protective factors and were limited by a lack of detailed information pertaining to

migration history and experiences (e.g., legal immigration status, access to medical and legal assistance upon arrival, socio-cultural differences between Canada and circumstances in home countries). Our study may have also underrepresented some ethnic migrant SWs in Vancouver (e.g., Latin American origin). However, our outreach team conducted extensive outreach to a diverse variety of venues where migrants engage in sex work (identified by ongoing community mapping), and were able to conduct informed consent and offer questionnaires in the primary languages spoken by potential participants (i.e., English, Cantonese and Mandarin). Continued efforts to identify and reach out to diverse migrant populations remain needed, including longitudinal and mixed methods studies with more recent cohorts of migrant SWs to better understand shifting health behaviours and outcomes by the duration and context of migration.

Recommendations for Interventions

These findings suggest the need to shift away from punitive law enforcement practices such as confiscation or use of condoms as evidence of sex work. Improved police relations in criminalized contexts can also improve work conditions, such as through increased control over working conditions and removal/reporting of violent clients (48). Additionally, safer workplace models such as those that facilitate managers'

capacity to provide HIV/STI prevention resources, connect migrant SWs to culturally appropriate outreach and services, and facilitate workplace safety, remain needed.

Policy and programmatic responses that engage and involve migrant SWs (e.g., in designing and leading occupational health interventions) and which are based on human and labour rights frameworks remain needed. Effective strategies which have been implemented internationally include increasing access to non-stigmatizing, culturally appropriate, and SW-tailored health services, as well as venue and managerial practices and policies that support sexual health and safety, such as engagement of managers in sexual health and HIV/STI prevention training (16).

Conclusion

Findings of this longitudinal study highlight the critical importance of structural determinants, including safer formal indoor workspaces and adequate condom access, for promoting HIV/STI prevention between migrant SWs and their clients. While working in formal indoor work venues can promote condom use, difficulty accessing condoms for migrants within the indoor sex industry represents a serious concern resulting from the criminalization of sex work in Canada. Interventions that positively engage managers, owners, and peers to promote condom access, health, and safety

within indoor venues are recommended to enhance migrant SWs' occupational health, and human rights.

TABLE 2.1. Individual, partner and structural factors stratified by inconsistent condom use with any client among migrant sex workers in Metro Vancouver, BC (N=182) at baseline, 2010-2013

Characteristic	Total (%) (n = 182)	Inconsistent condom use		p - value
		by clients		
		Yes (%) (n = 10)	No (%) (n = 172)	
Age, years (med, IQR)	37 (30-42)	38 (29-42)	37 (30-42)	1.000
Age at sex work entry, years (med, IQR)	34 (26-39)	26.5 (15-36)	34 (27-39)	0.074
Completed high school	149 (81.9)	3 (30.0)	146 (84.9)	<0.001
Injection drug use*	11 (6.0)	4 (40.0)	7 (4.1)	0.001
Non-injection drug use*	27 (14.8)	6 (60.0)	21 (12.2)	<0.001
Alcohol use*	106 (58.2)	5 (50.0)	101 (58.7)	0.744
Average monthly # of clients (med, IQR)*	40 (24-60)	40 (20-60)	40 (24-60)	0.622
<i>Structural determinants:</i>				
China as country of origin	140 (76.9)	4 (40.0)	136 (79.1)	0.011
Lives with others*	115 (63.2)	5 (50.0)	110 (64.0)	0.502
Sex industry as main source of income*	165 (90.7)	8 (80.0)	157 (91.3)	0.419
Average monthly income, in Canadian dollars (med, IQR)*	\$3200 (2000-6000)	\$3600 (2000-4400)	\$3200 (2000-6000)	0.995
Financially supports dependents*	100 (54.9)	5 (50.0)	95 (55.2)	0.756
Primarily works in formal indoor establishment (vs. informal indoor/ street)*	156 (85.7)	4 (40.0)	152 (88.4)	<0.001
Access to safety support from other sex workers	155 (85.2)	7 (70.0)	148 (86.1)	0.171
Difficult accessing condoms*	12 (6.6)	2 (20.0)	10 (5.8)	0.134
Client physical/ sexual violence*	11 (6.0)	2 (20.0)	9 (5.2)	0.115
Police harassment without arrest*	31 (17.0)	4 (40.0)	27 (15.7)	0.069

IQR = Interquartile Range

* All variables are baseline events/risks using last 6 months as a reference point

TABLE 2.2. Bivariate and multivariate GEE analyses of factors associated with inconsistent condom use with clients among migrant sex workers (N=182) in Metro Vancouver, BC, 2010-2013

Characteristic	Odds Ratio (OR)	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age at sex work entry, per year older*	0.92 (0.87 – 0.98)	
Completed high school*	0.16 (0.07 – 0.40)	0.22 (0.09 – 0.50)
Injection drug use**	5.24 (1.44 – 18.98)	
Non-injection drug use**	2.98 (1.20 – 7.42)	
Structural determinants		
China country of origin*	0.20 (0.08 – 0.50)	
Sex industry as main source of income**	0.26 (0.09 – 0.76)	
Primarily works in formal indoor establishment (vs. informal indoor/ street)**	0.17 (0.07 – 0.41)	0.34 (0.15 – 0.77)
Access to safety support from other sex workers**	0.42 (0.20 – 0.90)	
Difficulty accessing condoms**	4.75 (1.49 – 15.15)	3.76 (1.13 – 12.47)

CI = Confidence Interval
* Time-fixed
**Time-updated measures (serial measures at each study visit using last 6 months as reference point)

3. RECENT IM/MIGRATION TO CANADA LINKED TO UNMET HEALTH NEEDS AMONG SEX WORKERS IN VANCOUVER, CANADA: FINDINGS OF A LONGITUDINAL STUDY

3.1. INTRODUCTION

Health is regarded as a fundamental human right by international laws and policies (96). Although Canada aims to provide all legal residents with access to health services (97), literature suggests that unmet health needs are persistent and rising among the Canadian population (98,99). In particular, immigrants and migrants (im/migrants), women, and those of low socioeconomic status may face increased risk for unmet health needs (100,101). Unmet health needs can be defined as the difference between services deemed necessary to deal with a defined health problem and the services actually received (102). This includes subjective aspects such as patient perception of quality of care (103) and differing social contexts that shape help-seeking behaviour (101), rather than regarding unmet health needs as merely barriers to healthcare access. Reasons for unmet health needs in the general population have been shown to primarily include availability (e.g., lengthy waits, insufficient supply), accessibility (e.g., cost, language, transportation barriers), and acceptability (e.g., attitudes, preferences) of health services (100,104).

Among im/migrants, defined as both legal immigrants as well as migrants who move from one country to another but lack legal status (105), women often face greater difficulty accessing healthcare than men (100,101,106). Reasons for this difference may include overlapping social determinants of health such as gender roles, social class, employment options, and legal status that differentially influence access to services for women (100,101,106). In Canada, women outnumber men in 'dependent' categories of immigration (i.e., are most often the sponsored family member), and have been shown to face pervasive challenges accessing conventional labour markets in Canada (107). As such, im/migrant women arriving in Canada and other similar destination countries are overrepresented in informal sectors of work, including sex work – a population that faces acute health inequities and pervasive barriers to health access (2,14). Despite this, patterns of health access and unmet health needs among im/migrant sex workers (SWs) remain poorly understood (2).

Globally, research has shown that SWs frequently experience unmet health needs including suboptimal preventive care (e.g., sexually transmitted infections (STIs) testing and cervical screening) and inadequate treatment following abuse (i.e., rape, assault, hostility) (31,37,108–110). Research conducted in Canada has also suggested that SWs have inadequate access to sexual and reproductive health services and cervical screening (111). As many of these unmet health needs are persistent in settings where high-quality

healthcare is available and contact with general practitioners is frequently reported in the general population (109,110,112), SWs often face barriers to healthcare related to negative attitudes of healthcare providers, fear of being judged within healthcare settings, as well as the broader stigma and criminalization that shape SWs' everyday lives (30,108,112).

Prior research conducted in Vancouver, Canada has found that im/migrant SWs are more likely to face reduced access to certain health-related and preventive services, including HIV and Hepatitis C Virus (HCV) testing, as compared to their Canadian-born counterparts (30,31). In addition to sex work-related barriers to health access, im/migrant women in sex work may face additional barriers related to language differences, unfamiliarity with or lack of information regarding local health systems, concerns regarding legal immigration status, lack of insurance coverage for recent arrivals, financial barriers, isolation from health services, and differing cultural perceptions of health (30,74,97,101,113–115).

Research involving the health of im/migrant populations has often tended to treat im/migrants as fairly homogeneous, with limited attention to the type or duration of migration, gender- or occupation-specific experiences (5). However, im/migrant populations are diverse and evidence suggests that dynamic changes in legal status (e.g., temporary to permanent resident status), access to housing, social networks, and social integration experienced over the course of migration are highly linked to changes in

health status (5,49). For example, previous work has shown that some types of im/migrants are often healthier than non-migrants at the time of migration (i.e., “healthy migrant effect”) and increasingly adopt behaviours and health outcomes that are more similar to non-migrants over time (57). At the same time, however, research indicates that the most disruptive effects of migration (e.g., social isolation, unfamiliarity with health systems, lack of insurance, socio-economic deprivation) can take place immediately following arrival in a new destination, with these disruptive effects being attenuated for some im/migrant groups over time (62,63).

As these hypotheses have rarely been examined among im/migrant SWs within North American settings, and the majority of studies to date have been cross-sectional and qualitative in nature, the proposed study aims to examine the relationship between im/migration timing and other socio-structural factors (e.g., policing, violence) on unmet health needs among SWs in Metro Vancouver over time.

3.2. METHODS

Participants

Data was drawn from ‘An Evaluation of Sex Workers Health Access’ (AESHA), an open prospective cohort of street- and indoor SWs, from January 2010 to February 2014. Study participants were women (cis- and transgender), 14 years of age and older, and

had exchanged sex for money within the last 30 days. All participants provided written informed consent. Participant recruitment was conducted through time-location sampling by day and late-night outreach teams to outdoor/public sex work locations (e.g., streets, alleys), indoor sex work venues (e.g., massage parlours, micro-brothels, and in-call locations), and online solicitation spaces across Metro Vancouver. As previously described, outdoor solicitation spaces (“strolls”) and indoor sex work venues were identified through community mapping with current and former SWs (72).

Data Collection

SWs completed interview-administered questionnaires by a trained interviewer (both SWs and non-SWs) and HIV/STI/HCV serology testing by a project nurse at enrolment and biannually. The main questionnaire elicited responses related to socio-demographics, sex work patterns, physical work environment factors, and social/interpersonal and structural environment factors. Geographic data (e.g. work locations, place of health service access) were also collected to understand spatial trends in health patterns. Biolytical INSTI rapid tests were used for HIV screening, urine samples were collected for gonorrhoea and chlamydia, and blood samples were tested for syphilis, herpes simplex virus-2 (HSV-2) antibody, and HCV. All participants received an honorarium of \$40 CAD at each biannual visit for their time, expertise, and travel.

The study received ethical approval through Providence Health Care/University of British Columbia Research Ethics Board and continues to be monitored by a Community Advisory Board comprised of more than 15 community agencies (72).

Dependent Variable

Unmet health need was assessed based on the question: “How often can you get health care services when you need it, in the last 6 months?” Answers included: Always (100% of the time), usually (>75% of the time), sometimes (25 to 75% of the time), occasionally (<25% of the time), never, and non-applicable (N/A). Responses were grouped into binary categories of having experienced unmet health needs: “yes” (i.e., sometimes, occasionally, never, and N/A) versus “no” (i.e., always and usually).

Independent Variables

Time-fixed demographic and individual-level variables measured at baseline included: age (continuous), gender/sexual minority (i.e., lesbian, gay, bisexual, transgender, transsexual, or two-spirited), Indigenous (First Nations, Métis, and Inuit), im/migration timing (“non-migrant” – born in Canada; “recent im/migrant” - moved to Canada ≤5 years prior to baseline interview; “long-term im/migrant” - moved to Canada >5 years), high school completion or greater (yes versus no), and duration of sex work

(continuous). Time-updated (in last 6 months) individual and biological factors included injection and non-injection drug use, and HIV seropositivity. Interpersonal factors considered were: physical and sexual intimate partner violence (i.e., whether participants experienced physical or sexual violence by a male intimate partner, boyfriend or spouse) and lifetime abuse/trauma (i.e., yes versus no to an aggregate of verbal, physical or sexual assault by a pimp/manager, dealer, stranger, police, working women, etc.).

Time-updated socio-structural variables with occurrences in the past 6 months included: homelessness; current unstable/transitional housing status; police harassment including arrest; poor treatment by healthcare professional; and community threats/assaults (i.e., yes versus no to verbal harassment/threats or physical violence by community residents or business in the main place(s) of sex work). Work environment factors considered were social cohesion and primary place of servicing clients (i.e., “outdoor/public space” - street, park; “informal indoor” - hotel, bar; and “formal indoor” - brothel/quasi-brothel).

Statistical Analyses

Baseline descriptive statistics including frequencies and proportions for categorical variables or measures of central tendency and variability (i.e., mean, median and IQR) were calculated for all variables and stratified by whether participants reported

unmet health need in the past 6 months. Differences between SWs who reported unmet health need and those who did not at baseline were assessed using Pearson's Chi-square test (Fisher's exact test for small cell counts) for categorical variables and the Mann-Whitney U test for continuous variables.

Bivariate and multivariable generalized estimating equations (GEE) with a logit link function and exchangeable correlation structure, that account for repeated measures by the same respondents, was used to prospectively examine independent correlates of events of unmet health need over the 4-year observation period. Potential confounders as described in previous literature, factors hypothesized *a priori* to be related to unmet health needs (e.g., recent and long-term im/migration), and variables with a significance level of less than 5% in bivariate analyses were considered for inclusion in the multivariable model. Model selection was done using a backward process, with the final model being selected as the one with the lowest quasi-likelihood under the independence model criterion (QIC) value, as previously described by our group (72). Analyses were performed using the SAS software version 9.4 (SAS, Cary, NC). All p-values were two-sided.

3.3. RESULTS

Among 742 street and indoor SWs, a quarter (n = 189, 25.5%) reported unmet health needs at least once over the 4-year study period, contributing to 255 reports of

unmet health needs out of 2602 observations included. Of the 742 participants, 559 returned for at least one follow-up visit, with a median of 3 follow-up visits (Interquartile Range [IQR]: 1 to 5) and median of 21.2 months (IQR: 5.7 to 36.2) under follow-up. The median age of participants at baseline was 35 years (IQR, 28-42) (Table 1). Approximately one-quarter (24.3%) were im/migrants to Canada, with 10.5% of the cohort being recent im/migrants (i.e., ≤ 5 years) and 13.8% being long-term im/migrants (i.e., >5 years) at baseline.

In bivariate GEE analyses over the 4-year period, elevated odds of unmet health needs was significantly associated with recent im/migration (Odds Ratio [OR], 2.52; 95% Confidence Interval [CI], 1.53-4.15), long-term im/migration (OR, 1.54; 95% CI, 1.00-2.37), police harassment including arrest (OR, 1.48; 95% CI, 1.13-1.94), and lifetime abuse/trauma (OR, 1.45; 95% CI, 1.10-1.92). Participants with a shorter duration in sex work (OR, 0.98; 95% CI, 0.97-1.00), who used non-injection drugs (OR, 0.64; 95% CI, 0.48-0.85), were living with HIV (OR, 0.55; 95% CI, 0.31-0.99), and experiencing unstable/transitional housing (OR, 0.74; 95% CI, 0.55-0.99) (Table 2) were less likely to experience unmet health needs.

In the final multivariable GEE model (Table 2), recent im/migration (Adjusted Odds Ratio [AOR], 3.23; 95% CI, 1.93-5.40), long-term im/migration (AOR, 1.90; 95% CI, 1.22-2.96), police harassment including arrest (AOR, 1.57; 95% CI, 1.15-2.13), and lifetime

abuse/trauma (AOR, 1.45; 95% CI, 1.05-1.99) remained significantly and independently associated with elevated odds of unmet health needs in the last 6 months.

3.4. DISCUSSION

In this study, recent and long-term im/migration, historical violence and trauma, and policing were linked to enhanced unmet health needs among SWs in Vancouver, Canada. Recent im/migration (≤ 5 years) to Canada had the strongest independent effect on unmet health needs among SWs, with a three-fold increased odds of unmet health needs as compared to non-migrants. Long-term im/migration (> 5 years) was also associated with an almost two-fold greater odds of unmet health needs. Our findings are consistent with previous work showing connections between policing and workplace violence with reduced access to health services for SWs (75,116). This is one of the first studies to examine unmet health needs within the context of im/migration timing among SWs.

The influence of recent and long-term im/migration on unmet health needs suggest the need for increased attention to barriers to health access faced by im/migrant SWs, which may arise from both im/migration-related barriers (e.g., language barriers, legal status) as well as the barriers faced by SWs more generally (e.g., stigma, criminalization). While some previous research has reported that immigrants typically report no difference or a decreased risk for unmet health needs in comparison with non-

migrant populations (100,101), our findings are in line with qualitative and epidemiological research elucidating the disruptive impacts of im/migration on healthcare access for marginalized women (97,114,115).

The effect of im/migration timing on unmet health needs of SWs (i.e., recent im/migration having a stronger effect) is likely related to changes in social and structural determinants of health over time. Previous research suggests that im/migrants may adopt health profiles and healthcare access of im/migrants that become more similar to non-migrants as duration of residence in the destination country increases (57), which may be a possible explanation for our findings. For recent im/migrants specifically, the combination of concerns regarding legal status, low socioeconomic status, loss of social networks, precarious working conditions, unstable housing, and language barriers may culminate in greater unmet health needs (57,103,107,116,117). Among im/migrant SWs, these inequities may be magnified by macrostructural determinants related to sex work, including stigma, discrimination, and criminalization of sex work (3,16). Specifically, institutional barriers that may affect obtainment of health services for im/migrant SWs include fear of disclosing sex work to health providers, economic barriers to taking time off work to access healthcare, denial or delay of public health insurance, high cost of private health insurance, and ineligibility for social assistance and subsidized housing (32,43,107). In a recent study among SWs in Vancouver, not having a provincial health

insurance card was strongly correlated with reporting institutional-level barriers to healthcare (112). This is especially relevant among recent im/migrants awaiting the approval of provincial health insurance and those with precarious legal status (118).

Additionally, our findings may speak to the role of shifting gendered power dynamics in relation to immigration status and healthcare access. Women who move to Canada are twice as likely to be classified as 'dependent' immigrants (i.e., sponsored by spouse, family member, or employer who is required to financially support the duration of sponsorship) (119). Classification as a 'dependent' immigrant may relate to specific health-related social determinants (e.g., financial or emotional dependence on partner) (107) that have been linked to increased barriers to accessing services and adverse effects on physical and mental health (117). Further research investigating the intersections between legal status, unmet health needs, and health outcomes is recommended to examine how these dynamics change over time – for example, as im/migrant women improve their language abilities, build social networks and potentially gain enhanced access to healthcare services.

Finally, our results also speak to the importance of the broader determinants of im/migrant and non-migrant SWs' unmet health needs, including lifetime violence/trauma and policing. Previous research has shown that criminalized law enforcement approaches to sex work exacerbate HIV risk and barriers to health services

by isolating and displacing SWs, thus pushing SWs away from accessible health and support services (27,116). For example, due to police activity, street-based SWs who inject drugs may avoid health facilities and syringe exchange services (116,120). Police presence has also been linked to mistrust of authorities and fear of arrest under criminalized sex work contexts that may discourage obtainment of health services when needed (32,121). The significance of lifetime abuse/trauma perpetrated by family, friends, pimps, drug dealers, police, prison guards, and other SWs in this study, extends existing literature linking partner, client, and community-level violence to barriers and reduced access to health services (75,112,116).

Recommendations

These findings suggest the potentially disruptive effects of im/migration on healthcare access, thus contributing to unmet health needs of im/migrant SWs. As such, it is important to promote integrated health models that include community and social support services – strategies that enhance culturally appropriate, community-based delivery of health services for im/migrant SWs. Examples include SW-only drop-in centres and other low-threshold services tailored towards im/migrant SWs (e.g., Supporting Women’s Alternative Network (SWAN)), as well as outreach to hard-to-reach women (e.g., recent and undocumented im/migrant SWs). Language-specific counselling

and support services that address sexual, physical and emotional abuse as a result of violence and trauma should be made available. Policy reform in the area of immigrant health is also needed to ensure that im/migrant women are connected to care upon arrival to Canada and receive continued care during the transitions of im/migration.

Additionally, attention to broader social determinants that shape health access for all SWs, at the macrostructural (i.e., criminalization and stigma of sex work) and work environment levels (i.e., violence, policing), is needed (16). Findings support continued calls to remove punitive measures against SWs and clients (e.g., Protection of Communities and Exploited Persons Act in Canada) in order to increase support and implementation of health and social interventions for all SWs, as well as to improve police relations (41).

Limitations

While it has been previously established that health-seeking behaviours are different among individuals with different immigration statuses (115), due to the limitations of currently available data, this analysis did not include information on legal immigration status. Future studies of unmet health needs and health access among im/migrant SWs that focus on changes in legal status over the course of migration are

recommended to achieve a more nuanced understanding of im/migrants' experiences in sex work.

The prospective longitudinal design and GEE analyses of this study is a major strength as it accounts for repeated measures by the same respondent. While study findings may not be fully generalizable to other sex work settings (e.g., settings without universal healthcare), our sample included SWs from a wide range of sex work environments, including street-based, indoor, and those who operate on online spaces. Since this analysis included a series of sensitive topics (i.e., violence, trauma, drug use), cases of underreporting may have occurred as a result of social desirability bias. However, questionnaires were conducted in safe, women-only spaces by experiential (former and current SWs) and non-experiential outreach staff where a strong community rapport exists as a result of weekly outreach to outdoor and indoor sex work environments.

Conclusion

The results of this study add to existing literature on migration and sex work in positing that im/migration timing has differential effects on unmet health needs of SWs. Importantly, these results suggest that accessible and consistent health services during the early years of migration are crucial to ensure that SWs' health needs are met. Other

socio-structural factors independently associated with unmet health needs include police harassment including arrest, and lifetime abuse/trauma. These findings underscore the importance of comprehensive structural interventions for both im/migrant and non-migrant SWs, including changes across immigration, health and sex work policy (e.g., decriminalization). At the community and institutional levels, cultural and language-specific health and support services should be made available for and developed in partnership with im/migrant SWs.

TABLE 3.1. Individual and socio-structural characteristics among sex workers (n = 742) stratified by unmet health needs in Metro Vancouver, BC at baseline, 2010 – 2014.

Characteristic	Total (%) (n = 742)	Unmet Health Needs		p – value
		Yes (%) (n = 97)	No (%) (n = 645)	
<i>Individual & interpersonal factors:</i>				
Age (med, IQR)	35 (28-42)	34 (28-42)	35 (28-42)	0.966
Gender/ sexual minority				
Yes	187 (25.2)	23 (23.7)	164 (25.4)	0.717
No	555 (74.8)	74 (76.3)	481 (74.6)	
Indigenous				
Yes	261 (35.2)	32 (33.0)	229 (35.5)	0.629
No	481 (64.8)	65 (67.0)	416 (64.5)	
Timing of im/migration				
Recent (≤5 years)	78 (10.5)	18 (18.6)	60 (9.3)	0.002
Long-term (>5 years)	102 (13.8)	16 (16.5)	86 (13.3)	0.137
Non-migrant (ref)	531 (71.6)	56 (57.7)	475 (73.6)	
High school completion or greater				
Yes	397 (53.5)	52 (53.6)	345 (53.5)	0.982
No	345 (46.5)	45 (46.4)	300 (46.5)	
Non-injection drug use*				
Yes	502 (67.7)	53 (54.6)	449 (69.6)	0.003
No	240 (32.4)	44 (45.4)	196 (30.4)	
Injection drug use*				
Yes	291 (39.2)	27 (27.8)	264 (40.9)	0.014
No	451 (60.8)	70 (72.2)	381 (59.1)	
HIV seropositivity				
Yes	81 (10.9)	6 (6.2)	75 (11.6)	0.109
No	653 (88.0)	90 (92.8)	563 (87.3)	
Duration of SW, years (med, IQR)	10 (3-17)	5 (2-17)	10 (3-18)	0.021
<i>Socio-structural factors:</i>				
Homeless*				
Yes	229 (30.9)	29 (29.9)	200 (31.0)	0.825
No	513 (69.1)	68 (70.1)	445 (69.0)	

Currently in unstable/ transitional housing				
Yes	507 (68.3)	56 (57.7)	451 (69.9)	0.016
No	235 (31.7)	41 (42.3)	194 (30.1)	
Barriers to health care – poor treatment by health care professional*				
Yes	106 (14.3)	20 (20.6)	86 (13.3)	0.056
No	636 (85.7)	77 (79.4)	559 (86.7)	
Primary place of service*				
Informal indoor venue	194 (26.2)	25 (25.8)	169 (26.2)	0.242
Formal/ in-call establishment	234 (31.5)	42 (43.3)	192 (29.8)	0.005
Outdoor/ public space (ref)	314 (42.3)	30 (30.9)	284 (44.0)	
Social Cohesion Scale (med, IQR)	0.2 (-0.5-0.9)	0.4 (-0.4-1.2)	0.1 (-0.5-0.9)	0.084
Police harassment, including arrests*				
Yes	292 (39.4)	39 (40.2)	253 (39.2)	0.854
No	450 (60.7)	58 (59.8)	392 (60.8)	
Arrested or charged for solicitation in public spaces*				
Yes	15 (2.0)	2 (2.1)	13 (2.0)	1.000
No	727 (98.0)	95 (97.9)	632 (98.0)	
Had been threatened/ verbally assaulted by community residents or businesses*				
Yes	105 (14.2)	14 (14.4)	91 (14.1)	0.932
No	637 (85.9)	83 (85.6)	554 (85.9)	
Any physical/ sexual violence by intimate partner*				
Yes	109 (14.7)	16 (16.5)	93 (14.4)	0.590
No	633 (85.3)	81 (83.5)	552 (85.6)	
Lifetime trauma/abuse				
Yes	547 (73.7)	60 (61.9)	487 (75.5)	0.004
No	195 (26.3)	37 (38.1)	158 (24.5)	

* All variables using last 6 months as reference point.

Table 3.2. Bivariate and multivariable GEE analyses of factors associated with unmet health needs among SWs (n = 742) in Metro Vancouver, 2010 – 2014.

Characteristic	Unadjusted		Adjusted	
	Odds Ratio (95% CI)	p - value	Odds Ratio (95% CI)	p - value
<i>Individual & interpersonal factors:</i>				
Age (per year older)	0.99 (0.97 – 1.01)	0.222		
Timing of im/migration*				
Recent vs. none	2.52 (1.53 – 4.15)	<0.001	3.23 (1.93 – 5.40)	<0.001
Long-term vs. none	1.54 (1.00 – 2.37)	0.049	1.90 (1.22 – 2.96)	0.005
High school completion or greater*				
(yes vs. no)	1.11 (0.81 – 1.51)	0.517		
Duration of SW (per year increase)	0.98 (0.97 – 1.00)	0.034		
Non-injection drug use [†]				
(yes vs. no)	0.64 (0.48 – 0.85)	0.003		
HIV seropositivity [†]				
(yes vs. no)	0.55 (0.31 – 0.99)	0.047		
<i>Socio-structural factors:</i>				
Currently in unstable/transitional housing				
(yes vs. no)	0.74 (0.55 – 0.99)	0.039		
Primary place of service [†]				
Informal indoor vs. outdoor	0.97 (0.72 – 1.31)	0.835		
Formal indoor vs. outdoor	1.45 (0.98 – 2.16)	0.066		
Police harassment, including arrests [†]				
(yes vs. no)	1.48 (1.13 – 1.94)	0.004	1.57 (1.15 – 2.13)	0.004
Had been threatened/ verbally assaulted by community residents or businesses [†]				
(yes vs. no)	1.42 (0.94 – 2.12)	0.093		
Lifetime trauma/abuse				
(yes vs. no)	1.45 (1.10 – 1.92)	0.009	1.45 (1.05 – 1.99)	0.023

*Time-fixed.

[†]Time-updated (serial measures at each study visit using last 6 months as reference point).

4. IMPACTS OF IM/MIGRATION EXPERIENCE ON WORK STRESS AMONG SEX WORKERS IN VANCOUVER, CANADA

4.1.INTRODUCTION

Globally, women frequently migrate for improved economic opportunities, family reunification, improved health, and enhanced security (2,4). However, migrant women frequently face substantial barriers to income-earning opportunities in destination countries (e.g., language barriers, discrimination, limited recognition of foreign education and credentials) despite increasing pressure for female participation in the workforce (6,8). In light of this, women and migrants are often more likely to work within temporary, informal, and less-regulated labour markets, including child care, domestic work, and sex work (2,122).

In many contexts – particularly those within which sex work is criminalized – sex work can be classified as a precarious employment arrangement, defined as work that is non-standard, poorly paid, or where workers' rights are not regulated or guaranteed (7,8,10). The instability and insecurity inherent in precarious employment has been linked to significant occupational health risks and previous work suggests that women are over-represented within precarious labour markets (7). Sex work has not previously been examined extensively as a form of precarious employment, although there is some

evidence emerging regarding employment conditions associated with sex work as compared to other types of informal work (123,124). Alongside debates regarding the legalities of sex work, there is also a need for more empirical research demonstrating the risks associated with unregulated employment conditions for sex workers (SWs), particularly those associated with migration and immigration (im/migration).

The negative working conditions faced by SWs are highly influenced by macrostructural policies, notably the criminalization of sex work and the human rights violations, stigma, and lack of occupational standards (16,41). In the face of criminalization and the absence of appropriate, rights-based regulatory frameworks, SWs face disproportionate exposure to occupational risks such as violence, health-related concerns (e.g., HIV, STIs), marginalization, exclusion from labour and human rights, and high levels of stigma and discrimination (125). While sex work research that adopts a labour rights perspective is scarce, social science studies suggest that everyday conditions and illnesses related to sex work including violence, repetitive stress injuries, musculoskeletal problems, bladder infections, and work-related stress may be of more immediate concern to SWs than risk of HIV (13,16,32,65,74). Moreover, research on precarious employment has identified stress as an important pathway linking precarious employment arrangements and health (e.g., psychological and physiological health, well-being, coping behaviours) (7). As such, we posit that the work stress resulting from poor

working conditions speaks to the unregulated and precarious nature of sex work in criminalized settings (34,126).

Current qualitative evidence from Canada and elsewhere indicates that within the sex industry, poor working conditions, stigma and criminalization may be especially pronounced among im/migrant workers, who often face additional concerns and stressors related to language barriers, fear of disclosure of sex work to family or healthcare workers, racism and discrimination, and legal status (e.g., denial of or revocation of immigration status, deportation/repatriation) (13–15). Although limited work has been conducted explicitly on the health impacts of precarious employment among im/migrants within the sex industry, studies from the United States among the general population report that im/migrants and ethnic minorities frequently work within more unsafe and potentially precarious work environments characterized by inadequate occupational and safety standards, discriminatory and potentially abusive treatment, and sexual harassment (127–130).

While the precarious employment conditions faced by SWs in criminalized contexts may be closely linked to work stress, there remains a paucity of research on work stress among SWs, with most research focused on general occupational health hazards, psychological stress, and burnout (13,131–134). Work stress may be most relevant to assess in sex work criminalized settings as the underground nature, punitive

enforcement-based approaches, and high levels of stigma associated with sex work have been shown to contribute to psychological stress among street-based and crack using SWs in global research (135,136).

Work stress, as defined by Karasek's Demand-Control Model, is conceptualized as a result of high job demands (e.g., time pressures, heavy workloads, role ambiguity and role conflict) and low job control, including low skill discretion and decision authority (137). A recent study by our team in Vancouver concluded that SWs experience higher overall work stress than the general working Canadian population (138). Building on this initial work, the current study seeks to examine the longitudinal association between im/migration experience and different types of work stress (e.g., job demand, decision authority) in a large cohort of SWs in Metropolitan Vancouver, Canada.

4.2. METHODS

Study Design

From January 2010 to September 2014, longitudinal data was collected from "An Evaluation of Sex Workers Health Access" (AESHA), a community-based, prospective cohort in Metro Vancouver, British Columbia, Canada. This study was initiated in 2005 in collaboration with sex work agencies and continues to be monitored by a Community Advisory Board consisting of >15 community agencies (72). Participant eligibility

included self-identifying as a cis- or trans woman, having exchanged sex for money in the last 30 days, and providing written informed consent. Recruitment was conducted through time-location sampling (139) through daytime and late-night outreach to outdoor/public sex work locations (i.e. streets, alleys, industrial settings) and indoor sex work venues (e.g., formal sex work establishments/'in-call' venues such as massage parlours; informal venue-based sex work such as bars, hotels; and SWs independent self-advertising through online or newspapers), across Metro Vancouver. The study was approved by Providence Health Care/University of British Columbia Research Ethics Board.

At enrolment and bi-annually, SWs complete an interview-administered questionnaire by experiential (former and current SWs) and non-experiential interviewers, followed by pre-test counseling questionnaire and serological HIV/STI/HCV testing by a project nurse. Interviewers ask questions related to socio-demographics, migration timing and history, sex work patterns, drug use patterns of SWs and their clients, work stress, physical work environment factors, social/ interpersonal environment factors, and structural environment factors. The pre-test counseling questionnaire collected data on overall physical, mental and emotional health, sexual and reproductive health, and HIV testing and treatment experiences. Lastly, HIV/STI/HCV serology testing is conducted using Biolytical INSTI rapid tests for HIV screening, with

reactive tests confirmed by blood draw for western blot. Urine samples are collected for gonorrhea and chlamydia, and blood is drawn for syphilis, HSV-2 antibody, and HCV. All cohort participants receive \$40 CAD at each visit. Treatment is provided onsite for symptomatic STI infections, and free serology and Papanicolaou testing are provided regardless of study enrolment.

Work Stress Sub-scales

A 13-item work stress scale was adapted from the 'work stress' index included in the Canadian Community Health Survey (CCHS), a condensed version of Karasek's Job Content Questionnaire (JCQ) (140–142,138). As previously described, exploratory factor analysis using varimax rotation was used to determine the number of factors present among the items, using a maximum likelihood method (138). Item inclusion for sub-scale creation was based on consultations with AESHA project staff. Factor loadings were used to determine the number of items included within each factor. Additionally, Tucker and Lewis's Reliability Coefficient yielded a score of ~1.0. Following factor analysis, 10 items of the 13-item work stress scale were grouped into the following three sub-scales: (1) skill discretion; (2) decision authority; and (3) job demands (Table 1). Item responses were measured on a five-point Likert scale ranging from 'strongly agree' to 'strongly disagree,' and were scored in ascending order with the exception of four items included in the job

demands sub-scale. Items were summed to yield a continuous measure for each sub-scale, with a higher score indicating higher work stress.

Cronbach's α was used to assess internal consistency within each sub-scale (Table 1). Consistent with previous studies using Karasek's abbreviated JCQ scale (141,142), our sub-scales had modest internal consistency, largely due to the low number of items included in each sub-scale and indicating a lack of redundancy in the measures (i.e., suggesting that each item added a new dimension to the overall measure) (143).

Main Exposure Variable

Given our interest in examining the links between duration of im/migration experience and work stress, this variable was coded as recent im/migrant (i.e., moved to Canada ≤ 5 years), long-term im/migrant (i.e., moved to Canada > 5 years), and non-migrant (i.e., born in Canada, which was the reference category).

Work Stress Outcomes

We examined each of the three work stress sub-scales as time-updated outcome variables with last six months as a reference point: (1) skills discretion; (2) decision authority; and (3) job demands. Sub-scales were continuous measures with skill discretion and decision authority scored in ascending order ('strongly agree' as 1,

'strongly disagree' as 5) and job demands scored in descending order ('strongly agree' as 5, 'strongly disagree' as 1). The total scores for each sub-scale were 10 for skill discretion, 20 for decision authority, and 20 for job demands.

Confounder Variables

Potential confounders were determined from previous research and hypothesized *a priori* to be associated with work stress. Time-fixed variables measured at baseline included: age (continuous); high school completion; gender/sexual minority (e.g., lesbian, gay, bisexual, transgender, transsexual, or two-spirited); and duration of sex work (continuous, in years). Time-updated variables were measured as events within the prior 6 months and included: average monthly income, hours worked per shift, and paying a manager or pimp (defined as whether or not a manager, administrator, bookkeeper or pimp received a share of one's income from sex work), primary place of servicing clients, workplace violence, and intimate partner violence. Primary place of servicing clients was defined as having serviced clients in an outdoor/public (e.g., street, parks, public washrooms), informal indoor (e.g., hotel, client's place, home-based), or formal indoor space (e.g., massage parlour, brothel, micro-brothel). Workplace violence was assessed as a composite measure consisting of physical, verbal, sexual violence or abuse perpetrated by clients, other SWs, community residents/businesses, police, or security guards.

Intimate partner violence (IPV) was measured using the World Health Organization (WHO) IPV scale and included physical, sexual, and emotional violence (144).

Statistical Analyses

The sample was restricted to 545 SWs who provided valid answers to the work stress scale. Descriptive statistics were calculated for all variables, including frequencies and proportions for categorical variables and measures of central tendencies (i.e., mean, median, interquartile range [IQR]) for continuous variables stratified by im/migration experience.

Bivariate linear regression using generalized estimating equations (GEE) (145) with an exchangeable correlation structure was used to examine associations between potential confounders and each workplace stress sub-scale (i.e., skill discretion, decision authority and job demands) over the 4-year study period. β coefficients and 95% Confidence Intervals (95% CI) were calculated to indicate the direction and strength of association with each workplace stress sub-scale. In bivariate analyses using GEE, we examined the independent effects of im/migration experience (i.e., recent, long-term, and no migration) on each of the three work stress sub-scales. For the two scales with which im/migration experience was significantly associated in bivariate analysis (i.e., decision-making and job demands), we constructed separate multivariable GEE confounder

models, adjusting for key *a priori* confounders that were significant in bivariate analyses. The final models were determined using a manual backwards selection approach, where variables that altered the association of interest by less than 5% were systematically removed (146). All p-values are two-sided, and SAS statistical software version 9.4 was used for all analyses (SAS Institute, Cary, North Carolina, USA).

4.3. RESULTS

In total, 545 participants were included in the study, contributing to 1960 observations over a 4-year follow-up period. 432 participants completed at least one follow-up visit, with a median of 3 follow-up visits (Interquartile Range [IQR]: 2-5) and median of 25.5 months (IQR: 15.1-36.1) under follow-up. Of the 545 participants, 9.7% (n=53) were recent im/migrants (≤ 5 years), 13.9% (n=76) were long-term im/migrants (>5 years), and 76.2% (n=415) were Canadian-born (Table 1). In a sub-analysis of available data on legal im/migration status in the AESHA cohort, 68.3% of im/migrants held permanent resident status upon initial entry to Canada. Most reported their current im/migration status to be either naturalized Canadian citizens (51.7%) or permanent residents (40.0%).

Median scores for job demands at baseline were high across the sample (maximum score of 20) and were lowest for recent im/migrants (12.0, IQR: 11.0-14.0), followed by

long-term (13.0, IQR: 11.0-14.0), and non-migrants (14.0, IQR: 12.0-16.0), p -val <0.01 (Table 1). Recent im/migrants logged more working hours (10.0 hours, IQR: 7.0-12.0) compared to long-term (8.0 hours, IQR: 5.3-10.0) and non-migrants (3.0, IQR: 1.0-6.0). A smaller proportion of recent and long-term im/migrants experienced workplace violence in comparison to non-migrants (11.3% for recent, 29.0% for long-term, 58.8% for non-migrants), p -val <0.01 , and both recent and long-term migrants were significantly more likely to pay a manager compared to non-migrants (92.5% for recent, 69.7% for long-term, and 7.0% for non-migrants), p -val <0.01 .

In bivariate GEE analysis, im/migration experience was significantly and negatively associated with decision authority and job demands (Table 3), whereas im/migration was not significantly associated with skills discretion. Other confounders which were significantly associated with decision authority and job demand in bivariate analysis included age, having paid a manager, primary place of servicing clients, workplace violence (i.e., combined physical, sexual, and verbal abuse or assault by clients, other SWs, residents/businesses, police, and security guards), and intimate partner violence (Table 2).

In a multivariable GEE confounder model, recent (β coefficient: -0.91, 95% CI: -1.54 to -0.29) and long-term im/migrants (β coefficient: -0.84, 95% CI: -1.37 to -0.31) faced decreased work stress related to job demands in comparison to Canadian-born

participants, after adjustment for key confounders (Table 4). While decision authority also followed the same trend, this association was not retained after adjusting for the same confounders.

4.4. DISCUSSION

Previous research conducted in Vancouver, Canada has found that overall work stress is 1.3 times higher in SWs compared to the general working population in Canada (138). The current study builds on that research by examining the effects of im/migration experience on various facets of work stress. Given evidence of the serious health and social inequities often experienced by im/migrant workers, the finding that recent (≤ 5 years) and long-term im/migrant (> 5 years) SWs experienced decreased job demands as compared to Canadian-born counterparts was unanticipated. A similar but non-significant trend was observed for decision authority, and no differences by im/migration experience were observed for skill discretion.

Although both im/migrant and Canadian-born SWs continue to experience serious concerns related to criminalization and unregulated working conditions (e.g., harassment by authorities and police, restrictive municipal by-laws, sex work-related stigma, and criminalization), the lower job demands reported among im/migrant SWs in this study may in part reflect work experiences in formal in-call and indoor sex work

establishments, in comparison with sex work in street-based and informal settings. A large proportion of im/migrant SWs in this study reported working in managed indoor contexts, which have been shown to be highly protective for SWs' health and well-being (43,48). Formal in-call/indoor sex work venues offer safer working environments by allowing for management policies whereby managers and staff have increased capacity to remove violent or uncooperative clients, as well as enhanced safety mechanisms including bad date reports and security cameras (48). Moreover, some formal in-call/indoor sex work establishments have been shown to enhance SWs' agency and control over work conditions (e.g., condom and payment negotiation), and foster peer support among SWs (16,48). These work environment factors may culminate to minimize work-stress inducers, thereby decreasing job demands felt by im/migrant SWs as compared to their Canadian-born counterparts.

Job demands also varied significantly by im/migration experience, which may be explained by changes in working conditions attributable to the new opportunities and challenges experienced by im/migrant workers over the course of arrival and long-term settlement in destination settings (43). For example, work-related stress inducers for im/migrant SWs such as language barriers, economic insecurity, and unfamiliarity with sex work laws have been shown to change over time (42,126,147). Additionally, while most sex work research has focused on health and safety risks, qualitative research has

found that im/migrant SWs often value the flexibility, independence, and higher earnings of sex work compared to other informal labour (6,8).

While both job demands and decision authority experienced by SWs follow a clear trend according to im/migration experience, job demands scores were generally high and decision authority scores generally low across all im/migration categories, suggesting high overall work stress among all SWs (138). These results may be explained by stigma, criminalization, and a lack of occupational standards associated with sex work (34,42,131,132,148) that cumulatively impose negative work conditions (33). Stigma associated with sex work raises barriers to healthcare and support services and increases SWs' exposure to violence (34,36,132). Current Canadian legal frameworks surrounding sex work (*The Protection of Communities and Exploited Persons Act*) (16,41,44) engender poor working conditions, lack of workplace protections, and increased health and social inequities among SWs (41). For example, within sex work criminalized settings, impromptu police raids of indoor venues have been found to discourage SWs and managers from reporting violence and deter managers from providing adequate protections for workers (e.g., condoms can be confiscated by police as "evidence"), thereby decreasing overall decision authority of im/migrant SWs (41). As such, it is not surprising that SWs have ranked police raids as one of the most psychologically stressful occurrences in the workplace (32). Negative working conditions also speaks to the

precariousness of sex work, whereby work environments are heavily determined by venue managers rather than the needs of workers, resulting in inadequate supply of onsite HIV/STI prevention resources and disregard of sex workers' health and safety (7,41).

Strengths and Limitations

As one of the only large-scale cohorts of SWs in North America, the longitudinal design of this study is a major strength of this study and accounts for repeated measures by the same respondent over time. Adaptation of the CCHS work stress index to the context of sex work for the AESHA study is another novel approach. The examination of work stress sub-scales adapted for the first time to the context of sex work in Canada allowed for quantification of different facets of work stress with regards to im/migration experience for the first time. Utilization of this scale also allows for comparisons between the general Canadian population and sex work population, and frames sex work as a form of productive labour.

As with all studies, several limitations arise from this study. Firstly, while study findings may not be fully generalizable to other settings, our sample spans a diverse range of sex work environments (e.g., street-based, indoor, and online spaces) identified through extensive and ongoing community mapping. Secondly, social desirability bias

may arise from the sensitive nature of the questionnaire (i.e., sexual behaviour, violence, trauma, drug use). However, interviews are conducted in safe, women-only spaces to ensure privacy by a team comprised of experiential (former/current SWs) and non-experiential staff. Weekly outreach to indoor and outdoor sex work environments by our team also cultivates very strong community rapport with study participants. Lastly, the sub-analysis conducted to describe trends in legal immigration status in our study population was not systematically collected at the same time as the other data included in our study. As such, this data was not eligible for inclusion in our multivariable models. Future work investigating the role of legal status in relation to work stress and other occupational health and safety concerns among im/migrant SWs is recommended.

Conclusion

First and foremost, findings highlight the urgent need to decriminalize sex work in order to begin the necessary shift towards providing SWs with adequate labour and human rights and improved health. In a global review of structural determinants and HIV among female SWs, it was estimated that decriminalization of sex work in Canada could prevent ~40% of incident HIV cases in the next ten years through decreased violence, improved police relations, and safer work environments (16). While decriminalization of sex work is a necessary starting point, it is not sufficient to reduce or

eliminate the precariousness associated with sex work. Additional occupational health and safety regulations that address the unique needs and risks of SWs must be developed.

Occupational health models guided by labour and human rights frameworks, such as the New Zealand Prostitution Reform Act (2003), are promising as they set standards for commercial practice, health and safety regulations, zoning by-laws, and specifies manager and worker obligations – thus shifting the responsibility of setting workplace standards on employers (149). Supports at the community level including sex work collectives, unions, and policies are also needed to promote occupational health and improved working conditions for SWs (13,16). Examples include the Service Employees International Union in San Francisco and the Australian Liquor, Hospitality and Miscellaneous Workers Union, entities that aim to protect sex worker's occupational rights and reduce job stress (13). Sex work collectives and associated services offering culturally-sensitive and language-specific supports for im/migrant SWs would be well-placed to address additional stressors faced by this subgroup of SWs.

Table 4.1. Work Stress Scale: Sub-scale properties of work stress among 545 women sex workers in Metro Vancouver at baseline, 2010 to 2014.

Work Stress Sub-scales	Properties	
	Mean, range Median (IQR)	Cronbach's α (categorical)
Skill Discretion† 1. Your job required you to learn new things 2. Your job required a high level of skill	5.9, 6.0 (4.0, 8.0)	0.58
Decision Authority† 1. Your job allowed you freedom to decide how you did your job 2. You were free from conflicting demands that others made (e.g., pimps, clients) 3. You had a lot to say about what happened in your job (e.g., compared to your pimp, madam) 4. You had the materials and equipment you needed to do your job (e.g., condoms, regular STI tests)	9.0, 9.0 (8.0, 10.0)	0.52
Job Demands†* 1. Your job required that you do things over and over 2. Your job was very hectic 3. Your job required a lot of physical effort 4. You were exposed to hostility or conflict from the people you worked with (e.g., other workers, pimp, madam)	13.6, 14.0 (12.0, 16.0)	0.60

Response scale from 1 to 5 (strongly agree, agree, neither disagree nor agree, disagree, strongly disagree).
 * Items reverse-scored. Strongly agree=5, strongly disagree=1
 †Last 6 months

TABLE 4.2. Characteristics of 545 women sex workers in Metro Vancouver at baseline, stratified by im/migration experience, 2010 to 2014.

Characteristic	Recent im/migrant (≤5 years) n (%) (n = 53)	Long-term im/migrant (>5 years) n (%) (n = 76)	Canadian-born n (%) (n = 415)
<i>Workplace sub-scale scores:</i>			
Skill discretion (med, IQR)	6.0 (4.0-7.0)	6.0 (4.0-7.0)	6.0 (4.0-8.0)
Decision authority (med, IQR)	8.0 (7.0-10.0)	8.0 (7.0-10.0)	9.0 (8.0-10.0)
Job demands (med, IQR)	12.0 (11.0-14.0)	13.0 (11.0-14.0)	14.0 (12.0-16.0)
<i>Individual factors:</i>			
Age (med, IQR)	37.0 (30.0-42.0)	40 (34.5-43.0)	34.0 (28.0-42.0)
High school completion (yes vs. no)	49 (92.5)	57 (75.0)	166 (40.0)
Gender/sexual minority (yes vs. no)	1 (1.9)	8 (10.5)	136 (32.8)
Duration of sex work (med, IQR)	1.0 (0.0-2.5)	4.5 (2.0-10.0)	14.0 (7.0-22.0)
<i>Interpersonal & workplace factors:</i>			
Avg monthly income, per \$1000 CAD (med, IQR)*	2.9 (1.6-6.0)	2.7 (1.6-4.0)	1.8 (0.8-4.0)
Avg number of hours/shift (med, IQR)*	10.0 (7.0-12.0)	8.0 (5.3-10.0)	3.0 (1.0-6.0)
Paid manager (yes vs. no)*	49 (92.5)	53 (69.7)	29 (7.0)
Primary place of servicing clients*			
Informal indoor venues	2 (3.8)	8 (10.5)	210 (50.6)
Formal in-call sex work venues	49 (92.5)	57 (75.0)	16 (3.9)
Outdoor/public space	2 (3.8)	11 (14.5)	189 (45.5)
Workplace violence (yes vs. no)*†	6 (11.3)	22 (29.0)	244 (58.8)
Intimate partner violence*			
Experienced violence by partner	2 (3.8)	2 (2.6)	55 (13.3)
No violence by partner	26 (49.0)	38 (50.0)	112 (27.0)
Did not have an intimate partner	25 (47.2)	35 (46.1)	240 (57.8)

*In the last 6 months

†Workplace violence variable is a combined variable of 1) Physical/ sexual violence from clients; 2) Verbally threatened or experienced violence by another SW; 3) Threatened/verbally assaulted by community residents/ businesses; 4) Police harassment, without arrest; and 5) Physical, verbal, sexual abuse by security guard

Table 4.3. Bivariate GEE analysis of factors associated with decision authority and job demands among 545 women sex workers in Metro Vancouver, 2010 to 2014.

Characteristic	Decision Authority		Job Demands	
	β -coefficient (95% CI)	p - value	β -coefficient (95% CI)	p - value
<i>Primary explanatory variable:</i>				
Im/migration experience				
Recent (≤ 5 years)	-0.77 (-1.18, -0.36)	<0.001	-1.35 (-1.90, -0.80)	<0.001
Long-term (>5 years)	-0.50 (-0.93, -0.08)	0.020	-1.27 (-1.78, -0.77)	<0.001
No migration	REF		REF	
<i>Individual factors:</i>				
Age	-0.04 (-0.05, -0.02)	<0.001	-0.04 (-0.06, -0.02)	<0.001
High school completion	-0.19 (-0.47, 0.09)	0.186	-0.14 (-0.52, 0.24)	0.464
Gender/sexual minority	0.26 (-0.07, 0.58)	0.128	0.62 (0.21, 1.02)	0.003
Duration of sex work	0.01 (-0.01, 0.02)	0.410	0.02 (-0.01, 0.04)	0.131
<i>Interpersonal & workplace factors:</i>				
Avg monthly income*	0.00 (-0.03, 0.04)	0.811	0.03 (-0.02, 0.07)	0.255
Avg hours per shift*	0.00 (-0.02, 0.02)	0.950	0.02 (-0.01, 0.04)	0.176
Paid manager*	-0.47 (-0.72, -0.22)	<0.001	-0.51 (-0.82, -0.20)	0.001
Primary place of servicing clients*				
Informal indoor venues	-0.28 (-0.50, -0.05)	0.015	-0.65 (-0.93, -0.38)	<0.001
Formal in-call sex work venue	-0.95 (-1.29, -0.61)	<0.001	-1.51 (-1.96, -1.07)	<0.001
Outdoor/public space	REF		REF	
Workplace violence*	0.39 (0.20, 0.58)	<0.001	0.87 (0.63, 1.10)	<0.001
Intimate partner violence*				
Experienced violence by partner	0.02 (-0.29, 0.33)	0.910	0.70 (0.29, 1.11)	<0.001
No violence by partner	-0.26 (-0.51, -0.01)	0.043	-0.13 (-0.45, 0.19)	0.428
No intimate partner	REF		REF	
Unadjusted β -coefficients and 95% Confidence Intervals with two-sided p-values are provided.				
*In the last 6 months				

Table 4.4. Multivariable GEE confounder models examining the independent effect of im/migration experience on decision authority and job demands among 545 women sex workers in Metro Vancouver, 2010 to 2014.

Explanatory variable	Outcomes	
	Decision Authority β-coefficient (95% CI)	Job Demands β-coefficient (95% CI)
Recent im/migration (≤5 years)	-0.40 (-0.88, 0.08)	-0.91 (-1.54, -0.29)
Long-term im/migration (>5 years)	-0.14 (-0.59, 0.32)	-0.84 (-1.37, -0.31)
Canadian-born	REF	REF

Confounder models adjusted for age, intimate partner violence, having a manager, and workplace violence.

NOTE: Skill discretion sub-scale was not considered for the multivariable confounder analysis as the bivariate association with im/migration experience was not significant ($p>0.05$).

5. DISCUSSION

5.1. SUMMARY OF THESIS FINDINGS

Despite the substantial overrepresentation of im/migrant women within the sex industry in Canada and elsewhere (2,3), the relationship between im/migration experience and sex workers' sexual health, access to healthcare, and occupational health have not been well studied in North America or elsewhere. As such, this thesis aimed to address this research gap by investigating three health-related issues within the context of im/migrant sex work: (1) HIV/STI prevention (i.e., inconsistent condom use with clients) among im/migrant sex workers (2) unmet health needs among sex workers and variations by im/migration experience (recent, long-term, and no migration); and (3) work stress among sex workers and variations by im/migration experience. These analyses drew on a structural determinants of health framework and identified the relationship between intersecting determinants related to sex work criminalization, work environments, and im/migration experiences and HIV/STI prevention, unmet health needs, and work stress.

5.1.1. HIV/STI prevention

To characterize factors influencing HIV/STI prevention among im/migrant sex workers, logistic regression with GEE was used to model individual, partner, and structural-level correlates of inconsistent condom use with clients over a 3-year period among 182 im/migrant sex workers born outside Canada (Chapter 2). Multivariable GEE results showed that while working in in-call/formal indoor establishments (e.g., massage parlours, managed indoor spaces) and high school attainment were protective against inconsistent condom use, difficulty accessing condoms was independently correlated with increased odds of inconsistent condom use by clients among im/migrant sex workers.

These findings illustrate how the intersection between working conditions and sex work criminalization jointly shape im/migrant sex workers' capacity to successfully negotiate HIV and STI prevention practices within the workplace. As has been suggested by prior research, formal sex work venues that include enhanced security measures, supportive staff, provision of adequate condoms and other harm reduction equipment can foster HIV/STI prevention (16,32,74,92). However, the criminalization of sex work and associated punitive enforcement strategies that target third parties (e.g., police raids, restrictive venue by-laws, laws criminalizing third party advertising or benefitting economically from the sale of sexual services) (32,94,150,151) can reduce condom

accessibility and exacerbate sex work stigma. These concerns may be exacerbated among im/migrant women who may face enhanced fears and stressors related to immigration-related legal or social consequences of policing within the workplace, such as deportation or a loss of im/migration status (16,92).

5.1.2. Unmet need for healthcare

Given reports of rising unmet health needs among women and im/migrants in Canada and previous evidence of significant barriers to healthcare access faced by sex workers (98–100), Chapter 3 assessed the relationship between structural determinants, including im/migration experience (recent, long-term, vs. no migration experience) and unmet health needs over a 4-year study period using GEE among 742 im/migrant and non-migrant sex workers. Over one-quarter of participants reported unmet health needs during the study. In multivariable GEE analysis, recent im/migration to Canada (≤ 5 years) had the strongest independent effect on increased unmet health needs among sex workers, followed by long-term im/migration (> 5 years).

Study findings may indicate the disruptive effects of im/migration on unmet health needs, with recent im/migrants experiencing the most unmet health needs, followed by long-term im/migrant sex workers. This trend may be explained by changing social and structural determinants of health over the course of migration whereby the

health and health access of im/migrants differ over time (5,49). For example, barriers to healthcare access faced by recent im/migrants such as precarious legal status, low socioeconomic status, loss of social networks, unstable housing, and language barriers may contribute to increased unmet health needs upon initial arrival and settlement but may become less pronounced over long-term settlement (103,107). While these findings are not entirely unique to sex workers, they do speak to unmet health needs of im/migrant workers engaged in informal labour, including sex work, who do not have access to standard occupational health and safety. Unmet health needs experienced by im/migrant sex workers may also be explained in part by the ways in which the criminalization of sex work uniquely impacts im/migrant sex workers (e.g., joint sex work criminalization and precarious legal status may enhance disrespectful treatment by health care providers, fear of exposure of sex work and legal status) (16,112). As such, there is a call for increased support for culturally safe and community-based support interventions that address the unique needs of im/migrant sex workers. Examples of such services include SWAN in Vancouver and Butterfly in Toronto – organizations that offer social support, outreach, and advocacy initiatives specifically tailored towards im/migrant and newcomer women in sex work (152,153)

5.1.3. Work stress

To date, public health research has only recently begun to frame sex work through a labour rights perspective, despite the importance of doing so in order to address the precarious and unsafe working conditions associated with the sex industry. Moreover, these precarious conditions directly impact health and safety outcomes, particularly for more marginalized segments of the industry, such as im/migrant and racialized women (8,12). Chapter 4 attempted to highlight sex work-specific occupational health concerns and variations by im/migration experience by longitudinally analyzing the relationships between im/migration experience and different facets of work stress (e.g., skill discretion, decision authority, job demands) among 545 im/migrant and non-migrant sex workers over a 4-year period. Findings indicated that recent im/migrants experienced the lowest job demands, followed by long-term im/migrants and Canadian-born sex workers. A similar but non-significant trend by im/migration experience was observed for decision authority, whereas no clear trend was observed for skill discretion. However, overall job demands scores were high and decision authority scores were low across all categories of im/migration experience.

Trends observed by im/migration experience are somewhat unanticipated given evidence of significant health and social inequities faced by im/migrant workers documented in prior research (13–15). However, im/migrant sex workers in the current

study report similar levels of perceived work stress as compared to a sample of immigrants as represented in a large, population-based sample (154). Possible explanations for the findings observed for job demands may speak to changes in working conditions as a result of opportunities and challenges faced by im/migrants over the course of arrival and long-term settlement (43). For example, qualitative evidence shows that im/migrant sex workers value the higher pay, steady income, and flexibility of sex work, with some describing sex work as a substantial improvement to their economic well-being as compared to economic circumstances in home countries (17). Lower self-reported job demands among im/migrant sex workers may also be attributed to characteristics of formal indoor establishments, where im/migrant sex workers largely operate, which have been shown to promote increased safety and support from managerial staff and peers (43,48). This points to the importance of formal worksites in offering enhanced labour and safety protections, thereby alleviating work stress among im/migrant workers – working in formal sex work venues confer similar levels of work stress on im/migrant sex workers as other formal workplaces confer on broader immigrant populations.

Despite trends observed by im/migration experience, high job demand scores and low decision authority scores (i.e., a proxy for the amount of control one has over their work) across all im/migration categories suggest that sex workers face enhanced work

stress as compared to the general Canadian working population (138). Findings suggest the crucial need for policies that remove legal restrictions impacting im/migrant workers' access to labour protections, as well as policies that support occupational health and safety of all sex workers.

5.2. IMPLICATIONS AND FUTURE AREAS FOR RESEARCH

5.2.1. Implications and Recommended Interventions

Community-level approaches to improve HIV/STI prevention and healthcare access

In this thesis, difficulty accessing condoms was found to be a key barrier to HIV/STI prevention for im/migrant sex workers (Chapter 2), and higher unmet health needs among sex workers (Chapter 3) were reported by recent and long-term im/migrants as compared to Canadian-born sex workers. Additionally, key reasons for unmet health needs were found to include im/migration-related (e.g., unstable legal status, language barriers) as well as institutional barriers (e.g., fear of disclosing sex work to health providers, denial or delay of public health insurance). These findings speak to the urgent need for community-led programs and interventions tailored specifically to im/migrant sex workers in order to appropriately address the unique barriers to HIV/STI prevention and healthcare access experienced by this population.

Currently, several services specifically tailored to im/migrant sex workers exist in Canada including “Supporting Women’s Alternatives Network” (SWAN) in Vancouver, Butterfly in Toronto, and the Agincourt Community Services Association (ACSA) Massage Parlour/Micro-brothel Outreach Project servicing Scarborough, Ontario (155). These organizations offer culturally safe, non-judgmental and language-specific support and services (e.g., massage parlour/micro-brothel outreach, online outreach, education, advocacy) for newcomer and im/migrant women who engage in indoor sex work (9,71,152). Further support for these organizations and their expansion to municipalities beyond current service regions is recommended, particularly to enhance accessibility for women who live and work outside of current service areas.

Other well-established community-led interventions for sex workers exist and could also be culturally adapted for im/migrant subgroups. In Vancouver, “Women’s Information Safe Haven Drop-In Centre Society” (WISH) is a sex work-specific drop-in space that provides women sex workers with basic primary care, everyday necessities, and a mobile outreach service (156), which has been shown to effectively link sex workers with sexual and reproductive health services (111). Globally, the St. James Infirmary in San Francisco (157) and the Sonagachi Project in Calcutta, India (158) are support services that are based on empowerment and participatory models. These services are largely sex worker-run, address occupational health and safety of sex work, encompass multifaceted

and interdisciplinary interventions at the individual and community levels, and have been associated with lower HIV rates among sex workers; these services are regarded as best practices by the World Health Organization (WHO)/ Joint United Nations Programme on HIV/AIDS (UNAIDS) (157,158).

Occupational health and safety measures & sex work collectivization

This thesis identified high levels of work stress among sex workers, as well as key links between im/migration experience and job demands as related to work stress (Chapter 4). These findings speak to the precariousness associated with sex work in criminalized settings, in which sex work is unregulated in terms of human and labour laws. As such, findings of this analysis recommend the implementation of occupational health and safety standards, including legislation and policies that shift the responsibility of setting workplace standards to employers (i.e., venue managers, owners), as well as support for sex work collectivization

Occupational health and safety models for the sex work industry from New Zealand and parts of Australia, where sex work has been decriminalized, should be considered as best practices and potentially adapted to the Canadian context (16,65,66,149). In 2003, the Prostitution Reform Act (PRA) in New Zealand decriminalized sex work, thereby enhancing labour rights for sex workers (159). Occupational health and

safety regulations following this policy reform included provisions on work conditions such as number of hours worked, paid sick leave and vacation, pensions, and provision of adequate equipment (e.g., condoms, showers, beds and massage tables) by employers (13,149).

Sex work unions have also been shown to be an important means of promoting occupational health and encouraging collectivization among sex workers; examples include the Australian Liquor, Hospitality and Miscellaneous Workers' Union, the Service Employees International Union of the American Federation of Labour and Congress of Industrial Organization, and various sex work collectives in Brazil (4,13,160). These groups recognize sex work as work and have advocated for occupational standards including provisions on discrimination, sexual harassment, family and personal leave, pay, pensions, job evaluation, breaks, and dismissals – provisions that seek to improve working conditions, security and stability for sex workers (4,160).

While no formal sex work unions currently exist in Canada due to the continued criminalization and social exclusion of sex workers, advocacy groups such as SWAN (Vancouver) are actively lobbying for improved health, safety, and workers' rights specific to the needs of im/migrant sex workers (e.g., legal status, language barriers, mobility) at municipal, national, and international levels. In April 2016, members of

SWAN met with Members of Parliament to bring forward im/migrant sex workers' concerns with regards to current sex work laws and law enforcement (161).

Overarching Implications and Recommendations for Research, Policy and Practice

In addition to implications specific to each of the thesis objectives, several cross-cutting principles apply across all three thesis objectives, namely decriminalization of sex work and reforms to im/migration policy. These overlapping implications have the potential to enable many of the intervention approaches and policy changes suggested previously.

i. Decriminalization of sex work

Findings of this thesis illustrate the role of sex work criminalization in undermining the protective effects of formal indoor sex work venues and community-level health outreach and service interventions, thereby enhancing risks for HIV/STIs, poor healthcare access, and stressful and unsafe working conditions among both im/migrant and non-migrant sex workers. As such, decriminalization of sex work is an overarching policy reform needed for enabling improved working conditions (e.g., access to condoms, health services, HIV prevention and treatment, and ensure adequate

occupational safety and labour rights) for sex workers, thereby alleviating some of the precariousness associated with sex work as well as improving health outcomes.

Decriminalization of sex work has been widely linked to improved sexual health outcomes. In a 2015 global review and modeling exercise, it was projected that decriminalization of sex work globally would prevent 33 to 46% of new HIV infections among sex workers and their clients in the next decade (16). Impacts of decriminalization in New Zealand, as a result of the PRA, have also resulted in improved health and human rights and enforcement of workplace occupational health and safety standards for sex workers (149). For example, sex workers have reported increased agency to demand safe working conditions and negotiate terms of sexual transactions; improved police relations and increased capacities to report violence and abuse; and fewer cases of coercion and exploitation within the workplace by venue managers, pimps, and clients (149,162,163).

ii. Im/migration policies

Im/migration experience, as illustrated in this thesis, represents another structural factor that can shape HIV/STI prevention, health access, and occupational health and safety among sex workers through a number of mechanisms. Certain aspects of im/migration experience have been shown to have negative effects on health access and outcomes (e.g., language barriers, cultural differences, insecure immigration statuses,

and unfamiliarity with services in destination countries); at the same time, im/migration has also been linked to safer indoor work environments, lower HIV/STI rates, and lower work stress, as determined previously and by this thesis (3,6,112). While this thesis focuses on sex workers specifically, many of these determinants have also been reported within general im/migrant populations – particularly those working in informal or precarious sectors of work, who fear deportation due to unstable immigration status, and/or who face decreased access to support and healthcare services due to racialization, stigmatization, or insurance-related barriers (12,107).

Based on findings of this thesis, policies that promote skills and language training, and that serve to lower barriers to services are recommended for all im/migrants. One such example is Vancouver’s proposal to become the next ‘Sanctuary City’ in Canada – a strategy that intends to reduce barriers to healthcare access and promote the human rights of im/migrants (164). The proposed “Access to City Services Without Fear (ACSWF) for Residents with Uncertain or No Immigration Status” Policy, proposed in March 2016, will enable local residents to access municipally funded services (e.g., shelters, food banks, police services, libraries, community centres) without having to provide immigration status to service providers (e.g., hospitals) (165), as the current requirement to provide such information has been shown to pose a serious barrier to care. Implementation of this policy is expected to improve access to health care, social services,

and legal services for undocumented migrants and women with precarious legal/immigration status (i.e., temporary visas, family sponsored) (166). This policy reform is expected to connect recent and new im/migrants to services and healthcare upon arrival and during the transitions of im/migration, a crucial period of transition as determined by this thesis. Although such policies have the potential to mitigate some of the barriers to social support and health services faced by im/migrant sex workers – for example, by removing stigma and fear surrounding unstable legal status – further efforts are needed to address the ways in which concerns regarding im/migration status intersect with fears surrounding sex work involvement and criminalization for im/migrant women engaged in sex work.

5.2.2. Implications for Future Research

This thesis addresses the paucity of public health research surrounding im/migration and sex work in North America and sheds light on several key health concerns as experienced by im/migrant sex workers – barriers to HIV/STI prevention, unmet health needs, and work stress. However, this work has also identified a number of knowledge gaps that warrant further research.

Firstly, future research evidence regarding legal im/migration status (e.g., temporary visa, permanent resident, naturalized Canadian citizen) is needed to better understand

the effects of im/migration experiences on health outcomes among sex workers and other populations of marginalized women. Broader research on the lived experiences of hidden populations of im/migrant sex workers from more diverse countries of origin or ethnic groups is recommended in order to inform programming and resource allocation towards specific im/migrant subgroups (e.g., recent or newly arrived, undocumented), ensure that consistent social and health services are provided throughout the process of im/migration, and develop more universal migrant health policies. For example, research findings can expand upon migration and health policy instruments developed by the WHO and United Nations (UN) – policies that do not currently address sex work and migration specifically (5). .

Secondly, research on pre-migration factors among sex workers – such as socio-economic status, health status, and reasons for migration in home countries – is recommended for better understanding of the nuanced factors underpinning changes in im/migrant sex workers' health across the migration process. For example, forced migrants who have experienced traumatic events may have underlying psychological or physical health concerns that are distinct from those who migrate as economic immigrants who have undergone health screening (5). These underlying factors may significantly shape health status, and health-seeking behaviour of im/migrants in destination countries. Qualitative and mixed-methods research that employ a life-course

perspective may be especially beneficial to obtain a better understanding of the lived experiences of sex workers pre- and post-migration.

Thirdly, as data collection for this thesis was conducted prior to recent changes made to Canadian sex work laws (Bill C-36), future research assessing the impact of these policy reforms on im/migrant sex workers' health is essential for informing future sex work law reforms and health-related programs for im/migrant sex workers. For example, studies assessing how access to HIV/STI prevention, healthcare services, and occupational safety measures have changed after policy reforms are recommended.

Lastly, more research must be done to assess the precariousness of sex work in the context of criminalized settings. This research is especially crucial as both developed and developing economies are shifting towards more precarious employment arrangements (10). Within the context of sex work specifically, there is a need to develop appropriate occupational health and safety, including culturally safe considerations in the case for im/migrant sex workers, to inform best practices globally and in Canada.

5.3. STRENGTHS AND LIMITATIONS

The use of prospective, longitudinal data from one of the largest cohorts of sex workers in North America was a major strength of this thesis. The analyses employed longitudinal statistical modeling with time-updated measures (e.g., GEE regression

methods) to account for repeated measures among subjects across baseline and follow-up visits. This approach accounts for within-subject correlation and allows for more accurate estimates of regression coefficients, as well as greater analytic precision for binary response variables (89). The prospective design of these analyses are unique as most research regarding HIV/STI prevention and healthcare access among im/migrant and non-migrant sex workers has been cross-sectional or qualitative in nature.

Another novel approach employed by this thesis was the adaptation of the work stress index from the Canadian Community Health Survey (CCHS) to the context of sex work for the first time in Canada (137). The examination of work stress sub-scales (i.e., skill discretion, decision authority, job demands) allowed for quantification of different facets of work stress with regards to im/migration experience for the first time, and can facilitate comparisons of work stress between sex workers and the general Canadian population.

Finally, this thesis drew on a structural determinants of health framework for sex workers (16,38) to examine intersecting structural determinants of health as well as the effects of im/migration experiences on health outcomes and well-being of sex workers. The use of a three-way im/migration experience variable to account for im/migration duration was particularly important for observing trends for different health and social issues (e.g., unmet need for healthcare, work stress) in a way that is unique from previously published research.

Limitations

Several key limitations should be considered in interpreting the findings presented in this thesis. Due to the heavily stigmatized, hidden, and marginalized nature of sex work, rather than using a random sampling methodology, data collection was based on community mapping and time-location sampling (72). Time-location sampling is a probability-based sampling method used in contexts where the population of interest is hidden. As such, enrolment strategies target places where the population is likely to congregate (139). As research involving hidden and criminalized populations is often subject to potential selection bias, we engage in extensive recruitment and follow-up efforts, including ongoing weekly outreach and recruitment efforts by experiential (current and past sex workers) and non-experiential multilingual staff with community experience, as well as expansion of recruitment to diverse online spaces. This has resulted in strong rapport and community connections within the sex work community across a wide range of work environments and neighbourhoods, and has enabled us to recruit a large and diverse sample of sex workers for AESHA.

Secondly, the AESHA study captures the experiences of both Canadian-born and im/migrant sex workers from primarily Asian countries, the most common of which is China – demographics which are known to be quite similar to the general profile of sex workers in Vancouver. Through AESHA, a multilingual team of English, Cantonese, and

Mandarin-speaking front-line staff engage in regular outreach to a diverse array of indoor and outdoor sex work venues across Metropolitan Vancouver. This team is expanding outreach efforts to online spaces for study recruitment and continued outreach to informal and formal indoor sex work venues. Despite these continued efforts to tap into a broad diversity of sex work venues and populations, certain hard-to-reach groups, such as deportees, undocumented women, or women from different countries of origin, may be underrepresented in AESHA.

Thirdly, analyses included in this thesis utilized self-reported data regarding sexual behaviour and history, illicit drug use, violence and trauma – topics that may be perceived as sensitive and may be subject to social-desirability bias or high rates of non-response among study participants – although this would have biased results to the null. To address the potential for social desirability bias and enhance participant comfort and trust with the research process, participants have the option of completing interviews and nursing components of the study in a variety of locations (e.g., one of two AESHA offices, home, work, outreach van) to ensure safety and confidentiality. Ongoing weekly outreach to sex work strolls and indoor sex work venues have also established great rapport between interview staff with study participants, creating a safe atmosphere for participants to share expertise and limiting the potential for social-desirability bias.

Lastly, as the AESHA study was originally conceptualized as a study of indoor and on-street sex workers and was not designed to investigate the health effects of im/migration experiences specifically, more detailed im/migrant-specific measures were not captured (e.g., legal immigration status, reasons for migration) initially. As such, Chapters 3 and 4 were limited to investigating the effects of duration of im/migration experience on various health outcomes. As the questionnaire has since been updated to include a more comprehensive sub-study of im/migration history, legal status, and im/migrant-specific health and social barriers and challenges, future analyses of these more nuanced im/migration-related measures will be important for understanding im/migrant-specific experiences with regards to sex work.

5.4. CONCLUSION

This thesis contributes new knowledge to sex work and im/migrant health research by investigating sexual health and HIV/STI risk, unmet health needs, and work stress among sex workers and according to variations by im/migration experience. In Chapter 2, inconsistent condom use with clients among im/migrant sex workers was significantly associated with difficulty accessing condoms. Chapters 3 and 4 demonstrated trends by im/migration experience for both unmet health needs and work stress among sex workers. In Chapter 3, recent im/migrants experienced the highest unmet health needs

when compared to Canadian-born sex workers, suggesting that newly arrived im/migrant sex workers face the highest barriers when it comes to healthcare access. In Chapter 4, results showed that while sex workers faced high levels of work stress overall, recent and long-term im/migrants experienced significantly lower job demands compared to Canadian-born counterparts. This suggests that perception of work stress among im/migrants may be influenced by changing experiences of working conditions during arrival and early settlement and speak to the role of supportive formal work environments.

Thesis findings highlight the health-related barriers and opportunities faced by im/migrant sex workers and demonstrate the ways in which criminalization, work environments, and im/migration experiences intersect to differentially affect health outcomes according to sex workers' im/migration experience. Suggested interventions include decriminalization of sex work, efforts to support sex work collectivization (particularly for im/migrant sex workers), and interventions to promote culturally safe occupational health and safety models within the sex industry, all of which represent evidence-based strategies to promote and support the health, human rights, and labour rights of sex workers (151,167,168). Of particular importance, im/migrant-tailored strategies that are language and culturally specific, and that account for different phases of im/migration remain critically needed.

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