**Modern Slavery: Violence, Coercion and Mental Health of Female and Male Trafficking Survivors
in the Mekong Sub-region: Cambodia, Thailand, and Vietnam**

by

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Dedication

Este trabajo está dedicado a la memoria de las mujeres más amadas y más importantes en mi vida, mi mamá y mi abuela

A la memoria de mi mamá, Maria Luisa Ríos Martinez, por su infinito amor, integridad, dedicación, humildad, generosidad y fortaleza. Por instigar en mí el deseo de estudiar y aprender. Gracias mamá.

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no importa el tiempo y la distancia, me ha sostenido en los momentos difíciles de mi vida y ha

iluminado mi vida con risas y esperanza.

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List of Abbreviations

AIC: Akaike Information Criteria

BCH: Bolck, Croon, and Hagenaar

BIC: Bayesian Information Criteria

CI: Confidence intervals

DSM: Diagnostic and Statistical Manual of the American Psychiatric Association

GBV: Gender-based violence

GEE: Generalized estimation equations

GLO.ACT: Global Action to Prevent and Address Trafficking in Persons and the Smuggling of Migrants

GMS: Greater Mekong Sub-region

HSCL-25: Hopkins Symptom Checklist-25

HTQ: Harvard Trauma Questionnaire

ICD-10: International Classification of Diseases

ILO: International Labour Organization

IPV: Interpersonal violence

IOM: International Office of Migration

LCA: Latent class analysis or model

LK: Ligia Kiss

LSHTM: London School of Hygiene and Tropical Medicine

NET: Narrative exposure therapy

NGOs: Non-Governmental Organizations

OR: Odds ratios

PRs: Prevalence ratios

PTSD: Post-traumatic stress disorder

QIC: Quasi-likelihood under the Independence Model Criterion

SCID-4: Structural Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-4)

STEAM: Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region

TF-CBT: Trauma-Focused Cognitive-Behavioral Therapy

TIP: Trafficking in Person's Report

TVPA: Trafficking Victims Protection Act

UNODC: United Nations Office on Drugs and Crime

UN.GIFT: United Nations Global Initiative to Fight Human Trafficking Disorders

WHO: World Health Organization

Abstract

Background: Human trafficking is a crime and a violation of fundamental human rights that affects 40.3 million people worldwide. The Asia Pacific region accounts for the largest number of forced laborers including children, adolescents, and adults of both sexes. Previous research has reported a high prevalence of poor mental health among trafficking survivors, but limited research has assessed the sex-specific associations of trafficking-related exposures on the mental health of survivors of trafficking across different trafficking sectors

Methods: This dissertation uses data from the Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM). Aim 1 analyzes first the association of violence (sexual, physical, or both) and coercion (personal and family threats) with mental health symptoms (anxiety, depression, and PTSD) by sex. Aim 2 examines how the living, working, and legal and economic insecurity conditions during trafficking affect the mental health of trafficking survivors, female and male. Aim 3 describes patterns of violence and coercion using a latent class analysis approach, assessing the association of these latent classes with mental health.

Results: For females, both physical and sexual violence were associated with higher levels of anxiety, PTSD, and depression, while for males, exposure to physical violence with threats made with weapons was strongly associated with PTSD. Coercion in females was particularly strongly related to anxiety and PTSD, especially among those receiving both personal and family threats.

Deprived conditions during trafficking were strongly associated with poor mental health in both females and males, but sex-related differences were observed. While for females, living conditions were strongly associated with anxiety, PTSD, and depression, the association in males in each of the three outcomes more than doubled. Excessive working hours were associated with poor mental health in females and males. For men and boys working excessively was associated strongly with anxiety, depression, but particularly with PTSD symptoms. For females, there was a twofold increase in PTSD for those working excessively. Being in a detention center or jail in the country of exploitation was strongly associated with anxiety, PTSD, and depression in males.

Two different patterns of violence and coercion were identified in females and in males. A twofold higher prevalence of anxiety and PTSD was found in females classified as being exposed to "severe sexual and physical violence and coercion" compared to females exposed to "sexual violence and coercion." For males the associations for PTSD and depression were elevated among those who were exposed to the class of "severe physical violence and coercion" relative to the "personal coercion" class but the findings were not statistically significant.

Conclusions: Measuring the human trafficking experience is complex as it occurs in diverse labor sectors beyond sexual exploitation and affects both females and males of all ages. The experience of violence and coercion is pervasive yet multidimensional and differs by sex with profound effects on the mental health of trafficked female and male survivors. Exploitation as embodied in the trafficking experience entails abuse, violence, and deprived living and working conditions with profound consequences for mental health. Implementation of public health approaches at all levels of the spectrum of prevention (primary, secondary, and tertiary) and acknowledging the social determinants of health as major structural forces are fundamentally important to prevent and address human trafficking.

Chapter 1

Introduction

Background and Significance

Human trafficking is increasingly recognized as one of the fastest growing crimes and

human rights violations with important public health implications worldwide (1, 2). The United

Nations Convention Against Transnational Organized Crime and its Protocol to Prevent,

Suppress, and Punish Trafficking in Persons, Especially Women and Children provide both the

first agreed-upon international definition of trafficking in persons and a framework of obligations

and standards for member states to elaborate national responses to fight human trafficking (2):

a) Trafficking in persons shall mean the recruitment, transportation, transfer, harboring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation, forced labor or services, slavery or practices similar to slavery, sexual exploitation, servitude or the removal of organs.
b) The consent of a victim of trafficking in persons to the intended exploitation set forth in subparagraph (a) of this article shall be irrelevant where any of the means set forth in subparagraph (a) have been used;
c) The recruitment, transportation, transfer, harboring or receipt of a child for the purpose of exploitation shall be considered "trafficking in persons".
d) Child shall mean any person under 18 years of age. (Article 3)

Human trafficking can include, but does not require, movement. For instance, exploited

and enslaved individuals can also be considered trafficking survivors if they were exposed to

coercive and deceptive practices, subjected to bonded labor, or born into a state of servitude.

Similarly, they may have consented to work for a trafficker, been transported to the exploitative situation, or participated in illegal activities as a result of being trafficked (3).

While the conditions mentioned above on what constitutes trafficking are comprehensive, an important caveat is that often, law enforcement requires the presentation of solid evidence that exploitation has occurred. The reality is that human trafficking cases are cumbersome and often start with the testimony of victimization of the trafficked survivor only, which may not be sufficient evidence to prosecute the case (3).

Modern slavery, human trafficking, forced labor, and human exploitation are terms used to describe crimes that involve life-threatening forms of torture, abuse, violence, and coercion that are suffered by children, women, and men worldwide with the purpose of economic exploitation (4). These terms will be used interchangeably in this dissertation, although the constructs are distinct as they have their own sociopolitical, legal, and historical connotations (5–7).

Human trafficking is a multidimensional and complex problem that involves many forms of human exploitation (e.g., sexual or labor exploitation, hereditary slavery) and it is deeply rooted in social and economic inequities fueled by organized crime, poverty, gender inequity, the demand for low-wage labor and sex work, social displacements, political corruption, conflicts, and wars (7-11). Globalization and economic liberalization exacerbates human exploitation by contributing to social, economic, and political inequity and instability in regions and countries in which forced labor is often widespread in the form of human trafficking, such as Southeast Asia (7, 12).

The International Labour Organization (ILO) reports conservative estimates that, globally, roughly 40.3 million people are in forced labor situations as a result of debt bondage,

trafficking, or other forms of modern slavery (13). Of the global total, 28.7 million or 71% are women and girls and 11.6 million or 28.9% are men and boys. In other words, approximately six adults out of every 1,000 adults and five children for every 1,000 children worldwide are in forced labor conditions at any given point in time (13). Forced labor is highly profitable with revenues of US$150 billion in illegal profits per year (14). The ILO identifies the following as indicators of forced labor: abuse of vulnerability, deception, restriction of movement, isolation, physical and sexual violence, intimidation and threats, retention of identity documents, withholding of wages, debt bondage, abusive working and living conditions, and excessive working hours (15).

Survivors of human trafficking represent a diverse and heterogeneous population in age, sex, home country, and exploitation experience that occur in various economic sectors, such as sex work, fishing, domestic work, agriculture, and factory work (16). Given the global dimensions and effects of labor exploitation on public health (2, 3, 17), it is increasingly important to consider the factors that shape the health of survivors of trafficking. Previous research suggests that the mental health of trafficking survivors is related to violence experienced during trafficking (18–21). Mechanisms contributing to patterns of violence may include dynamics of power and control exercised by traffickers that either involve direct forms of violence (physical, sexual violence, or both) or indirect coercion such as harassment, intimidation, instigation of a sense of helplessness, restriction of freedom, or direct and indirect forms of violence (18-20, 22-24). Although associations between violence and mental health have been documented among people primarily trafficked for sex work (9, 10, 19, 20, 22), less information is available on the sex-specific associations of violence, coercion, and contextual

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factors (living, working, legal, and economic insecurity) on the mental health of trafficked individuals exploited in various labor sectors.

Thus, this research proposes to address the following unresolved questions: Are violence and coercion, living and working conditions, and legal and economic insecurity during trafficking associated with poor mental health in females and males? Are specific patterns of violence and coercion during trafficking identifiable in females and males? No studies of which I am aware have examined these questions among a diverse sample of trafficking survivors.

Examining patterns in the risk profiles of trafficked persons may have important social, clinical and population health implications, particularly for the population trafficked for labor exploitation, a group that historically has received less attention than that exposed to sex trafficking. Identifying subgroups with greater mental disease risk among survivors of trafficking could inform the development of, or adaptation of, treatment interventions and programs to better serve the needs of this population. Answering these questions offers a unique opportunity to further our understanding of the impact of human trafficking on mental health.

Collecting and accessing reliable data is complicated because of the criminal and underground nature of trafficking (3, 25). The present dissertation examines a diverse and large sample of women, men, adolescents, and children trafficked in different labor sectors with an array of information on violent coercive factors and contextual factors (living, working, and legal and economic insecurity conditions). This will allow the characterization of how the experience of being trafficked exerts its effects on the mental health of trafficking survivors.

Human Trafficking or Forced Labor in the Greater Mekong Sub-region

The International Labour Organization (ILO) indicates that of 40.3 million people in slavery conditions, 24.9 million are forced laborers and 15.4 million people are in forced

marriage arrangements. The Asia Pacific region, which includes the greater Mekong sub-region (GMS), accounts for the largest number of forced laborers (62% of the global total) and it is the second largest region with the highest prevalence of forced marriage, where four out of every 1,000 people suffer from labor exploitation and two out of every 1,000 people are in a forced marriage situation (13).

The GMS is made up of six countries connected by the Mekong River: Cambodia, China, Laos People's Democratic Republic, Myanmar, Thailand and Vietnam. The GMS is recognized as a priority area in Asia for human trafficking since high levels of undocumented migration between the GMS countries is thought to be linked to a high incidence of trafficking and exploitation of migrants (7, 26-29).

The 2017 *Trafficking in Person's Report* (*TIP*) prepared by the US Department of State is a comprehensive worldwide report on foreign governments' efforts to combat trafficking in persons (3). The report was prepared using information provided by US embassies, government officials, non-governmental and international organizations, published articles and reports, research trips, and information submitted to the State Department. The report is used by international organizations, foreign governments, and non-governmental organizations alike as a tool to examine where resources are most needed. In the following paragraphs, I describe some of the key features of human trafficking indicated by the 2017 *TIP* in Cambodia, Thailand, and Vietnam, the countries in which the data for the study were collected.

Cambodia, Thailand, and Vietnam are countries that function as source, transit, and destination for women, men, and children subjected to forced labor and sex trafficking.

Cambodia. Cambodian adults and children migrate to countries within the region and, increasingly, to the Middle East for work. Exploitation in commercial sex, domestic servitude,

debt bondage, forced labor on fishing vessels, the agricultural sector, or factories is common. Cambodian migrant workers, especially in Thailand and Malaysia, are vulnerable to forced labor and debt bondage. Employers in destination countries of exploitation tend to withhold copies of employment contracts and confiscate legal documents. Recruitment agencies are also known to falsify legal identification and age verification documents to facilitate illegal recruitment of children.

Cambodian women and girls usually migrate to Malaysia to work in domestic service; as they often travel on tourist visas and transit through Thailand, some become victims of domestic servitude. Corrupt officials in Cambodia, Thailand, and Malaysia work with labor brokers to facilitate the transportation of victims across the border. Many Cambodian males are subjected to forced labor on Thai fishing boats operating in international waters where they are subjected to deceptive recruitment, severe abuses, and are forced to remain aboard vessels for years. Children from deprived families are highly vulnerable to forced labor, including domestic servitude and forced begging in Thailand and Vietnam. Vietnamese women and children, many of whom are victims of debt bondage, are forced into commercial sex work in Cambodia.

Vietnam. Vietnam is another source country for men and women who migrate abroad for work independently or through state-owned, private, or labor-export recruitment companies. Some are subjected to forced labor in construction, fishing, agriculture, mining, logging, manufacturing, and other sectors primarily in Taiwan, Malaysia, South Korea, Laos, the United Arab Emirates, and Japan—and to a lesser extent in China, Thailand, Cambodia, Indonesia, Europe, North Africa, Latin America, or the Middle East. Vietnamese women and children are subjected to sex trafficking throughout Asia, particularly in China, Cambodia, Malaysia, and Russia. Vietnamese women are also part of internationally brokered marriages in various Asian

countries and are subjected to domestic servitude, sex work, or both. Vietnamese authorities and non-governmental organizations (NGOs) have reported Vietnamese men, women and children subjected to forced labor within the country. Boys and girls are usually trafficked for sex work or subjected to street peddling, begging, or forced labor in restaurants in major urban centers of Vietnam.

Thailand. Thailand is a relatively wealthy country within the GMS area and attracts a steady migration flow in search of jobs from its poorer neighboring countries, in addition to China, Vietnam, Russia, Uzbekistan, India, and Fiji. Tens of thousands of trafficking victims, by conservative estimates, are migrants from Cambodia, Laos, Malaysia, and Myanmar (Burma), all neighboring countries of Thailand. Trafficked individuals are usually coerced or defrauded into labor or exploited in the sex trade. Thailand's commercial sex industry is extensive, which increases the vulnerability of immigrants to sexual exploitation. Within Thailand, labor trafficked individuals are exploited in commercial fishing, fishing-related industries, low-end garment production, factories, domestic work, and street begging, among others (3).

More specifically, the Mekong region includes very diverse patterns of human trafficking, such as internal and cross-border trafficking; highly organized and small-scale trafficking; sex and labor trafficking; and both formal and informal recruitment mechanisms that target women, men, girls, boys, and families (3, 30). Therefore, within the GMS there is a wide range of trafficked individuals and criminal profiles.

Trafficking Victims Protection Act. According to the 2017 *TIP* (3), none of the governments of Cambodia, Thailand, or Vietnam fully comply with the Trafficking Victims Protection Act's (TVPA) minimum standards for the elimination of human trafficking that involve promoting a policy of "3 Ps": prosecution, protection, and prevention, as stated in article

2 of the United Nations Convention Against Transnational Organized Crime and its Protocol to Prevent, Suppress, and Punish Trafficking in Persons, Especially Women and Children (2):

- **Prosecution** involves law enforcement actions and prosecution.

- **Protection** entails identification of victims, provision of benefits and services regardless of their immigration status (e.g., case management, housing, legal services).

- **Prevention** involves raising awareness of human trafficking but also enforcing labor laws and developing and monitoring programs to protect workers from exploitation, which requires collaborative partnerships with stakeholders (e.g., law enforcement, government, NGOs) and effective policy implementation and enforcement.

Global Action to Prevent and Address Trafficking in Persons and the Smuggling of Migrants. In 2010, the United Nations launched the Global Action to Prevent and Address Trafficking in Persons and the Smuggling of Migrants (GLO.ACT), a four-year (2015–2019), joint initiative by the European Union and the United Nations Office on Drugs and Crime (UNODC) to strengthen the three Ps and add a fourth P for "partnership" between states and within regions (31). These partnerships were developed within the United Nations under the Inter-Agency Coordination Group against Trafficking in Persons and the United Nations Global Initiative to Fight Human Trafficking (UN.GIFT), and also through public-private partnerships (31, 33).

While the TVPA and the GLO.ACT are important global efforts to tackle human trafficking, some scholars argue that their focus is more useful for law enforcement, placing emphasis on strengthening border control and criminalization of trafficking, while diminishing the importance of trafficking survivors' well-being and health (21, 33). Given that human trafficking implicates acts of exploitation, abuse, deception, and coercion, understanding the effects of such a crime on the mental health of trafficking survivors merits further investigation.

Mental Health of Survivors of Trafficking

Population health studies on the mental health of trafficking survivors remain limited, with most of the evidence from studies of women trafficked primarily for sexual exploitation. A recent systematic review of 37 studies from 2004 to 2011 on the prevalence and risk of violence, and the mental and sexual health of trafficked individuals (34) reported only one prospective cohort among all the studies, one that assessed the mental health of trafficked Moldavian women survivors forced into sexual and labor exploitation in various countries, such as Turkey, Russia, and countries in Eastern Europe (35). Six published cross-sectional studies (with sample sizes > 30) assess the mental health of female trafficking survivors (9, 10, 20, 22, 35, 36), while only two studies included men and children (18, 37). In these studies, survivors of trafficking were exploited in Europe (United Kingdom, Italy, Belgium, Czech Republic, Bulgaria), Nepal, Moldova, Ukraine, Israel, Southeast Asia, and the United States. The remaining studies listed in the systematic review are cross-sectional or case file reviews of non-governmental organizations (NGOs), providing post-trafficking support services with a focus on violence and physical or sexual health (34).

The majority of prior studies on trafficking used non-validated questionnaires or single questions to assess experiences of violence. Overall, these previous studies indicated that, in particular for women and girls trafficked for sexual exploitation, high levels of physical and sexual violence are prevalent during trafficking. Trafficking survivors are at high risk of experiencing a range of physical, mental, and sexual health problems. The populations in the studies mentioned above include trafficked individuals for sexual exploitation experiencing various degrees of violence. Only one study (10) used a sample of women exploited for sex work

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and other labor sectors (exploited in domestic and circus work). These studies were conducted in European countries and Nepal.

Studies in which screening instruments were used to assess mental health outcomes reported a high prevalence for anxiety (48.0%–97.7%), depression (54.9%–100%), and Post-traumatic stress disorder (PTSD) (19.5%–77.0%) (9, 10, 20). One of the most comprehensive studies was a prospective cohort study of Moldavian women that assessed mental health by a psychiatrist 1 to 5 days after registering with post-trafficking support service, using the *International Classification of Diseases*, 10th revision (*ICD-10*) clinical criteria, and then at 2–12 months using the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (SCID-4) to diagnose mental health outcomes (35). Three cross-sectional studies also assessed mental health with clinical interviews using *ICD-10* diagnostic criteria and the SCID-4 (22, 35, 36), but the vast majority of studies used standardized and validated screening instruments of mental health symptoms, such as the Harvard Trauma Questionnaire and the Hopkins Symptoms Checklist-25 (9, 10, 19, 20). All studies found that women survivors of trafficking had high levels of adverse mental health symptoms.

The cohort study of Moldavian women reported that mental disorders were highly prevalent; 88% of women in the sample met ICD-10 criteria for mental disorders and 54% continued to have clinical diagnoses for common mental disorders 2–12 months after returning to their country and receiving post-trafficking support services as part of their reintegration (35). Thirty-six percent had PTSD (alone or comorbid), 12.5% had depression without PTSD, and 6% had another anxiety disorder. The Nepalese study found differences in levels of depression (100% vs. 81%) and PTSD (30% vs. 8%) among women trafficked for sexual exploitation compared to the non-sex-worker group (10).

Only three recent studies assessing health problems associated with trafficking included males (18, 19, 37). One analyzed case records from an NGO providing services to 35 men and women between 2009 and 2010 (19). Almost half of the sample (40%) reported experiencing physical violence while they were trafficked and being threatened with violence against themselves or their families, while 23% had witnessed violence while trafficked. Mean scores for symptoms of anxiety and depression were slightly elevated for women compared to men, and 57% reported one or more PTSD symptoms. Another study also used case files to identify trafficked people with severe mental illness in the United Kingdom (37). This study of 18 males and 78 females exploited for commercial sex work found PTSD, severe stress or adjustment disorder, and affective disorders were the most common psychiatric disorders in children and adults. The largest health study of trafficked male survivors is the Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (18). The study, abbreviated STEAM, is the subject of the following section.

The Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region

The present research builds on the STEAM, the first and largest (n = 1,102) cross-sectional health survey of a diverse sample of trafficking survivors exposed to various forms of exploitation, such as sex work, fishing, factory, animal farming or meat packing, and domestic work, among others (18). The STEAM assessed health risks and morbidity patterns as well as various forms of violence, occupational exposures, and living conditions experienced by women, men, and young people (ages 10–17 years) trafficked in Cambodia, Thailand, and Vietnam who were using post-trafficking services at the time the study was conducted.

Prevalence of violence and coercion and mental health outcomes. Almost half of participants experienced physical or sexual violence, or both (48%), which involved severe

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forms of violence, such as being kicked, dragged, beaten up, tied or chained, choked, or burned, among others. For women and children, sexual abuse was more common compared to men (44% among women and 22% among children versus 1.3% among men). In terms of mental health, a more than twofold increase in the odds of PTSD and depression was observed among individuals subjected to more severe forms of violence, compared to trafficked individuals reporting not experiencing violence. More than half of the sample experienced depression (61.2%, 95% CI: 58.2–64.2), but also anxiety (42.8%, 95% CI: 39.8–45.9) and PTSD (38.9%, 95% CI: 36.0–42.0) were elevated. Almost half of all participants (47.1%) reported threats against themselves or their families. Individuals threatened with violence against themselves or their families had more than a twofold increase in PTSD, depression, and anxiety, compared to individuals reporting no threats.

Working and living conditions during trafficking. The STEAM was a pioneering study in that it ascertained information about working and living conditions during trafficking (18). The study reported strong associations between abusive and exploitative working conditions and poor mental health outcomes in the study population. Excessive work hours were associated with a more than threefold increase in the odds (OR) of PTSD and a twofold increase in the odds of anxiety and an elevated level of depression compared to working the standard legal working time. Restricted freedom, being deceived of wages, and poor living conditions (e.g., overcrowding and unsanitary living conditions) were also associated with these mental health outcomes. Working and living conditions differed by trafficking sector, however. For instance, fishermen reported the worst living conditions and had the longest working hours.

The sectors of exploitation examined in the STEAM, including, for example, fishing, construction, and agriculture, involve serious occupational health risks under legal and regulated

working conditions. For trafficked individuals, these risks might be exacerbated by the experience of labor exploitation itself, characterized by poor living conditions, long working hours most of the time without remuneration, fear of being punished or exposure to violent acts, lack of information about the hazards of the job, lack of protective equipment, and the fact that much if not most trafficked labor is unregulated and not inspected (38).

Despite the recognition of forced labor indicators (e.g., abuse of vulnerability, deception, and restriction of movement), even among the larger population of refugees or migrant laborers (including minors) who are not trafficked, scarce epidemiological research has been done to characterize patterns of violence, coercion, and adverse living and working conditions and their association with mental health among trafficked individuals. Few have considered sex differences in patterns of exposure and their consequences for mental health (39-41).

The goal of this dissertation is to address these gaps in knowledge and further previous findings from the STEAM to better understand sex-specific associations between mental health and violence (sexual and physical); coercion (personal and family threats); and working, living, and legal and economic insecurity conditions. Additionally, I sought to better understand the complex patterns of violence and coercion experienced by trafficking survivors. Such information has the potential to amplify our understanding of the magnitude, severity, and nature of this problem and to identify those who may be disproportionately affected by the trafficking experience and exploitative labor practices.

Theoretical Framework

A central aim of the dissertation is to empirically examine human-trafficking-related factors, such as violence and coercion and working, living, and legal and economic insecurity factors during trafficking, and their associations on the mental health of trafficking survivors

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who experienced various forms of exploitation in the Mekong sub-region (Cambodia, Thailand, and Vietnam). The present study uses as conceptual frameworks a human-rights-based approach, the stages of the trafficking process, as well as theories of gender-based violence, interpersonal violence, and trauma. The intersectionality of these frameworks, as briefly discussed in the following sections, provides a grounding for the study of human trafficking.

Human-Rights-Based Approach

Human trafficking is both a cause and a consequence of violations of a person's human rights and her or his entitlement to social justice. Human trafficking is rooted in larger structural issues relating to the global economy, human security, national and international policy, and labor and gender relations, among others (42, 43). A broad range of human rights can be, and are, violated when a person is trafficked, such as the right to personal freedom and security, the right of children to special protection, and the right not to be subjected to torture or cruel, inhuman, or degrading treatment (44). A human-rights-based approach is normatively based on international human rights law and standards, and its focus is the promotion and protection of human rights of the trafficked individual regardless of legal status, nationality, sex, age, race or ethnicity, or other distinctions; thus, it is a relevant framework for human trafficking research as trafficked individuals and their exploitation experience and conditions are also diverse (1). A human-rights-based approach is also relevant for trafficking survivors as assistance to, and protection of, victims is not dependent on criminal proceedings or migration law requirements, which are often complicated and lengthy processes that may not necessarily be favorable for trafficking survivors.

Indeed, human rights instruments, such as the Palermo Protocol Against Transnational Organized Crime, require states to prevent and combat trafficking, protect and assist victims, and

promote cooperation among state parties to confront human slavery (2). In terms of health, the

approach also recognizes that the human right to health means that everyone has the right to the

highest attainable standard of physical and mental health, which includes access to all medical

services, sanitation, adequate food, decent housing, healthy working conditions, and a clean

environment (45). The High Commissioner on Human Rights acknowledges that a human-rights-

based approach is the only way to retain focus on the trafficked person and to prevent the

problem being reduced to simply a migration problem, a public order problem, or an organized

crime problem (44). Therefore, I use this framework as it acknowledges that internationally

recognized human rights provide a universal range of rights that include health rights, freedom of

movement, labor rights, and physical integrity rights (freedom from torture, abuse, and rape)

among others that are especially relevant for the trafficking field as violations are incurred in all

these areas (44). This dissertation examines trafficking conditions that result in human rights

violations as described above; therefore, for trafficking survivors, this approach could be

beneficial for the provision of services and assistance post-trafficking and also to implement

public health measures, policy, and legislation, such as international human rights instruments to

address human trafficking globally.

Stages of the Trafficking Process

The stages of the trafficking process model draws on previous conceptual models of

migration (46, 47) and a current understanding of human trafficking and health (20, 48). The

STEAM, the study from which this dissertation evolved, was implemented based on the stages of

trafficking conceptual model (21) which conceptualizes the trafficking experience and its

consequences as a multi-stage process of cumulative harm (see Figure 1-1). Briefly, the model

depicts a series of event-related stages (recruitment, travel and transit, exploitation, detention, re-

trafficking, integration, and reintegration) that involve different health risks, such as high-risk transportation, poor working conditions, confiscation of documents, and living conditions (21). These risks of trafficking-related exposures through the stages of the trafficking process can have cumulative effects on the physical and mental health of trafficked individuals (21). For instance, a history of deprivation or interpersonal violence may make an individual more vulnerable to recruitment by deceptive offers to migrate for job opportunities. Subsequently, during the travel-transit stage the trafficked individual may be subjected to false imprisonment, violence, and coercion. Then, during the exploitation stage the individual is forced into unlawful labor practices that violate human rights and are harmful to health. The conceptual model of stages of the trafficking process suggests different opportunities to intervene from areas such as the health sector, immigration, law enforcement, labor, or trade.
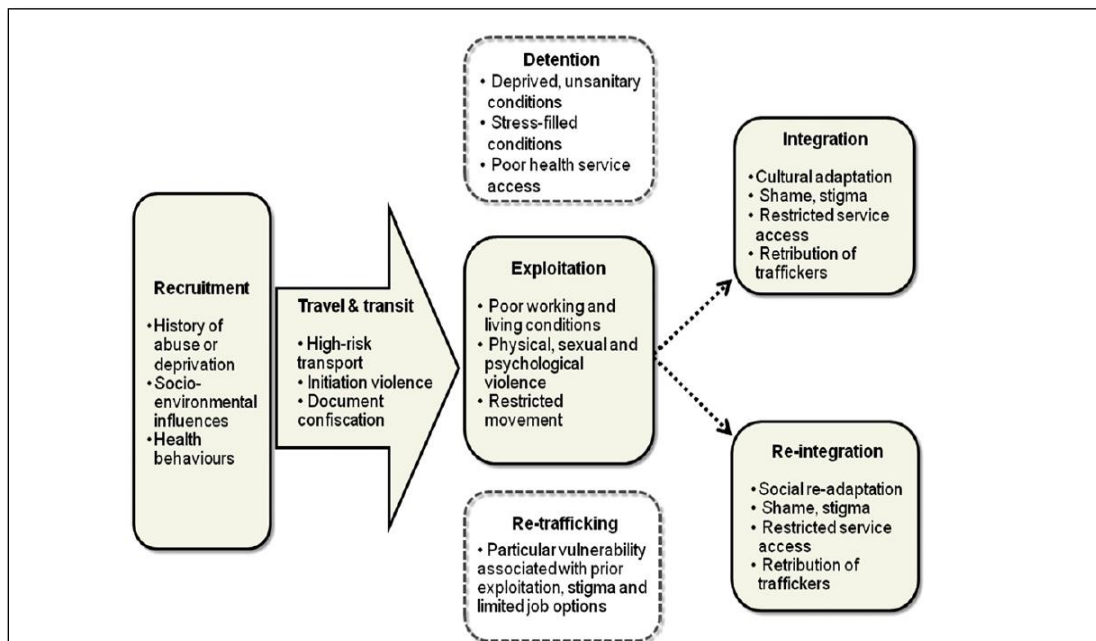
Figure 1-1. Conceptual model: stages of the human trafficking process. Reprinted with permission from reference 21.

In this dissertation, I will focus solely on exposures related to the exploitation stage of this model. The exploitation stage is characterized by a range of physical and emotional abuse,

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exploitation, and violence that are commonly observed in human trafficking cases and are known to have a negative effect on the mental and physical health of trafficking survivors (9, 20, 22, 48, 49). These exposures may include, for example, poor working and living conditions, sexual or physical abuse, coercion and intimidation, and deprivation and confinement, among others (18, 23, 50). Central to this stage are the exertion of sexual or physical violence and coercion in the form of threats, isolation, and exploitative labor circumstances. I focus on the exploitation stage as all of the above exposures can be studied with the STEAM data. It also highlights the traumatic experiences to which trafficked individuals have been subjected and could advance understanding of the mental health of this population. Therefore, I am interested in assessing an array of exposures (e.g., violence and coercion and working, living, and legal and economic insecurity conditions) during the exploitation stage that may be different in females and males. As the experience of trafficking is complex and multidimensional, I examine the conditions that surround the trafficking experience (living, working, and legal and economic insecurity conditions) as other dimensions that are important to consider when evaluating the mental health of female and male trafficking survivors (16).

As highlighted in other work (16), exploitative practices may be organized differently according to the social context (e.g., country, cultural and social norms, legal framework, and labor laws) which is likely to influence the conditions (e.g., working or living conditions) of forced labor. Consequently, living and working conditions during trafficking may according to sex or other factors. For example, sexually exploited Nigerian women appeared to experience fewer physical restrictions, in the sense that they were able to move relatively freely between countries in Europe, as long as they kept paying their debts (51). In contrast, Bulgarian women in the sex sector were found to be under constant surveillance by their traffickers.

Thus, understanding how working, living, and economic insecurity conditions embedded in the trafficking experience affect the mental health of trafficking survivors, along with exposures to violence and coercion, is fundamental to address the health, social, and economic needs of survivors of trafficking. The countries of Cambodia, Thailand, and Vietnam where the present research was conducted are important for human trafficking as these countries have a long history of serving as source, transit and destination of females and males of all ages for sexual and labor exploitation (3, 27).

Gender-Based Violence, Interpersonal Violence, and Trauma Theories

To understand the complex relationships between violence and mental health of trafficked individuals, different theoretical approaches centered on violence and trauma are employed. Rather than utilizing a single theory, I will present the general understanding offered by these theories and the empirical data that support them, as there is not a fully inclusive theory that provides the full complexity and understanding of these phenomena.

Theories of gender-based violence, interpersonal violence, and trauma have been strongly influenced by various fields that include psychology, sociology, criminology, human rights, and the ideological and political agendas of feminist activism. Gender-based violence (GBV) has been defined as "any harmful act that is perpetrated against a person's will, and that is based on socially-ascribed (i.e., gender) differences between males and females" (52). GBV occurs as a result of the normative role expectations associated with each gender, along with the unequal power relationships between genders, within the context of a specific society (53). Thus, GBV theory recognizes that violence is related to gender roles, power relationships, and discrimination (e.g., against women) and that in order to tackle violence we also need to address and understand the societal and relational contexts in which violence occurs (54). Acts of GBV violate a number

of universal human rights protected by international instruments and conventions, such as the right to life; the right to freedom from torture and other cruel, inhumane, or degrading treatment; and the right to personal security (52, 55). Thus, GBV includes acts that "inflict physical, mental, or sexual harm or suffering, threats of such acts, coercion, or other deprivation of liberty" (52, 55). Although the term GBV is most commonly used to refer to violence perpetrated against women and girls, violence can also be committed against boys and men. Interpersonal violence—often termed domestic violence—is part of GBV but involves violent behaviors (physical, sexual, or psychological) committed by a current or former intimate partner or within an intimate relationship (54, 56, 57). I included interpersonal violence as it is not uncommon for trafficked individuals to be recruited by someone known to them, such as a friend of the family, or family members—including husbands or partners and parents (23, 58). As such, GBV and interpersonal violence provide an important structure for the study of human trafficking that involves indiscriminate use of violence, coercion, deception, or debt-bondage, emphasizing the exploitative nature of this enterprise and the use of power and control over the trafficked individual (21, 44).

Consequently, a trauma approach is also relevant for human trafficking as traumatic stressors develop from various forms of violence during the trafficking situation and may lead to mental disorders or various physical symptoms (9). Like torture victims, trafficked individuals are surrounded by their lack of power and control over the situation (e.g., not being able to determine work hours, when and what to eat, whether they can protect themselves by using condoms) which is theorized as being an element of trauma (9, 59). Human trafficking, then, can be seen as a complex traumatic experience that occurs within the context of widespread human rights violations and crime.

In the following paragraphs I briefly review empirical evidence that supports the association of GBV and interpersonal violence with mental health as well as some key points of how trauma is intertwined with these processes.

Research on both gender-based violence and interpersonal violence shows that the severity or chronicity of violence is associated with more depressive symptoms (60–64). Similarly, experiencing more than one type of abuse (e.g., physical, sexual, and psychological or emotional) increases both the probability of having depressive symptoms and the severity of those symptoms (65-67). In particular, the more frequent the psychological abuse, the higher the level of depression experienced (68). Similar to the pattern of depression, experiencing more severe and more sustained abuse results in higher levels of PTSD symptoms, and the risk of experiencing PTSD symptoms rises with the quantity and type of abuse experienced (12, 67, 69). Comorbidity of PTSD and depression is also common; thus, individuals with PTSD are more likely to have high depression scores (12, 66, 70, 71). Various studies have shown a positive association between a history of interpersonal violence and increased levels of anxiety in women (63, 66, 70, 72, 73). Greater severity of anxiety symptoms is reported to be present in abused women when the abuse experienced is more frequent, more intense, and more severe (60, 63, 66).

The literature indicates that gender-based violence and interpersonal violence, particularly among women, is associated with a range of psychological and physical symptoms that have long-lasting effects (57). In general, psychological theories of PTSD and traumatic experiences indicated that PTSD is associated with a wide range of psychological processes including memory, attention, cognitive-affective reactions, beliefs, coping strategies, and social support (74). Some key features of traumatic events include negative valence, lack of

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controllability of the traumatic experience, and the suddenness of the event (59). Moreover, an individual's perception of the controllability of the traumatic event is an important factor in the response to trauma (59). Indeed, unpredictability and uncontrollability are theorized to be predictive of more intense or prolonged psychological reactions to abuse (75).

The negativity of a traumatic event is characterized by either physical pain or an injurious traumatic experience, or the perception that the traumatic event will cause physical pain or injury, emotional pain, or death. The more an individual perceives that she or he has no control over an imminent experience of pain (emotional or physical), injury, or death, the more fearful she or he will be, and extreme fear and feelings of helplessness are the emotional basis for the trauma response (16, 59).

An interesting finding from qualitative studies with East European women was that some women perceived themselves having certain agency and control over the situation despite being trafficked (16). Thus, control, violence, and coercion move along a continuum, where some cases are extreme in the use of violent means while, in others, victims of trafficking may on some level seemingly agree to the exploitation, or at least accept it when faced with few alternatives (58, 76, 77). It is possible that these different experiences or perceptions of trafficking may be associated with different mental health consequences.

Finally, in terms of the suddenness of an event, events that involve imminent threat of harm are more likely to cause overwhelming fear than experiences involving danger that is not imminent (59). These three key features of a traumatic experience event are necessary, although not always sufficient, for an event to be traumatic, and all three are mediated by the individual's perceptions and subjective understanding of the event (59).

The interconnection of the conceptual and theoretical approaches mentioned above provide a framework to study the phenomenon of human trafficking from different lenses, encompassing the individual but also, more broadly, the conditions that characterized the trafficking experience (working, living, and legal and economic insecurity).

Research Aims

To my knowledge, there is scarce research that characterizes the multidimensional experience of being trafficked. Therefore, this dissertation seeks to examine if violence, coercion, and conditions embedded in the trafficking experience (working, living, and legal and economic insecurity) represent important dimensions of mental health risks for survivors of trafficking.

The specific aims of this dissertation are as follows.

Aim 1

Aim 1 is to assess the association of violence (sexual, physical, or both) and coercion (personal and family threats) with mental health symptoms (anxiety, depression, and PTSD) in female and male trafficking survivors.

Hypothesis 1a: Violence and coercion will be associated with poor mental health symptoms.

Hypothesis 1b: Types of violence and coercion will differ by sex.

Aim 2

Aim 2 is to assess the association of living and working conditions and legal and economic insecurity with mental health symptoms (anxiety, depression, and PTSD) in female and male trafficking survivors.

Hypothesis 1a: Living, working, and legal and economic insecurity conditions will be associated with poor mental health symptoms

Hypothesis 2b: Living, working, and legal and economic insecurity conditions will differ by sex.

Aim 3

Aim 3 is to identify patterns of violence (sexual and physical violence, or both) and coercion (personal and family threats) of female and male trafficking survivors using a latent class analysis approach and the association of the emergent latent classes to mental health symptoms (anxiety, depression, and PTSD).

Hypothesis 3a: Severe patterns of violence and coercion will be associated with poor mental health symptoms in females and males.

Given the paucity of evidence on mental health and human trafficking for different forms of labor and among diverse populations, findings from this research will further knowledge of the health effects of human trafficking. It will also help to inform stakeholders and health care and legal professionals developing post-trafficking responses, assistance, and services. Ultimately, this knowledge could have important implications for influencing decisions about resource allocation policy and practice in relation to human trafficking and mental health.

Summary of the Dissertation

Chapter 2 examines the cross-sectional relationships between violence, threats, or coercion and mental health outcomes (anxiety, PTSD, and depression) in females and males. Chapter 3 evaluates the relationship between living, working, and legal and economic insecurity and mental health by sex. Chapter 4 assesses the patterns of violence and coercion in females and males using latent class analysis and the association of the identified latent classes to mental health outcomes (anxiety, PTSD, and depression). Chapter 5 presents the integration and discussion of findings in the context of potential public health implications, implementation of policies, and directions for future research.

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Chapter 2

Mental Health, Violence, and Psychological Coercion (Aim 1)

Introduction

Human trafficking is a pervasive global crime. The United Nations defines human trafficking as the "act of recruiting, transporting, transferring, harboring or receiving a person; by means such as force, abduction, fraud, coercion or abuse of vulnerability; for the purpose of forced labor or sexual exploitation" (1).

Violence (sexual, psychological, or physical) inflicted during trafficking can vary depending on the trafficking sector and may involve different dynamics of power and control over trafficked individuals (2). Specific patterns of violence and coercion might also differ among females and males (3-5). However, a wide knowledge gap persists in our understanding of the effects of violence and coercion on the mental health of survivors of trafficking. To date, there is limited sex-disaggregated evidence on the mental health impact of human trafficking for different forms of labor exploitation or among culturally diverse populations of females and males (including adults, adolescents, and children).

The International Labour Organization (ILO) indicates that, globally, 40.3 million women, men, and children are in modern slavery situations as a result of debt bondage, trafficking, or other forms of slavery (6). Of these, 28.7 million or 71% of the global total, are women and girls and 11.6 million, or 28.9%, are men and boys. Of the global total, 24.9 million (57.6% of males and 42.4% females) are forced laborers working in economic sectors, such as

agriculture, construction, domestic work, manufacturing, and fishing, and 15.4 million people

live in forced marriage arrangements (6). In addition, approximately 3.8 million adults and 1.0

million children, mainly females, are exploited for commercial sex.

In sum, approximately six adults out of every 1,000 adults and five children for every

1,000 children worldwide are in forced labor conditions at any given point in time. Moreover,

these estimates are conservative, according to the ILO, due to methodological and data

limitations (6).

Forced labor is highly profitable. The ILO estimates that forced labor generates US$150

billion in illegal profits per year (7). The Asia Pacific region accounts for the largest absolute

number of forced laborers by far, with 62% of the global total and where four out of every 1,000

people suffer from labor exploitation (6). This region also has the second highest prevalence of

forced marriages after Africa (6).

Forced labor affects females and males, including children and adolescents, in various

sectors of exploitation. However, most of the research on human trafficking has been centered on

sex-trafficking and females while other forms of forced labor and trafficking of males have been

largely ignored. This in turn has led to a gross underestimate of the problem in most locations (8-

10).

Scholars and experts have argued that "exploitation" is at the core of the definition of

human trafficking and that "coercion" is a key feature (5, 11-14). Violence (physical, sexual, or

both) and psychological abuse or coercion (threats or deception) are interconnected and can be

sources of traumatic and chronic stressors (12, 15, 16). Research on prisoners of war, torture

survivors, survivors of concentration camps, cult members, victims of domestic violence, and

trafficked individuals report similar experiences of violence and threats and corresponding

psychological consequences (12, 15, 17-23). In these relationships, perpetrators exert high levels of power and control over victims' social, physical, psychological, sexual or economic milieu, using systematic organized techniques of disempowerment and disconnection (5, 11, 12). Life circumstances with low levels of power and control, as one would expect from a trafficked situation, are associated with higher levels of physical, psychological, and sexual violence (15, 24). Deprived living conditions with profound restrictions on basic human needs (e.g., food, water, and shelter) during trafficking, and the fact that enslaved individuals are unable to predict or control any aspect of their torturous experience, make trafficked individuals more susceptible to chronic disease and mental illness (5, 25-29).

Studies on human trafficking in females that used screening instruments to assess mental health (30-32) have reported very high prevalence of anxiety (48.0%–97.7%), depression (52.0%–100%), and post-traumatic stress disorder (PTSD, 19.5%–77.0%). Three studies that used diagnostic instruments to assess mental disorders (33-35) have reported lower prevalence of anxiety (6.0%–18%), depression (13.0%–32.0%), and PTSD (16.0%–48.3%).

Only three studies have evaluated the mental health of trafficked males (28, 34, 36). These studies used mental health screening instruments. Two of these studies (29, 35) reported high symptom levels of anxiety (21.7%–48.3%), depression (20.8%–60.6%), and PTSD (15.8%–46.2%). One (28) compared symptom associations with different levels of violence while another (36) reported only descriptive results of 27 males. The third study included only 18 trafficked men who were in contact with secondary mental health services (34).

To date, studies conducted with trafficked females and males suggest that there are sex-related differences in survivors' mental health, with a higher prevalence of anxiety, depression, and PTSD in females versus males. Regardless of the assessment approach (screening or

diagnostic instruments) used in previous research of survivors of trafficking, the mental health prevalence of these psychological disorders is elevated and similar (in the range of 20% or above) to those observed among war-refugees and torture survivors (37-39).

The Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM) is a pioneering study as the first and largest health survey of trafficking survivors exploited in various labor sectors among a diverse Southeast Asian population of females and males, including children and adolescents (28). The present study builds on earlier findings from the STEAM. First, I examine how patterns of violence (sexual, physical, or both) and psychological coercion (personal and family threats) differ by sex; second, I assess how types of violence and coercion are associated with anxiety, depression, and PTSD in females and in males. To my knowledge, no studies to date have assessed the sex-specific associations between types of violence or psychological coercion and the risk of mental illness in survivors of trafficking.

Modern slavery, human trafficking, forced labor, and human exploitation are terms often used interchangeably (40), as I will do in this paper, while recognizing that these constructs can often have distinct sociopolitical, legal, and historical connotations (10, 13, 41).

Methods

Data Source, Study Design, and Study Sample

This study is a cross-sectional secondary analysis using data from the STEAM. The study methodology has been published elsewhere (28). Briefly, the STEAM interviewed 1,102 participants. I excluded 87 people who did not reach the destination country of exploitation. The study included 1,015 survivors: trafficked males, females, youth, and children (aged 10–17

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years) who reached the country of exploitation and attended post-trafficking assistance services in Cambodia, Thailand, and Vietnam.

Sample Design

A two-stage sampling strategy was used to identify individuals using post-trafficking services. First, 15 post-trafficking support services were selected across the three countries (6 services in Cambodia, 4 in Thailand, and 5 in Vietnam) based on diversity of clientele (e.g., age, sex, sector of exploitation, and country of origin), service relationship with the International Office of Migration (IOM) country teams, and agreements with government agencies (e.g., support, referral, and service arrangements). The STEAM describes individuals who received post-trafficking services, regardless of differing legal definitions of trafficking and service eligibility criteria between countries (28).

Second, a consecutive sample of individuals were invited to participate in a structured interview within 2 weeks of admission to the post-trafficking services between October 2011 and May 2013. Participants were recruited only if the locally trained caseworker or social worker determined that their participation would not cause harm to their well-being. Individuals in the sample were identified as trafficked by the local governmental and non-governmental referral networks and post-trafficking service providers. The response rate for the baseline survey was 98%.

Data Collection

Interviews were conducted by caseworkers or social workers from the agencies providing post-trafficking services. Interviewers received an intense one-week training provided by one of the principal investigators of the STEAM (LK) in collaboration with the IOM partners in each

country. Data collection and double data entry were coordinated by IOM country offices, with oversight by the London School of Hygiene and Tropical Medicine (LSHTM).

Development of Survey Questionnaire and Application

The survey questionnaire was based on the instrument used in a previous European study on health and sex trafficking (27). The survey was adapted by the study team for the different study populations (various labor forms of exploitation) and the regions. The interviewers (social workers in post-trafficking services) also participated in adapting the questionnaire, which was pilot tested in the study settings before the survey. The questionnaire asked survivors of trafficking about socioeconomic background, pre-trafficking and post-trafficking exposures, living and working conditions during trafficking, violence and coercive factors, mental and physical health outcomes, and future plans and concerns. The instrument was translated into Khmer, Thai, Vietnamese, and Lao in multiple steps: professional translation from English to other languages, group translation-discussion processes with IOM counter-trafficking teams, pilot-testing, and review after back-translation into English.

Ethics

A strict ethical and safety protocol was implemented based on the *World Health Organization (WHO) Ethical and Safety Recommendations for Interviewing Trafficked Women* (42). Ethical approval for the study was granted by the LSHTM and by the National Ethics Committee for Health Research in Cambodia, the Hanoi School of Public Health in Vietnam, and the Ministry of Social Development and Human Security in Thailand. Core ethical guidance included measures to ensure that participation was voluntary and confidential, assurance that declining participation would not affect the provision of support services, avoidance and

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management of distress, and offer of options for supported referral for health or other problems. The secondary analysis was approved by the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board, eResearch ID: HUM00097096.

Specific Measures

Anxiety, depression, and post-traumatic stress disorder symptoms measures. Anxiety and depression symptoms in the past week were measured by the Hopkins Symptom Checklist-25, a symptom inventory which measures symptoms of anxiety and depression (43). It consists of 25 items: 10 items for anxiety symptoms and 15 items for depression symptoms. The scale for each question includes four categories of response ("Not at all," "A little," "Quite a bit," and "Extremely," rated 1 to 4, respectively). Two scores were calculated: The anxiety score was the average of all 10 items, while the depression score was the average of the 15 depression items. The depression score was correlated with major depression as defined by the *Diagnostic and Statistical Manual of the American Psychiatric Association,* 4th edition (*DSM-IV*) in several populations (44). A cutoff of 1.625 was used to identify symptoms of depression, as item 12 in the questionnaire (sexual interest) was excluded given the nature of the study population (28). For anxiety, a cutoff of 1.75 determined symptoms of anxiety, which was based on previous research on individuals using post-trafficking services and on studies of Cambodian, Laotian, and Vietnamese refugees in whom this instrument has been validated (31, 36, 45, 46).

PTSD symptoms in the past week were measured using the Harvard Trauma Questionnaire (HTQ) part IV, which includes 27 trauma symptoms (47). The first 16 items were derived from the *DSM-IV* criteria for PTSD and assessed the presence of the main PTSD symptom clusters: intrusive experiencing, avoidance behaviors, hypervigilance, and emotional numbing (44). The remaining items were developed by the Harvard Program in Refugee Trauma

to describe PTSD symptoms related specifically to refugee trauma. These symptom items focus on the impact that the traumatic experiences may have had on the subject's perception of his or her daily life (e.g., having difficulty dealing with new situations). These symptoms are important because traumatized people are initially more concerned about their social functioning in terms of survival and self-protection after the traumatic experience than about coping with their emotional distress (47-49). Each question has four response categories: "Not at all," "A little," "Quite a bit," and "Extremely," rated 1 to 4, respectively. A total score was calculated by averaging the 27 items. A cutoff of 2.0 was used to assess symptoms of PTSD based on previous research on trafficked individuals accessing post-trafficking services (30, 32). Although the HTQ has not been validated with the study population, it has been used in cross-cultural settings and among Southeast Asian populations (e.g., Cambodians) exposed to trauma (46, 50, 51). This instrument has shown high sensitivity for identifying persons with PTSD when diagnosed by experienced psychiatrists in a clinical setting and according to *DSM* criteria (46). The HTQ has high reliability (52) and internal consistency (52, 53) and test-retest reliability ranging from 0.89 to 0.92 (53, 54).

Violence and coercion measures. To assess physical and sexual violence, standardized and validated questions from the World Health Organization (WHO) International Study on Women's Health and Domestic Violence were used (9). These questions were not validated in the study population but describe acts of physical and sexual violence commonly reported by trafficked individuals in post-trafficking services and shelters (12, 28, 30, 36). As examples, they include being kicked, dragged, beaten up, tied or chained, choked, or burned; having a dog released to bite or scratch; being threatened with a weapon, cut with a knife, shot, slapped, pushed, or hit; and forced to have sex. For this analysis, violence was categorized for females as

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no violence, physical violence only, sexual violence only, and physical and sexual violence. For males, violence was measured with the variable "physical violence with threats made with a gun, knife, or other weapon" and only six males reported.

Two additional questions were used to assess emotional or psychological abuse during the trafficked period: (a) "While you were in this situation, did anyone threaten to hurt you?" (yes or no) and (b) "During this time did anyone threaten to hurt your family or someone you care about?" (yes or no). These questions assess threats commonly made by traffickers that are considered hallmarks of the trafficking experience and are frequently used in studies of interpersonal violence (11, 27, 28, 55).

Covariates. Covariates in this analysis were theory-driven and based on prior analyses of the STEAM (5, 28, 32, 56). Age (10–17, 18–25, and 26 or above), country of exploitation and trafficking (Thailand, China, or Other [Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia]), and time in trafficking in months (1–12 and 13 or more). Participants were asked which exploitative sector they were in most recently. Sectors of exploitation were defined as sex work, forced marriage, entertainment, and dancing; domestic work, cleaning, restaurant work, and begging; construction and factory work; and livestock, meat packing and preparation, agriculture, and fishing. Sectors were assessed in males and females. I collapsed two sectors of exploitation in males to be able to make meaningful comparisons since there were few individuals in those sectors (see Table 2-1). Moreover, previous research indicates that some of these sectors of exploitation might share similar levels of violence (28, 32, 57).

Statistical analysis. I calculated frequencies and conducted bivariate analyses with cross tabulations using Rao-Scott chi-square tests to account for the clustered structure of the data and assess associations between violence and threats and covariates with anxiety, depression, and

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PTSD status (58). All analyses were stratified by sex because of the different distribution of violence and trafficking-related exposures for females and males. Sex-specific unadjusted and adjusted modified Poisson regression models were conducted to estimate prevalence ratios (PRs) and their 95% confidence intervals (CIs) for the association between violence and threats with anxiety, depression, and PTSD) (59).

Generalized estimation equations (GEEs) with an extension of the sandwich variance estimator were used to calculate a robust variance estimation that considers the level of correlation of observations within a cluster and produces standard errors of the estimates accordingly (60). This statistical approach was chosen because it is considered to be a direct and less-biased approach to estimating the PRs, it corrects standard errors, it considers clustered data (59, 61, 62), and it is robust to the specification of the working correlation structure chosen (63).

To determine the best fit of the model and the working correlation structure, I used the quasi-likelihood under the independence model criterion (QIC) statistic, which is robust to the selection of correlation structure (64). I chose an exchangeable correlation structure that assumes that all pairs of observations are correlated within a cluster. I fit separate and sex-specific binary modified Poisson regression models for each of the outcome variables (anxiety, depression, and PTSD). Adjusted models included one model with the previously specified demographic covariates, one model for violence, and one model for threats accounting for covariates.

All analyses were two-tailed and performed using SAS version 9.4 (SAS Institute, Inc., Cary, NC). PROC SURVEYFREQ with a cluster and *chisq* statement were used for the descriptive analysis. PROC GENMOD was used with the robust variance estimator provided by the REPEATED statement with a cluster identifier that uses the method of generalized

estimating equations to estimate the model and give a proper estimate of the standard error of the PRs while accounting for clustering in the data.

Results

Sample Characteristics of Females and Males

Table 2-1 presents descriptive characteristics of the study population stratified by sex. A total of 569 (56.1%) females and 446 (43.9%) males participated in the survey.

Almost half of the females were children and adolescents (< 18 years of age, 49.4%), and came from Vietnam (41.8%) and various other countries (49.6%). Males were mainly 18–25 years old (45.1%), or older than 25 years old (40.8%) and most frequently were from Cambodia (57.6%). More than half of the population of females was exploited in Thailand (54.1%) and China (39.2%). In contrast, 31.4% of males were trafficked in Thailand, 24.0% were trafficked in China and the rest in several different countries (44.6%) that included Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia.

Table 2-1 Sociodemographic characteristics of trafficking survivors by sex: The Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM), n = 1,105

	Females n (%)	Males n (%)
Total	569 (56.1)	446 (43.9)
Age		
10–17	281 (49.4)	63 (14.1)
18–25	197 (34.6)	201 (45.1)
26 or above	91 (16.0)	182 (40.8)
Country of origin		
Cambodia	49 (8.6)	257 (57.6)
Vietnam	238 (41.8)	106 (23.8)
Other[a]	282 (49.6)	83 (18.6)
Country of exploitation		
China	223 (39.2)	107 (24.0)

	Females n (%)	Males n (%)
Thailand	308 (54.1)	140 (31.4)
Other[b]	38 (6.7)	199 (44.6)
Sector of exploitation		
Sex work, forced marriage, entertainment, and dancing[c]	410 (72.1)	46(10.3)
Domestic work, cleaning, restaurant work, begging, and other	66 (11.6)	
Construction and factory work	54 (9.5)	101 (22.7)
Livestock, agriculture, fishing	39 (6.9)	299 (67.0)
Time in trafficking situation (months)[d]		
1–12	78 (14.5)	24 (5.7)
13 or more	460 (85.5)	401 (94.4)
Violence during trafficking[e]		
No violence	295 (52.1)	219 (49.3)
Physical violence	73 (12.9)	218 (49.2)
Sexual violence	89 (15.7)	0 (0)
Both physical and sexual violence	109 (19.3)	6 (1.4)
Receiving threats during trafficking		
None	345 (60.6)	192 (43.1)
Personal threats	141 (24.8)	206 (46.2)
Both, personal and family threats	83 (14.6)	48 (10.8)
Physical violence with threats made with a gun, knife, or other weapon during trafficking[f]		
Yes	182 (32.2)	225 (50.5)
No	384 (67.8)	221 (49.6)

[a] Other country: Cambodia, Laos, Burma, Thailand, and Vietnam.
[b] Other country: Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia.
[c] 43.9% and 25.8% of females in this sector of exploitation were exploited in Thailand and China, respectively.
[d] 31 females and 21 males missing.
[e] 3 females and 3 males missing.
[f] 3 females missing.

Most of the females were primarily trafficked for sex work, forced marriage, entertainment, and dancing (72.1%) in Thailand (43.9%) and China (25.8%). In contrast, males were exploited mainly in sectors related to livestock (including meat preparation), agriculture, and fishing (67.0%) and construction and factory work (23.0%) in Thailand and various other countries (Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia). The

vast majority of individuals were trafficked for more than one year irrespective of sex: females 85.5% and males 94.4%.

Overall, males reported more episodes of physical violence only (49.2%) while for females, violence involved physical (12.9%) and sexual violence (15.7%) alone, and both physical and sexual violence (19.3%). Approximately half of the participants, 52.1% of females and 49.3% of males, reported no experience of violence. Receiving personal threats was almost twice as common for males (46.2%) as for females (24.8%). In contrast, experiencing both personal and family threats was slightly more common in females (14.6%) than in males (10.8%). Half of the males (50.5%) and a third of females (32.2%) were subjected to physically violent acts that involved threats made with a gun, knife, or other weapon.

Table 2-2 presents information on the prevalence of anxiety, depression, and PTSD for females and males. The prevalence of depression was higher in women but present in more than half of the study population: 64.3% of females and 57.3% of males. PTSD was reported in almost half of the males (41.8%) while it was slightly lower for females (34.5%). Anxiety was similarly prevalent in both females (40.5%) and males (45.8%).

Table 2-2 Prevalence of mental health of trafficking survivors, females and males, n = 1,105

	Females n (%)	Males n (%)
Anxiety		
Yes	230 (40.5)	204 (45.8)
No	338 (59.5)	241 (54.2)
Depression		
Yes	365 (64.3)	255 (57.3)
No	203 (35.7)	190 (42.7)
Post-traumatic stress disorder (PTSD)		
Yes	196 (34.5)	186 (41.8)
No	372 (65.5)	259 (58.2)

[a] 1 female & 1 male missing for anxiety, depression, and PTSD.

In the study population, 27.4% of females and 32.1% of males screened positive for all three mental health symptoms (anxiety, PTSD, and depression). Only 18 (3.2%) females and 29 (6.5%) males had anxiety, PTSD, or both, and did not have depression.

Modified Poisson Regression Models in Females

Crude prevalence ratios of demographic characteristics and anxiety, PTSD, and depression. Results from the crude modified Poisson regression models for demographic characteristics for females and anxiety, PTSD, and depression are presented in Table 2-3.

Compared to children and adolescents (10–17 years old), the prevalence for anxiety in younger females (18–25 years old) was 26% (PR = 1.26; 95% CI: 1.12–1.42) higher, while for young and older adults the prevalence of PTSD and depression was slightly elevated but was not statistically associated.

Females exploited in other countries (not China) had a 76% (PR = 1.76; 95% CI: 1.14–2.73) higher prevalence of anxiety compared to females trafficked in Thailand. While China and other countries had a more than 50% higher prevalence of PTSD, the result was not statistically significant. In contrast, females exploited in China had a 15% higher prevalence (PR = 1.15; 95% CI: 1.01–1.32) for depression compared to females trafficked in Thailand.

Table 2-3 Crude prevalence ratios of demographic characteristics and anxiety, post-traumatic stress disorder, and depression in trafficked females, n = 569

	Anxiety		PTSD[a]		Depression	
	PR[b]	95% CI[c]	PR	95% CI	PR	95% CI
Age						
10–17 (referent)	1.0		1.0		1.0	
18–25	1.26	1.12-1.42***	1.12	0.96-1.30	1.09	0.97-1.22
26 or above	1.26	0.93-1.70	1.15	0.86-1.53	1.02	0.85-1.24
Country of exploitation						
Thailand (referent)	1.0		1.0		1.0	

	Anxiety		PTSD[a]		Depression	
	PR[b]	95% CI[c]	PR	95% CI	PR	95% CI
China	1.34	0.87-2.07	1.57	0.81-3.01	1.15	1.01-1.32*
Other[d]	1.76	1.14-2.73**	1.80	0.89-3.63	1.05	0.56-1.94
Sector of exploitation						
Sex work, forced marriage, entertainment, dancing (referent)	1.0		1.0		1.0	
Domestic work, cleaner, restaurant work, begging, and other	1.34	1.06-1.70**	1.49	1.05-2.11*	1.12	0.89-1.42
Construction and factory work	1.50	1.12-2.03**	1.47	1.05-2.05*	1.12	0.78-1.60
Livestock, agriculture, and fishing	1.17	0.81-1.69	1.07	0.91-1.26	0.88	0.65-1.19
Time in trafficking situation (months)						
1–12 (referent)	1.0		1.0		1.0	
13 or more	1.05	0.63-1.74	1.38	0.87-2.20	1.22	0.84-1.77

[a] PTSD: Posttraumatic stress disorder.
[b] PR: Prevalence ratio.
[c] 95% Confidence interval.
[d] Other country of exploitation included: Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia.
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

Compared to sex work, forced marriage, entertainment, and dancing, women and girls working in domestic work, cleaning, restaurant work, begging, and other; construction and factory work; and livestock, agriculture, and fishing had a significantly higher prevalence of anxiety and PTSD. The domestic work, cleaning, restaurant work, begging, and other had a 34% (PR = 1.34; 95% CI: 1.06–1.70) higher prevalence of anxiety and almost a 50% elevated prevalence of PTSD (PR = 1.49; 95% CI: 1.05–2.11). Construction and factory work had a 50% (PR = 1.50; 95% CI: 1.12–2.03) greater prevalence for anxiety and a 47% elevated prevalence for PTSD (PR = 1.47; 95% CI: 1.05–2.05), while the prevalence for the three mental health

outcomes and livestock, agriculture, and fishing did not differ significantly. Similarly, the

prevalence of depression and sector of exploitation were not significantly associated.

Females trafficked for 13 or more months had a slightly elevated prevalence of PTSD and

depression, 38% (PR = 1.38; 95% CI: 0.87–2.20) and 22% (PR = 1.22; 95% CI: 0.84–1.77),

respectively, but they were not statistically significant.

Crude and adjusted prevalence ratios of the association of violence including threats and

anxiety, PTSD, and depression in trafficked females. Table 2-4 shows the results from the crude

and adjusted models for violence, threats, and mental health outcomes in females. Multivariable

models were adjusted for age, country of exploitation, sector of exploitation, and time in

trafficking.

Table 2-4 Adjusted prevalence ratios of the association of violence including threats and anxiety,
post-traumatic stress disorder, and depression in trafficked females, n = 569

	Unadjusted model		Adjusted Model 1[a]		Adjusted Model 2[b]	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI
Anxiety						
Violence						
No violence (referent)	1.0		1.0			
Physical violence	1.31	1.06-1.62**	1.18	0.93-1.49		
Sexual violence	0.90	0.59-1.39	0.94	0.48-1.83		
Both, physical and sexual violence	1.68	1.37-2.07***	2.08	1.64-2.64***		
Receiving threats during trafficking						
None (referent)	1.0				1.0	
Personal threats	1.93	1.54-2.41***			1.93	1.55-2.42***

	Unadjusted model		Adjusted Model 1[a]		Adjusted Model 2[b]	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI
Both, personal and family threats	2.10	1.58-2.79***			2.11	1.57-2.83***
Post-Traumatic Stress Disorder						
Violence						
No violence (referent)	1.0		1.0			
Physical violence	1.32	1.16-1.50***	1.15	0.89-1.48		
Sexual violence	0.80	0.60-1.07	0.84	0.52-1.34		
Physical and sexual violence	1.33	1.18-1.51***	1.55	1.37-1.74***		
Receiving threats during trafficking						
None (referent)	1.0				1.0	
Personal threats	1.49	1.16-1.92***			1.44	1.06-1.96*
Both, personal and family threats	1.95	1.35-2.82***			1.96	1.32-2.91***
Depression						
Violence						
No violence (referent)	1.0		1.0			
Physical violence	1.17	0.97-1.40	1.12	0.96-1.32		
Sexual violence	0.96	0.79-1.16	1.02	0.85-1.22		
Both, physical and sexual violence	1.44	1.23-1.68***	1.57	1.33-1.85***		
Receiving threats during trafficking						
None (referent)	1.0				1.0	

	Unadjusted model		Adjusted Model 1[a]		Adjusted Model 2[b]	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI
Personal threats	1.46	1.18-1.81***			1.46	1.20-1.78***
Both, personal and family threats	1.51	1.21-1.87***			1.42	1.25-1.63***

Note: Models for anxiety, depression, and Post-traumatic Stress Disorder symptoms were ran separately but they were adjusted for the same variables.

[a] Adjusted Model 1: age, country of exploitation, sector of exploitation, time in trafficking.

[b] Adjusted Model 2: age, country of exploitation, sector of exploitation, time in trafficking.

[c] PR: Prevalence ratio.

[d] 95% Confidence interval.

$* \, p \leq 0.05$

$** \, p \leq 0.01$

$*** \, p \leq 0.001$

Anxiety in females. Females exposed to both physical and sexual violence had a 68%

greater prevalence of anxiety (PR = 1.68; 95% CI: 1.37–2.07) compared to those without

violence. After adjustment, the prevalence was elevated such that exposed individuals had a

twofold higher (PR = 2.08; 95% CI: 1.64–2.64) prevalence of anxiety among those exposed to

both physical and sexual violence. Women and girls who suffered from physical violence alone

had a 30% elevated prevalence of anxiety (PR = 1.31; 95% CI: 1.06–1.62) compared to females

without violence; however, after adjustment, the estimate was reduced and did not differ

significantly. Sexual violence alone was not statistically associated with anxiety in the crude and

adjusted models.

Females who received personal threats during trafficking had an 93% (PR = 1.93; 95%

CI: 1.55–2.42) increase in the prevalence of anxiety compared to those without threats, while the

prevalence of anxiety more than doubled among those threatened with both personal and family

threats (PR = 2.11; 95% CI: 1.57–2.83) after controlling for covariates.

Results from the models adjusted for violence (Model 1) and threats (Model 2) and other

covariates (age, country of exploitation, sector of exploitation, and time in trafficking) are

described in the following paragraph. When compared to sex work, forced marriage,

entertainment, and dancing, the model adjusted for violence showed more than a 50% elevated prevalence of anxiety (PR = 1.62; 95% CI: 1.28–2.05) for domestic work, cleaning, restaurant work, begging, and other; construction and factory work (PR = 1.79; CI: 1.04–3.06); and livestock, agriculture, and fishing (PR = 1.51; CI: 1.14–1.98). Likewise, the model adjusted for threats showed more than a 40% higher prevalence for anxiety among the sectors of domestic work, cleaning, restaurant work, begging, and other (PR = 1.41; 95% CI: 1.16–1.72); and livestock, agriculture, and fishing (PR = 1.47; 95% CI: 1.18–1.82). Data not shown in table.

PTSD in females. Women and girls exposed to physical violence only as well as both physical and sexual violence had more than a 30% elevated prevalence of PTSD. After adjustment, only females exposed to both physical and sexual violence had almost a 50% higher prevalence for PTSD (PR = 1.55; 95% CI: 1.37–1.74) compared to those without violence. The prevalence of physical violence alone was slightly lower while the prevalence for sexual violence alone remained fairly similar to the crude analysis. Neither form of violence alone (physical or sexual) was statistically associated with PTSD after adjustment.

Women and girls who experienced personal threats had a 49% (PR = 1.49; 95% CI: 1.16–1.92) elevated prevalence of PTSD while for those who received both personal and family threats the prevalence for PTSD almost doubled (PR = 1.95; 95% CI: 1.35–2.82) compared to females without threats in the crude model. After adjustment, the prevalence ratio for personal threats was slightly reduced and remained statistically significant (PR = 1.44; 95% CI: 1.06–1.96), while for females exposed to both personal and family threats the prevalence of PTSD almost doubled and remained fairly similar to the crude level (PR = 1.96; 95% CI: 1.32–2.91).

The model adjusted for threats and other covariates indicated that, compared to sex work, forced marriage, entertainment, and dancing, there was more than a 60% higher prevalence for

PTSD for domestic work, cleaning, restaurant work, begging, and other (PR = 1.66; 95% CI: 1.09–2.54). Females exploited in livestock, agriculture, and fishing had a 40% increase in the prevalence of PTSD (PR = 1.45; 95% CI: 1.00–2.12). Data not shown in table.

Depression in females. After adjustment the prevalence for depression was elevated. Females who suffered from both physical and sexual violence had a 57% (PR = 1.57; 95% CI: 1.33–1.85) higher prevalence for depression when compared to those without violence. Physical and sexual violence alone were not statistically associated with depression in crude and adjusted analysis. However, experiencing threats remained significantly associated after adjustment. Females who experienced personal threats had a 46% (PR = 1.46; 95% CI: 1.20–1.78) elevated prevalence for depression after adjustment. Similarly, after adjustment of covariates, women and girls with both personal and family threats had a 42% (PR = 1.42; 95% CI: 1.25–1.63) higher prevalence of symptoms of depression when compared to females without threats.

Modified Poisson Regression Models in Males

Crude prevalence ratios of demographic characteristics and anxiety, PTSD, and depression in males. Table 2-5 shows the results from the crude modified Poisson regression models for demographic characteristics for males and anxiety, PTSD, and depression.

Age was not significantly associated with anxiety and PTSD. However, compared to children and adolescents, older adults (PR = 1.43; 95% CI: 1.08-1.90) had a 43% increase in the prevalence of depression. Males exploited in China and other countries had a threefold (PR = 3.63; 95% CI: 2.58-5.12) and a twofold (PR = 2.89; 95% CI: 2.04-4.11) higher prevalence of PTSD, respectively, compared to those trafficked in Thailand.

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The prevalence of anxiety among men and boys trafficked for 13 or more months more than doubled compared to those trafficked for 1-12 months (PR = 2.31; 95% CI: 1.28-4.16). However, length of time in trafficking was not statistically associated with PTSD and depression.

Crude and adjusted prevalence ratios of violence, threats, and anxiety. Results for the crude and adjusted modified Poisson models for violence, threats and anxiety, PTSD, and depression in males are presented in Table 2-6. Multivariable models were adjusted for age, country of exploitation, sector of exploitation, and time in trafficking.

Table 2-5 Crude prevalence ratios of demographic characteristics and anxiety, post-traumatic stress disorder, and depression in trafficked males, n = 446

	Anxiety		PTSD[a]		Depression	
	PR[b]	95% CI[c]	PR	95% CI	PR	95% CI
Age						
10–17 (referent)	1.0		1.0		1.0	
18–25	1.14	0.64-2.06	1.79	0.76-4.20	1.41	0.95-2.09
26 or above	1.06	0.64-1.76	1.64	0.91-2.96	1.43	1.08-1.90**
Country of exploitation						
Thailand (referent)	1.0		1.0		1.0	
China	1.33	0.68-2.59	3.63	2.58-5.12***	1.60	0.91-2.82
Other	0.92	0.70-1.22	2.89	2.04-4.11***	0.95	0.84-1.08
Sector of exploitation						
Forced marriage, entertainment, dancing, domestic work, cleaner, restaurant work, begging, and other (referent)	1.0		1.0		1.0	
Animal, farming, agriculture, and fishing	1.03	0.58-1.81	1.23	0.64-2.34	1.37	0.81-2.32
Construction and factory work	1.40	0.76-2.57	1.27	0.85-1.89	1.34	0.94-1.91
Time in trafficking situation (months)						
1–12 (referent)	1.0		1.0		1.0	
13 or more	2.31	1.28-4.16**	1.22	0.48-3.11	1.02	0.60-1.74

[a] PTSD: Post-traumatic stress disorder.

Anxiety in males. The prevalence of anxiety decreased slightly and did not differ after adjustment among those who suffered from physical violence with threats made with a gun, knife, or other weapon compared to those without violence. In contrast, the prevalence of anxiety among males was more than 30% (PR = 1.33; 95% CI: 1.08–1.64) and almost 70% (PR = 1.68; 95% CI: 1.43–1.97) higher among those who experienced personal threats and those who had experienced both personal and family threats, respectively, compared to those who had not.

Table 2-6 Adjusted prevalence ratios of the association of violence including threats and anxiety, post-traumatic stress disorder, and depression in trafficked males, n = 446

	Unadjusted Model		Adjusted Model 1[a]		Adjusted Model 2[b]	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI
Anxiety						
Violence						
No violence (referent)	1.0		1.0			
Physical violence with threats made with weapons	1.49	1.00-2.19*	1.41	0.86-2.31		
Receiving threats during trafficking						
None (referent)	1.0				1.0	
Personal threats	1.36	1.14-1.62***			1.33	1.08-1.64**
Both, personal and family threats	1.64	1.40-1.92***			1.68	1.43-1.97***
Post-Traumatic Stress Disorder						
Violence						
No violence (referent)	1.0		1.0			

	Unadjusted Model		Adjusted Model 1[a]		Adjusted Model 2[b]	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI
Physical violence with threats made with weapons	1.60	0.92-2.78	1.59	1.05-2.42*		
Receiving threats during trafficking						
None (referent)	1.0				1.0	
Personal threats	1.80	1.39-2.35***			1.75	1.51-2.03***
Both, personal and family threats	1.92	1.65-2.24***			1.62	1.31-2.00***
Depression						
Violence						
No violence (referent)	1.0		1.0			
Physical violence with threats made with weapons	1.39	0.83-2.33	1.47	0.91-2.36		
Receiving threats during trafficking						
None (referent)	1.0				1.0	
Personal threats	1.39	1.28-1.50***			1.46	1.35-1.57***
Both, personal and family threats	1.42	1.24-1.62***			1.33	1.11-1.58***

Note: Models for anxiety, depression, and post-traumatic stress disorder were run separately but they were adjusted for the same variables.

[a] Adjusted Model 1: age, country of exploitation, sector of exploitation, time in trafficking.

[b] Adjusted Model 2: age, country of exploitation, sector of exploitation, time in trafficking.

[c] PR: Prevalence ratio.

[d] 95% Confidence interval.

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

PTSD in males. Males subjected to physical violence with threats made with weapons had almost a 60% higher prevalence of PTSD (PR = 1.59; 95% CI: 1.05–2.42) when compared to males without violence after adjustment. Men and boys who received personal threats, and those receiving personal and family threats, had a 75% (PR = 1.75; 95% CI: 1.51–2.03) and 62% (PR = 1.62; 95% CI: 1.31–2.00) elevated prevalence for PTSD, respectively, when compared to males without threats and after adjustment.

In the model adjusted for violence (Model 1) and other covariates, males exploited in China and other countries had more than a threefold (PR = 3.84; 95% CI: 2.58–5.74) and a twofold (PR = 2.43; 95% CI: 1.43–4.14) higher prevalence for PTSD, respectively, when compared to males exploited in Thailand. Likewise, the model adjusted for threats (Model 2) and other covariates, showed that the prevalence for PTSD symptoms more than tripled (PR = 3.90; 95% CI: 2.27–6.67) and doubled (PR = 2.38; 95% CI: 1.25–4.55) among those exploited in China and other countries, respectively compared to males exploited in Thailand.

Depression in males. The prevalence of depression and physical violence with threats made with a gun, knife, or other weapon was elevated but did not differ significantly after adjustment. Males subjected to personal threats and both personal and family threats had a 46% (PR = 1.46; 95% CI: 1.35–1.57) and 33% (PR = 1.33; 95% CI: 1.11–1.58) greater prevalence for depression, respectively compared to those who were not threatened after adjustment.

In the model adjusted for violence and other covariates, there was an 80% higher prevalence of depression (PR = 1.81; 95% CI: 1.11–2.96) among males exploited in China compared to males exploited in Thailand.

Discussion

This is the first study to address a major gap in the literature on the mental health impact of human trafficking. I assessed the association of violence and coercion with mental health outcomes (anxiety, depression, and PTSD) among females and males trafficked in various sectors of exploitation. I found that the experience of violence and coercion (receiving personal threats or both personal and family threats) differed in females and males. Thus, I assessed their association with mental health stratified by sex. For females, experiencing both physical and sexual violence was a strong predictor of symptoms of anxiety, PTSD, and depression. In contrast, physical violence with threats made with weapons was strongly associated with symptoms of PTSD among males.

Another key finding in my study was that psychological abuse in the form of threats (personal and both personal and family threats) during the trafficking experience was consistently and strongly associated with anxiety, depression, and PTSD in both females and males. Coercion in females was strongly related to anxiety and PTSD, in particular for those receiving both personal and family threats. Although a similar pattern was observed in males, for females exposure to both personal and family threats was more detrimental to their mental health.

Although it is known that threats are central to human exploitation, this is, to my knowledge, the first study that documents the mental health impact of violence and threats in a diverse population of female and male survivors exploited in various sectors of forced labor.

Nevertheless, these findings are consistent with the overall literature on gender-based violence, and trafficking research that reports that sexual and physical violence are salient features of the trafficking experience among females (11, 12, 27, 28, 30, 32). Previous research

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on human trafficking, gender-based violence and interpersonal violence reports that experiencing more than one type of abuse (e.g., physical, sexual, and psychological or emotional) increases both the probability of having anxiety, depression, or PTSD symptoms as well as the severity of those symptoms (28, 65-68). Likewise, my results are in accordance with interpersonal violence (IPV) research that reports that psychological abuse in the form of coercion, power, and control for both men and women is strongly associated with an increased risk of symptoms of depression and PTSD, even after controlling for the effects of physical violence, injuries, and sexual coercion (69-71).

Violence for many trafficked individuals is a central element of the trafficking experience (12, 28, 72), and it was a salient feature in the present study. The IPV literature reports that the risk for experiencing life-threatening acts, including homicide, or acts of severe violence (e.g., being choked, kicked, or beaten) increases significantly when the threats are repeated or violence escalates (73, 74). This might explain, in part, the strong association that I found between threats and poor mental health in both females and males.

I found that experiencing both sexual and physical violence was strongly associated with poor mental health in women and girls. These types of violence (sexual and physical) are powerful methods to terrorize, dominate, and humiliate the enslaved individual, but sexual violence in particular is intentionally intended to produce psychological trauma (12, 13, 72). Beyond the trauma, sexual violence is also associated with an increased risk of HIV and other sexually transmitted diseases that can exacerbate physical and mental health problems (75). Therefore, experiencing both sexual and physical violence may potentiate the harm inflicted on the mental health of female trafficking survivors.

Physical violence with threats made with weapons was an important risk factor for PTSD for males in this population. Threats with weapons are another common method to exert psychological coercion, but this is the first study to document this impact in a population of male survivors of trafficking (12, 76). However, my finding is consistent with the relatively scant research about the nonfatal use of weapons in the context of interpersonal violence. Threats with weapons allow the aggressor to assert dominance in interpersonal relationships because they convey a pernicious threat, elicit compliance, and create extreme fear and intimidation, all of which are the hallmarks for coercive control (77, 78). Psychological coercive control is known to have deleterious effects on mental health as it involves terror, fear, isolation, and helplessness in order to destroy an individual's self-efficacy and autonomy and is a key feature of human trafficking (15, 70, 72).

Although the female burden of suffering both physical and sexual violence was expected and documented in previous research (25-29, 32, 79), the elevated prevalence for anxiety, depression, and PTSD in this population is of considerable concern. Similar elevated prevalence of depression and PTSD had been observed among populations exposed to mass conflict and displacement in which torture and trauma emerged as the strongest risk factor for PTSD and depression (80).

Males exploited in China had the highest risk for PTSD and depression followed by males exploited in other countries, while males exploited in Thailand had the lowest. For females, sector of exploitation was a stronger predictor of poor mental health than country of exploitation. Overall, females exploited in domestic work, cleaning, restaurant work, begging, and other; construction and factory work; and livestock, agriculture, and fishing all had a higher

prevalence for anxiety and PTSD symptoms. In contrast, women and girls exploited in sex work, forced marriage, entertainment, and dancing had lower prevalence for anxiety and PTSD.

This unexpected finding shows the need to further understand the relationship and mechanisms that operate among different sectors of exploitation and mental health. For instance, previous research on the Mekong region indicates that domestic workers tend to be more confined or "locked up" by their traffickers, which could lead to worse mental health, but further research is needed (81).

In contrast, a strong association with PTSD and depression was observed in males exploited primarily for construction and factory work and livestock (including meat preparation), agriculture, and fishing in China but also in seven other countries (Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia), indicating the diversification of labor exploitation in men and boys. Overall, these findings are consistent with previous research that highlights the need to amplify our understanding of the diversity and complexity of what constitutes human exploitation and how it is carried out globally in diverse countries and through many labor sectors for females and males (28, 82).

The finding of a higher prevalence of sexual exploitation among females, given that the study included women trafficked in countries such as Thailand and China, is not unexpected. More than half of the population of females was exploited in Thailand and more than a third in China. The governments of Thailand and China are not fully compliant with the Trafficking Victims Protection Act's minimum standards of prosecution, protection, and prevention of human trafficking (76).

Thailand is recognized as a key destination for human trafficking of females, males, and children in the Mekong region in addition to being a source and transit country for forced labor

and sex trafficking (83). Thai victims of trafficking and some of the estimated three to four

million migrant workers in Thailand are forced, coerced, or defrauded into labor (e.g.,

commercial fishing and related industries, factories, and agriculture) or sex trafficking (83).

Corruption of some officials continues to undermine anti-trafficking efforts as it is reported that

officials profit from trafficking and other criminal offenses committed against trafficking victims

(e.g., protecting brothels and other commercial sex venues from raids and inspections and

colluding with traffickers) (76).

China is also a source, transit, and destination country for men, women, and children

subjected to sex trafficking and forced labor, including domestic servitude, brides, begging, and

working in factories, among others (76). The Chinese government does not directly provide data

on anti-trafficking law enforcement efforts. Although China's criminal code prohibits many

forms of trafficking defined as a series of criminal acts (e.g., abduction, kidnapping, purchasing,

and selling), it does not apply to men and the acts that comprise the crime are not tied to a

purpose of exploitation, such as forced labor or forced prostitution, which is how international

law defines trafficking in persons. Chinese law does not criminalize facilitating the prostitution

of boys under 18 or girls between the ages of 14 and 18 (76).

An important limitation of this analysis is the cross-sectional design; hence causality and

the temporal relationship between violence, threats, and mental health symptoms (anxiety,

PTSD, and depression) cannot be established. Individuals with poor mental health could be more

vulnerable to being trafficked or have a history of violence. However, previous studies on human

trafficking, violence and women's health suggest that mental health problems are more likely to

be the result of abuse rather than its precursor (15, 25, 75, 84).

Assessment of mental health symptoms was conducted with screening instruments with robust psychometric properties; these instruments are commonly used in general populations in some of the study countries and in post-trafficking services. However, these instruments are not gold-standard diagnostic tools to clinically assess these disorders and they have not been validated with this study population. Thus, an overestimation of the prevalence ratio of mental health outcomes is possible. However, it is also plausible that trafficked individuals under the harshest forms of slavery and exploitation are the ones with worse mental health and may be less likely to be reached in post-trafficking services. In this case, my estimates of the prevalence ratio will be underestimates. Nonetheless, the direction and magnitude of the associations observed are consistent with previous studies (25, 28, 30, 32).

The study population represents a sample of survivors of trafficking using post-trafficking services. Service eligibility and screening processes for referral to post-trafficking services may vary between countries as human trafficking is often defined according to the legal framework of the country. Therefore, the results of the study may not be generalizable to the broader population of trafficked individuals. However, this population is likely to be representative of trafficked individuals in similar forced labor conditions in the countries in question, as violence and threats are known to be core components of any human trafficking situation.

Another plausible limitation is underreporting of sexual violence in males. Overall, research on sexual abuse and sexual assault of men and boys in all settings is scarce (85, 86). Previous studies indicate that the perpetration of sexual violence in males is more common in boys than in adult males (87-89). Children, in particular, rarely disclose sexual abuse after the event, and disclosure tends to be a process rather than a single question or interview (86).

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Male adults are more likely to be sexually assaulted by multiple assailants and to have weapons used against them (90, 91). In my study, I found that physical violence with threats made with weapons was a salient risk factor for mental health among males. Sexual abuse and violence against trafficked boys and males needs further research as well as consideration of the role that culture plays in sexual violence.

My study has important clinical, public health, and policy implications. Addressing the mental health needs of survivors of trafficking is complex and requires a culturally sensitive, holistic, and multi-tiered system approach that involves immediate and ongoing post-trafficking services (e.g., mental and physical health, social services, safety, housing, legal counsel, economic aid, and community and societal reintegration). It is also important to take into account that survivors of trafficking may need time to process their traumatic experience and may require assistance with other immediate needs (e.g., safety, immigration, or legal services). By the same token, assistance and protection of survivors of trafficking should be given regardless of their country of origin, legal status, and participation in the legal prosecution of traffickers.

A fundamental element of care for trafficked individuals needs to involve a collaborative approach to care that provides a safe and healing space that highly regards a partnership with the survivor of trafficking, respects her or his perspective, and acknowledges human rights principles as the driving force for service provision. Given the diverse demographic background and traumatic experiences endured by trafficked individuals, it is important that service providers be well trained with strong multicultural competencies and knowledge of the various forms of exploitation, abuse, and violence, as well as with the identification of potential cases of human trafficking.

The efficacy of psychological treatments for survivors of human trafficking has not been investigated. Western treatments may not fully capture the complexity of the psychological responses that arise from individuals who have experienced human right violations (92, 93). However, evidence based-treatments, such as Narrative Exposure Therapy (NET) or Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT), that had been used with refugees may be tailored for adult and adolescent trafficked individuals. NET was originally developed for multiply traumatized victims of organized violence in resource-poor settings, where it can be delivered by trained non-professionals (94). A modified version of TF-CBT has been developed for children exposed to multiple complex traumas, and it is commonly used in children and adolescents with PTSD (95). The use of these therapies, or any other therapy, will need to be systematically evaluated in enslaved populations.

In conclusion, it is important for policy makers and stake holders to consider the complex and severe effects that human trafficking inflicts on the mental health of survivors of trafficking. Strengthening protection and service provisions, including mechanisms to protect survivors of trafficking and family members susceptible to retaliation and threats from traffickers, is critical. Further research on the development and implementation of mental health interventions and treatment approaches for survivors of trafficking is warranted. Public health and epidemiological approaches and methodologies could be valuable to furthering understanding of human slavery within a health equity framework to strengthen individuals' and communities' capacities to prevent and address forced labor globally.

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Chapter 3

Living, Working, and Legal and Economic Insecurity Conditions (Aim 2)

Introduction

Human trafficking is the world's fastest growing crime with exponential profit margins of US$150 billion annually and approximately 40.3 million people (including children) forcefully exploited in various labor sectors (1, 2). Human trafficking is a fundamental human rights violation and a serious public health problem that carries substantial health, social, economic, legal, and policy implications (3-5). Although most trafficking research has focused on sex trafficking, recent literature has begun to illuminate the diversity of enslaved individuals and sectors of exploitation (6, 7). One important consequence of forced labor and exploitation is poor mental health (6). Studies on trafficking survivors receiving post-trafficking services indicate elevated prevalence of anxiety, post-traumatic stress disorder (PTSD), and depression (6, 8). However, to my knowledge, scant research been done on the effects of contextual factors, such as living, working, and legal and economic insecurity conditions, on the mental health of survivors of trafficking exploited in different occupational sectors (6). These contextual factors are embedded in the trafficking experience and could impact the mental health of trafficking survivors (4, 6, 7).

Previous research among trafficking survivors reports a wide range of deplorable and inhumane living and working conditions as well as legal and economic insecurity factors (4, 6, 7, 9-13). Poor living conditions include lack of provision for basic needs, such as lack of drinking

water and food, limited access to toileting and poor hygiene conditions, dangerous living conditions, lack of personal freedom, and confinement, among others (6, 10). Unsafe and dangerous working conditions may include lack of protective equipment (e.g., condoms or helmets), extremely long work hours or indefinite work hours, exposure to hazardous substances and chemicals, being forced to work under adverse weather conditions, and lack of breaks. Legal and economic insecurity comprises lack of remuneration of any kind, confiscation of identity or travel documents, and incarceration or detention (6, 10).

Previous research in the general population shows that living conditions, including poor housing, crowding, noise, indoor air quality, and poor lighting, are associated with psychological distress, sleep deprivation, violence, anxiety, and depression (14-16). While similar conditions are endured by trafficking survivors (4), their impact on survivors' mental health is unknown.

In addition, both acute and chronic exposure to uncontrollable environmental stressors, such as acute noise and crowding, are associated with learned helplessness in both children and adults (17-20). Helplessness, a well-described psychological condition in which the individual feels defenseless and accepts the adverse situation (15, 20-23) is associated with depression and anxiety (24-26). Forced labor conditions that involve poor living conditions are characterized by the trafficked individuals' lack of control of the surrounding environment.

Similarly, research on non-trafficked workers reports that the psychosocial work environment and the physical work environment can have an impact on the mental health of workers (27, 28). Poor working conditions, such as physical and chemical exposures, shift work, jet lag, long working hours, and job strain or inability to influence one's own working conditions, are associated with an increased risk of anxiety and depression (28-33). Work stress can result in psychosomatic symptoms, such as headaches, fatigue, sleep disturbance,

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gastrointestinal problems, and concentration or memory difficulty, all of which are known to be associated with anxiety and depression (34, 35). Similar physical symptoms in females trafficked primarily for commercial sex are reported in studies of trafficking survivors receiving post-trafficking services (11, 36, 37).

Employment in occupations involving exposure to work-related threats is a strong risk factor for anxiety, depression, and other stress-related disorders in females and males (29, 38). Severe work stress can also be an important risk factor for suicide (32, 39, 40), and research on trafficked individuals reports a high prevalence of suicide attempts and self-harm (41, 42). Symptoms of anxiety, PTSD, and depression are reported among workers in meat processing plants, domestic work, factory and construction work, and sex work (43-47), all common occupational sectors for forced laborers.

Given the heterogeneity in sectors of exploitation, levels of exploitation, and types of dangerous conditions (living, working, and legal and economic insecurity) that entail psychological trauma and abuse, the aim of this study was to assess the association between living, working, and legal and economic insecurity conditions and the mental health (in terms of anxiety, depression, and PTSD) of trafficking survivors exploited in various labor sectors. This is important because the experience of trafficking is not static, and the influence of contextual factors could shape not only a person's trafficking experience but also contribute to the mental health consequences of having been trafficked. To my knowledge, no studies have assessed the impact of these factors on the mental health of trafficking survivors, suggesting that they warrant further research.

Methods

Data Source, Study Design, and Study Sample

This study is a secondary analysis using data from the Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (7), also known as the STEAM. The study methodology has been described in Chapter 2. The STEAM interviewed 1,102 participants, of whom 87 were excluded as they did not reach the destination country of exploitation. This cross-sectional study included 1,015 trafficking survivor males, females, youth, and children (aged 10–17 years) who attended post trafficking assistance services in Cambodia, Thailand, and Vietnam.

Sample Design

A two-stage sampling strategy was employed to identify individuals using post-trafficking services. First, 15 post-trafficking service providers were selected in Cambodia, Thailand, and Vietnam based on sociodemographically diverse profiles (e.g., age, sex, sector of exploitation, and country of origin), relationship with International Office of Migration (IOM) country teams, and agreements with government agencies. Trafficked cases were referred to service providers by police and immigration services, non-governmental and international organizations, and government agencies.

Participants who received post-trafficking services were included in the study regardless of differing legal definitions of trafficking and service eligibility criteria between countries (6). For instance, the data from Thailand represented individuals accessing services managed by the government who had agreed to participate in legal cases against traffickers (48).

Second, a consecutive sample of individuals voluntarily agreed to participate in a structured interview within 2 weeks of admission to the post-trafficking services. Individuals

were invited to participate in the study after determining that their participation would not cause harm to their well-being. Recruitment took place across the sites between October 2011 and May 2013. The response rate for the survey was 98%.

Data Collection and Development of Survey Questionnaire

Interviewers were staff caseworkers or social workers from participating post-trafficking services and IOM partners, all of whom received an intense 1-week training provided by one of the principal investigators of the STEAM (LK) in collaboration with the IOM partners in each country. Participants were interviewed by caseworkers or social workers, with the aid of interpreters when needed, and for those who were under 18 years old, the child's care team were consulted with additional written consent by the legal guardian. Data collection and double data entry were coordinated by IOM country offices with oversight by the London School of Hygiene and Tropical Medicine (LSHTM).

The survey questionnaire was adapted from a prior instrument used in a European study on health and sex trafficking (49). The questionnaire was pilot tested in the study settings before data collection on participants' demographic characteristics and pre-trafficking and post-trafficking exposures (e.g., violence and mental health), including living and working conditions during trafficking. The instrument was professionally translated into Khmer, Thai, Vietnamese, Burmese, and Lao from English, with iterative group translation-discussions with IOM counter-trafficking teams, pilot-testing, and review after back-translation into English.

Ethics

Ethical approval for the study was granted by the LSHTM and by the National Ethics Committee for Health Research in Cambodia, the Hanoi School of Public Health in Vietnam, and

the Ministry of Social Development and Human Security in Thailand. A strict ethical and safety protocol was implemented based on the World Health Organization (WHO) *Ethical and Safety Recommendations for Interviewing Trafficked Women* (50)*.* This present study has been approved by the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board, eResearch ID: HUM00097096.

Anxiety, Depression, and Post-Traumatic Stress Disorder Measures

Anxiety and depression symptoms in the past week were measured by the Hopkins Symptom Checklist-25 (HSCL-25), a symptom inventory which measures symptoms of anxiety and depression (51). It consists of 25 items: 10 items for anxiety symptoms and 15 items for depression symptoms. The scale for each question includes four categories of response ("Not at all," "A little," "Quite a bit," and "Extremely," rated 1 to 4, respectively). Two scores are calculated: the anxiety score is the average of all 10 items, while the depression score is the average of the 15 depression items. The depression score is correlated with major depression as defined by the *Diagnostic and Statistical Manual of the American Psychiatric Association*, 4th edition (*DSM-IV*) in several populations (51, 52). A cutoff of 1.625 was used to identify symptoms of depression as item 12 in the questionnaire (sexual interest) was excluded, given the nature of the population in the study. For anxiety, a cutoff of 1.75 determined symptoms of anxiety, based on previous research on individuals using post-trafficking services and studies of Cambodian, Laotian, and Vietnamese refugees in which this instrument has been validated (9, 53-55).

Post-traumatic stress disorder symptoms in the past week were measured using the 27 trauma symptoms from the Harvard Trauma Questionnaire part IV (56). The first 16 items such as "recurrent thoughts or memories of the most hurtful or terrifying events" or "feeling as though

the event is happening again" were derived (52) from the *DSM-IV* criteria for PTSD symptoms (e.g., intrusive experiencing, avoidance behaviors, hyper vigilance, and emotional numbing). The rest of the items describe symptoms that focus on the impact that the traumatic experience may exert on an individual's life (51, 56). Each question has four response categories: "Not at all," "A little," "Quite a bit," and "Extremely," rated 1 to 4, respectively. A total score was calculated by averaging the 27 items. A cutoff of 2.0 was used to assess symptoms of PTSD based on previous research on trafficked individuals accessing post-trafficking services (6, 11, 57).

Living and Working Conditions and Legal and Economic Insecurity Measures

Questions to assess living conditions included 10 items related to adverse living conditions, such as living and sleeping in overcrowded rooms or in dangerous conditions (e.g., close to a generator or engine), sleeping on the floor or having nowhere to sleep, poor basic hygiene, insufficient food and water, no clean clothing, no or very few rest breaks, overexposure to adverse weather conditions (sunlight or rain), being locked in a room, and restricted freedom (never being free to do what they wanted or go where they wanted). Based on the distribution of the variable, I categorized these ten questions into one, three-level variable: 0 (0 or 1 adverse living condition), 1 (2 or 3 adverse living conditions), and 2 (4 or more adverse living conditions).

Excessive work hours in the forced labor sector were determined based on the International Labour Organization's *International Standards on Working Time* and combined two variables: hours worked per day and hours worked per week (58). I defined non-abusive working time as less than 8 hours of work per day or 40 hours per week. Working time of 8-10 hours per day or 40-48 hours per week were defined as excessive. Extremely excessive working time included more than 10 hours per day or more than 48 hours per week, or no fixed time (> 24

hours) (58, 60). Legal and economic insecurity (yes or no) during trafficking was assessed with items related to confiscation of documents (personal identification or travel documents), economic exploitation (lack of remuneration), and being in detention in the destination country of exploitation (10).

Covariates

Covariates included in this analysis were based on theory and prior analyses of the STEAM (6, 10, 11, 60) and included age (10–17, 18–25, and 26 or above), country of exploitation (Thailand, China, or other [Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia]), and sector of exploitation. Participants were asked about the type of exploitative sector they were in most recently. Sectors of exploitation were defined as sex work, forced marriage, entertainment, or dancing; domestic work, cleaning, restaurant work, or begging; construction and factory work; livestock, meat packing and preparation, agriculture, and fishing, and were assessed identically in males and females. I collapsed two sectors of exploitation in males due to small sample size in some sectors and based on previous literature suggesting that some sectors of exploitation share similar levels of violence (6, 11, 61).

For threats, two questions evaluated emotional or psychological abuse during the trafficked period: (a) "While you were in this situation, did anyone threaten to hurt you?" (yes or no) and (b) "During this time did anyone threaten to hurt your family or someone you care about?" (yes or no). These questions assess threats commonly made by traffickers that are considered hallmarks of the trafficking experience and are frequently used in studies of interpersonal violence (4, 6, 49, 62).

Statistical Analysis

I conducted bivariate analyses using Rao-Scott chi-square tests to account for clustering in the data by post-trafficking services and to assess associations of living, working, and legal and economic insecurity conditions with anxiety, depression, and PTSD symptoms. Unadjusted and adjusted modified Poisson regression models were used to estimate prevalence ratios (PRs) and their 95% confidence intervals (CI) for the association between living, working, and legal and economic insecurity conditions, and mental health symptoms (anxiety, depression, and PTSD) by sex (63-65). Because of important sex differences in the distribution of the sectors of exploitation and other sociodemographic factors, analyses were stratified by sex.

The fit of the model was assessed by the independence model criterion (QIC) statistic, which is robust to the selection of correlation structure (66). Generalized estimation equations (GEEs) with an extension of the sandwich variance estimator were used to calculate a robust variance estimation that considers the level of correlation of observations within a cluster and produces standard errors of the estimates accordingly (67). An exchangeable correlation structure that assumes that observations on the same cluster have a common correlation was used to account for cluster sampling.

I fit modified Poisson regression models for each of the outcome variables (anxiety, depression, and PTSD) stratified by sex. Adjusted models controlled for covariates were run by anxiety, depression, and PTSD. All analyses were performed using SAS version 9.4 (SAS Institute, Inc., Cary, NC). PROC SURVEYFREQ with a cluster and *chisq* statement were used for the descriptive analysis. PROC GENMOD was used with the robust variance estimator provided by the REPEATED statement with a cluster identifier that uses the method of

generalized estimating equations to estimate the model and give a proper estimate of the standard error of the PRs while accounting for clustering in the data.

Results

Descriptive characteristics of the study population stratified by sex are presented in Table 3-1. A total of 569 (56.1%) females and 446 (43.9%) males participated in the survey. Males were more likely to report four or more precarious living conditions during trafficking than females (72.9% versus 24.3%). More than a quarter of females (29.4%) and one fifth of males (20.4%) experienced two to three adverse living circumstances, while almost half of the females (46.4%) reported none or one precarious living conditions.

Work hours of forced labor for both males and females were excessive. Extremely excessive working time (> 10 hours) was higher among males (44.6%) than females (18.1%). However, no fixed time or indefinite work hours (> 24 hours) were reported by almost a half of the sample of females (44.1%) and more than a third of males (36.4%). Excessive working time (8 to 10 hours) was more likely among females (17.2%) than males (11.5%).

Females working more than 24 hours were most likely to be trafficked in the sectors of sex work, forced marriage, entertainment, and dancing (45.0%; n = 175). These sectors of exploitation were comprised primarily of children (58.3%; n = 239) and adolescents (34.2%; n = 140). Likewise, females exploited in sex work, forced marriage, entertainment, and dancing were deceived into trafficking. 6.3% (n = 26) were not given any information at all about the type of job they were going to perform; 50.5% (n = 207) were told inaccurate information; and 43.2% (n = 177) were given partially inaccurate information about the job. Data not shown in table.

Table 3-1 Living and working conditions of trafficked survivor females and males: The Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM), n = 1,015

	Total n (%)	Females n (%)	Males n (%)
Total	1015	569 (56.1)	446 (43.9)
Living and Working Conditions			
Number of adverse living conditions during trafficking			
0–1	294 (29.0)	264 (46.4)	30 (6.7)
2–3	258 (25.4)	167 (29.4)	91 (20.4)
4 or more	463 (45.6)	138 (24.3)	325 (72.9)
Length of usual work day (hours)[a]			
< 8	146 (15.0)	113 (21.0)	33 (7.5)
8 to 10	145 (15.0)	94 (17.2)	51 (11.5)
> 10	296 (30.0)	99 (18.1)	197 (44.6)
No fixed time (> 24)	402 (41.0)	241 (44.1)	161 (36.4)
Legal and Economic Conditions			
Was in detention or in prison in the destination country[b]			
Yes	245 (24.2)	118 (21.0)	127 (28.5)
No	767 (76.0)	448 (79.2)	319 (71.5)
Had identity or travel documents[c]			
Yes	314 (31.0)	217 (38.1)	97 (21.8)
No	700 (69.0)	352 (61.9)	348 (78.2)
Received monetary compensation[d]			
Yes	380 (37.7)	249 (44.2)	131 (29.4)
No	629 (62.3)	315 (55.9)	314 (70.6)

[a] 4 males & 22 females missing.
[b] 3 females missing.
[c] 1 missing male.
[d] 5 females & 1 male missing.

For males, those working more than 10 hours per day (n = 167; 37.8%) or more than 24 hours (n = 108; 24.4%) were more commonly exploited in the sectors of livestock, meat packing and preparation, agriculture, and fishing. The use of deceptive practices in these sectors for males was very common; 11.0% (n = 33) were not provided with any information about the job they were going to perform; 55.0% (n = 164) were given false information about the job, and 34.1% (n = 102) were given partial information about the job. Data not shown in table.

More than a quarter of males (28.5%) and one fifth of females (21.0%) were detained in an immigration detention center or a jail after being trafficked. Females were more likely to have identifying or travel documents (38.1%) while less than a quarter of males (21.8%) had documents. More than a third of females (44.2%) and more than a quarter of males (29.4%) received some monetary compensation during trafficking.

Crude and Adjusted Prevalence Ratios of Living and Working Conditions and Legal and Economic Insecurity Factors in Females and Males

Anxiety. Results of the crude and adjusted modified Poisson regression models for the association of living and working conditions and legal and economic insecurity factors with anxiety, for females and males, are presented in Table 3-2.

After adjustment, the association between prevalence of anxiety and adverse living conditions was attenuated in both females and males but remained statistically significant. Compared to females with none or one adverse living event during trafficking, the prevalence of anxiety among those with two or three, or four or more, adverse living conditions was more than 50% (PR = 1.59; 95% CI: 1.24–2.04) and 70% (PR = 1.72; 95% CI: 1.33–2.24) higher, respectively. In contrast, males had a twofold greater prevalence of anxiety with two or three (PR = 2.05; 95% CI: 1.00–4.22), or four or more (PR = 2.21; 95% CI: 1.24–3.96), adverse living conditions after adjustment, compared to males with none or one adverse living event during trafficking.

Table 3-2 Association of living, working, and legal conditions with anxiety for trafficked females (n = 569) and males (n = 446): Crude and adjusted prevalence ratios

	Females anxiety				Males anxiety			
	Unadjusted model		Adjusted[a] model		Unadjusted model		Adjusted[b] model	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI	PR	95% CI
Living and Working Conditions								
Number of adverse living conditions during trafficking								
0–1 (referent)	1.0		1.0		1.0		1.0	
2–3	1.95	1.58-2.42***	1.59	1.24-2.04***	2.58	1.08-6.15*	2.05	1.00-4.22*
4 or more	2.38	2.04-2.77***	1.72	1.33-2.24***	3.09	1.54-6.23***	2.21	1.24-3.96**
Length of usual work day (hours)								
< 8 (referent)	1.0		1.0		1.0		1.0	
8 to 10	1.81	1.41-2.32***	1.58	1.27-1.97***	1.76	1.13-2.76**	1.65	1.01-2.70*
> 10	2.23	1.90-2.62***	1.55	1.19-2.02***	1.59	0.97-2.60	1.32	0.77-2.28
No fixed time (>24)	1.47	1.24-1.74***	1.27	0.98-1.64	1.80	1.34-2.40***	1.53	1.02-2.27*
Legal and Economic Conditions								
Had identity or travel documents								
Yes (referent)	1.0		1.0		1.0		1.0	
No	1.13	0.81-1.58	1.04	0.76-1.42	0.70	0.58-0.84***	0.74	0.60-0.91**
Received monetary compensation								
Yes (referent)	1.0		1.0		1.0		1.0	
No	1.43	1.13-1.80**	0.90	0.65-1.24	1.04	0.84-1.28	0.90	0.77-1.06
Was in detention in the destination country								
No (referent)	1.0		1.0		1.0		1.0	
Yes	1.17	0.92-1.49	1.04	0.87-1.25	1.61	1.23-2.11***	1.48	1.22-1.78***

[a] Females adjusted model: age, sector of exploitation, threats, living conditions, length of work hours in a day, identity or travel documents, and monetary compensation.
[b] Males adjusted model: age, sector of exploitation, threats, living conditions, length of work hours in a day, identity or travel documents, monetary compensation, and detained in destination country.
[c] PR: Prevalence ratio.
[d] 95% Confidence interval.
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$.

Table 3-3 Association of living, working, and legal conditions with depression for trafficked females (n = 569) and males (n = 446): Crude and adjusted prevalence ratios

	Females depression				Males depression			
	Unadjusted model		Adjusted[a] model		Unadjusted model		Adjusted[b] model	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI	PR	95% CI
Living and Working Conditions								
Number of adverse living conditions during trafficking								
0-1 (referent)	1.0		1.0		1.0		1.0	
2-3	1.37	1.12-1.68**	1.23	1.06-1.44**	3.10	1.47-6.54***	2.55	1.64-3.95***
4 or more	1.38	1.23-1.56***	1.15	1.02-1.29*	3.17	1.55-6.47***	2.63	1.62-4.26***
Length of usual work day (hours)								
< 8 (referent)	1.0		1.0		1.0		1.0	
8 to 10	1.32	1.14-1.52***	1.29	1.16-1.44***	2.59	2.20-3.04***	1.92	1.23-2.99**
> 10	1.54	1.34-1.75***	1.47	1.25-1.74***	2.00	1.58-2.53***	1.42	0.98-2.06
No fixed time (> 24)	1.27	1.09-1.47**	1.23	1.09-1.38***	2.11	1.69-2.62***	1.53	0.97-2.41
Legal and Economic Conditions								
Had identity or travel documents								
Yes (referent)	1.0		1.0		1.0		1.0	
No	1.07	0.97-1.18	0.92	0.83-1.02	0.73	0.60-0.88***	0.77	0.71-0.83***
Received monetary compensation								
Yes (referent)	1.0		1.0		1.0		1.0	
No	1.17	1.02-1.34	0.98	0.84-1.14	0.99	0.83-1.18	0.85	0.74-0.97**
Was in detention in the destination country								
No (referent)	1.0		1.0		1.0		1.0	
Yes	1.06	0.89-1.26	1.00	0.84-1.19	1.34	1.10-1.63**	1.30	1.17-1.44***

[a] Females adjusted model: age, sector of exploitation, threats, living conditions, length of work hours in a day, identity or travel documents, monetary compensation, and detained in destination country.
[b] Males adjusted model: age, sector of exploitation, threats, living conditions, length of work hours in a day, identity or travel documents, monetary compensation, and detained in destination country.
[c] PR: Prevalence ratio.
[d] 95% Confidence interval.
* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

Table 3-4 Association of living, working, and legal conditions with post-traumatic stress disorder (PTSD) for trafficked females (n = 569) and males (n = 446): Crude and adjusted prevalence ratios

	Females PTSD				Males PTSD			
	Unadjusted model		Adjusted[a] model		Unadjusted model		Adjusted[b] model	
	PR[c]	95% CI[d]	PR	95% CI	PR	95% CI	PR	95% CI
Living and Working Conditions								
Number of adverse living conditions during trafficking								
0–1 (referent)	1.0		1.0		1.0		1.0	
2–3	1.95	1.41-2.70***	1.74	1.04-2.90*	3.77	1.86-7.63***	2.93	1.65-5.19***
4 or more	2.02	1.44-2.85***	1.73	0.91-3.30	3.51	1.52-8.11*	2.39	1.39-4.10***
Length of usual work day (hours)								
< 8 (referent)	1.0		1.0		1.0		1.0	
8 to 10	1.46	1.18-1.79***	1.49	1.26-1.77***	6.09	3.62-10.24***	4.47	2.30-8.67***
> 10	2.35	1.45-3.80***	2.06	1.11-3.81*	4.92	3.20-7.57***	3.35	1.90-5.92***
No fixed time (>24)	1.59	1.07-2.35*	1.70	1.04-2.79*	5.33	2.14-13.28***	3.84	1.79-8.25***
Legal and Economic Conditions								
Had identity or travel documents								
Yes (referent)	1.0		1.0		1.0		1.0	
No	1.02	0.80-1.29	0.97	0.75-1.26	0.83	0.57-1.21	0.96	0.81-1.15
Received monetary compensation								
Yes (referent)	1.0		1.0		1.0		1.0	
No	1.15	0.94-1.40	0.69	0.46-1.05	1.28	0.96-1.73	1.04	0.79-1.35
Was in detention in the destination country								
No (referent)	1.0		1.0		1.0		1.0	
Yes	1.00	0.73-1.37	0.79	0.58-1.08	1.53	1.18-1.99***	1.49	1.21-1.83***

[a] Females adjusted model: age, sector of exploitation, threats, living conditions, length of work hours in a day, identity or travel documents, monetary compensation, and detained in destination country

[b] Males adjusted model: age, sector of exploitation, threats, living conditions, length of work hours in a day, identity or travel documents, monetary compensation, and detained in destination country.

[c] PR: Prevalence ratio.

[d] 95% Confidence interval.

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

In the adjusted model, men and boys who worked indefinite work hours had a 50% (PR = 1.53; 95% CI: 1.02–2.27) higher prevalence of anxiety compared to those working less than eight hours. In contrast, among females without a fixed work time, the estimate was reduced after adjustment and did not differ for anxiety. Males who worked 8–10 hours had more than a 60% greater prevalence for anxiety (PR = 1.65; 95% CI: 1.01–2.70). Similarly, females who worked 8–10 hours (PR = 1.58; 95% CI: 1.27–1.97) and more than 10 hours (PR = 1.55; 95% CI: 1.19–2.02) a day had more than a 50% higher prevalence of anxiety when compared to those working less than 8 hours a day and after adjustment.

In adjusted models, the prevalence of anxiety was not statistically associated among females who did not have their identity or travel documents, did not receive some monetary compensation, or were in detention centers while being trafficked. In contrast, males without documents had 26% (PR = 0.74; 95% CI: 0.60–0.91) lower prevalence of anxiety compared to those with identity or travel documents. After adjustment of covariates, men and boys placed in detention in the destination country had almost a 50% elevated prevalence of anxiety (PR = 1.48; 95% CI: 1.22–1.78) compared to males not in detention.

Depression. Table 3-3 shows the results from the crude and adjusted modified Poisson regression models for living and working conditions and legal and economic insecurity factors and depression. The prevalence of depression more than doubled among males that suffered two or three (PR = 2.55; 95% CI: 1.64–3.95) or four or more (PR = 2.63; 95% CI: 1.62–4.26) adverse living conditions, compared to those reporting none or one adverse living event during trafficking. In contrast, after controlling for covariates, for females the prevalence of depression was more than 10% in those reporting two or three adverse living conditions (PR = 1.23; 95%

CI: 1.06–1.44) or four or more poor living conditions (PR = 1.15; 95% CI: 1.02–1.29), compared to those reporting none or one adverse living conditions.

Males working 8 to 10 hours had a 90% (PR = 1.92; 95% CI: 1.23–2.99) higher prevalence of depression compared to males working less than eight hours. In contrast, the association of depression and working hours in females was more than 20% for those working 8 to 10 hours (PR = 1.29; 95% CI: 1.16–1.44) and for those working more than 24 hours per day (PR = 1.23; 95% CI: 1.09–1.38), respectively, compared to those working fewer than eight hours. Women and girls working more than 10 hours had the highest prevalence of depression (47%) after adjustment (PR = 1.47; 95% CI: 1.25–1.74).

For females, having their identity or travel documents, not receiving any monetary compensation, or being in a detention center during trafficking was not statistically associated with depression. Conversely, for males there was a 15% (PR = 0.85; 95% CI: 0.74–0.97) and 23% (PR = 0.77; 95% CI: 0.71–0.83) lower prevalence of depression among those who did not receive any monetary compensation and those who did not have travel or identity documents during the time they were being trafficked. For men and boys in detention centers, the prevalence of depression was slightly attenuated after adjustment and was about 30% greater (PR = 1.30; 95% CI: 1.17–1.44) than among those who were not in detention.

PTSD. Results from the crude and adjusted modified Poisson regression models for living and working conditions and legal and economic insecurity factors and PTSD are presented in Table 3-4.

For women and girls with two to three adverse living conditions, the prevalence of PTSD was greater than 70% (PR = 1.74; 95% CI: 1.04–2.90) compared to those with none or one adverse living event. However, the prevalence of PTSD in women and girls with four or more

adverse living events, while elevated, did not differ after adjustment. For men and boys, after adjustment for covariates, the prevalence of PTSD more than doubled among those with two or three (PR = 2.93; 95% CI: 1.65–5.19), and four or more (PR = 2.39; 95% CI: 1.39–4.10) adverse living events, compared to males with none or one adverse living conditions.

Compared to females working less than eight hours per day, the prevalence of PTSD doubled among females working more than 10 hours (PR = 2.06; 95% CI: 1.11–3.81). Likewise, after adjustment for covariates, females working 8 to 10 hours (PR = 1.49; 95% CI: 1.26–1.77) or indefinite work time (> 24 hours; (PR = 1.70; 95% CI: 1.04–2.79) had more than a 40% and 70% greater prevalence of PTSD, respectively, compared to females working less than 8 hours. The association of working hours and PTSD was stronger in males than females. After adjustment, men and boys working 8 to 10 hours had more than four times higher prevalence of PTSD when compared to those working less than eight hours (PR = 4.47; 95% CI: 2.30–8.67). Likewise, males working more than 10 hours (PR = 3.35; 95% CI: 1.90–5.92) or more than 24 hours (PR = 3.84; 95% CI: 1.79–8.25) had more than a threefold elevated prevalence of PTSD.

For both females and males, having identity or travel documents or being monetarily compensated did not differ for the presentation of PTSD symptoms. However, after adjustment, trafficked males in detention centers had almost a 50% elevated prevalence of PTSD (PR = 1.49; 95% CI: 1.21–.83) compared to those not placed in detention.

Discussion

To my knowledge, this is the first and largest quantitative health-related trafficking study that documents the associations of living, working, and legal and economic insecurity conditions on the mental health of trafficked females and males exploited in different labor sectors. My results indicate a strong association between living conditions and poor mental health for both

females and males. I found differences by sex in the association between these contextual factors of the experience of trafficking and the mental health of trafficking survivors.

While for females poor living conditions were strongly associated with anxiety, PTSD, and depression, the association in males with each of the three outcomes more than doubled. These findings are consistent with prior research that has found living conditions to be an important factor for people's health and mental health (68-70). Prior studies report that substandard living conditions (e.g., lack of safe drinking water and unsanitary conditions, noise, crowding, dampness, moldy conditions, and cold or excessively hot indoor conditions) and social isolation can affect health in multiple ways including negative impacts on mental health disorders such as anxiety and depression (15, 16, 71-74). Additionally, psychosocial stressors produced by living under adverse conditions may play a role in undermining mental health. It is well documented that complex psychophysiological processes that involve interactions among psychological, behavioral, neural, endocrine, and immune responses can be triggered by environmental (e.g., poor working and living conditions) and psychosocial stressors, which may influence the development of inflammatory disease and stress-related disorders, such as anxiety, PTSD, and depression (18, 74-78).

Another key finding was that excessive working hours during trafficking was strongly associated with anxiety, PTSD, and depressive symptoms for females and males. Excessive working hours and an indefinite number of work hours elevated the prevalence of anxiety, depression, and especially PTSD symptoms among men and boys. In contrast, for females, such working hours were particularly associated with a higher prevalence of depression and PTSD.

While these findings were expected, given the exploitative nature of trafficking and the fact that in Asia and the Pacific, legal working time standards are not well regulated or do not

exist (59), the level of exploitation and abuse in men and boys, and its association with mental

health, to my knowledge, has not been documented before in trafficking research.

My findings are also in line with research in the general working population.

Longitudinal and cross-sectional studies with the working population indicate a relationship

between long working hours and symptoms of anxiety and depression, (79-82). The Whitehall II

study, a prospective cohort of British civil servants with a five-year follow-up, reported that

working more than 55 hours per week was associated with depressive and anxiety symptoms.

Each 10-hour increase in work was related to 17% and 22% increase in risk of depressive and

anxiety symptoms, respectively (79). Length of working hours is also a key factor for the health

and safety of workers and increases the risk of suffering mental illness, sleep deprivation,

suicide, and even death (6, 42, 83-86).

A plausible explanation for my finding relating long working hours and poor mental

health could be physical exhaustion and sleep deprivation (86). Sleep has important homeostatic

functions and sleep deprivation is a known stressor with consequences involving hypertension,

an increase in parasympathetic tone, proinflammatory cytokines, oxidative stress, cortisol, and

insulin (acute sleep deprivation). Insomnia and sleep deprivation are reported as common

symptoms, consequences, or comorbidities of pre-established anxiety disorders, including

generalized anxiety disorder, post-traumatic stress disorder, panic disorder, obsessive–

compulsive disorder, and depression (87-90).

Long working hours have also been associated with elevated salivary cortisol levels (91),

which may be related to the development of depression (92). Studies have shown evidence that

the effects of long working hours differ by sex (79, 82, 86). In my study, I identified that females

working more than 24 hours were more likely to be trafficked in the sectors of sex work, forced

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marriage, entertainment, and dancing; to be children and adolescents; and to be deceived into trafficking.

For males, those working more than 10 or more than 24 hours per day were exploited in the sectors of livestock, meat packing and preparation, agriculture, and fishing. Such long hours could explain the extremely elevated prevalence of PTSD among males as these sectors are also known to be dangerous and characterized by high levels of violence towards workers (85). For both females and males, deception into trafficking and preying on the vulnerable, including children and youth, constitute a central element of human slavery.

In terms of legal and economic insecurity conditions, I found that males who kept their identity or travel documents or received some monetary compensation had a greater prevalence of anxiety and depression. Similarly, being in a detention center or jail in the destination country of exploitation was an important risk factor for anxiety, PTSD, and depression in men and boys.

Usually traffickers tend to retain the documentation of trafficked individuals and do not provide any monetary compensation. This is a common strategy to control and dominate the trafficked person. Therefore, my finding of a higher prevalence of anxiety and depression among males that received some monetary compensation and had their documentation was unexpected but consistent with previous analyses of these data focused on males trafficked for fishing, manufacturing, and begging (7).

The findings might be explained by the fact that trafficked individuals often have large financial debts, thus, being monetarily compensated might provide some sense of autonomy but it may also facilitate the violence and abuse of enslaved individuals (24, 93, 94). A report of the STEAM showed that more than 45.0% of enslaved individuals reported not leaving the trafficking situation because they were making some money (95). However, those in forced labor

that received payments are often extorted and forced to pay extra money for their accommodations and food or charged for "mistakes" while working or when they are ill (85). Exploited workers are also grossly underpaid below the minimum wage standard for the number of hours worked (6, 7, 85, 96). Thus, receiving payments while being trafficked does not necessarily reduce the risk of suffering adverse events and poor mental health.

Whether legal status had a protective or negative impact may vary between sectors of exploitation (7, 85) but further research is needed in this area. Previous research on the Mekong sub-region indicates that unregistered migrants in agriculture reported more constraints to prevent them leaving their workplace than registered migrants, while the opposite was true in the fishing industry due to the fact that even though they were registered they could not gain access to their documents (85). Lack of access to personal documents means that, often, exploited workers are bonded to the labor conditions (85, 96). My findings suggest that legal documentation does not equal protection in the workplace for trafficked individuals.

It was previously reported that, for females, suffering from physical and sexual violence was a strong predictor of symptoms of anxiety, PTSD, and depression (97). Therefore, it is plausible that even among those females that have their travel documents or received some monetary compensation, the experience of violence is more relevant and powerful for their well-being and mental health. Another possible explanation is that females were trafficked in sectors, such as forced marriage or domestic work, that allow perpetrators to keep them captive or isolated from any source of information, material aid, or emotional support. In this case, receiving payments or having their personal documentation may not be protective. Losing connection with the external world is a powerful method used by traffickers to achieve complete control and create a bond of dominance with the enslaved individual (24, 25, 98).

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My finding of deleterious mental health outcomes in men and boys placed in detention centers or jails, which are common sites of human right abuses, is consistent with previous literature on migrants, refugees, and asylum seekers (10, 99-101). Research indicates that length of detention, especially for forced migrants, is associated with anxiety, PTSD, and depression (102-105). Detention centers and jails tend to be overcrowded, unsanitary, and lack basic standards for living conditions including food and adequate shelter. Detention centers and jails are also characterized by unsafe conditions that include violence, aggression, and even torture (106). In sum, the detention of already-traumatized enslaved individuals constitutes a double jeopardy for their mental well-being, but further research is warranted.

The present study has some limitations. Assessment of mental health symptoms was conducted with screening instruments with robust psychometric properties; these instruments are commonly used in general populations in some of the study countries and in post-trafficking services. However, these instruments are not gold-standard diagnostic tools to clinically assess these disorders and have not been validated in this study population. Thus, overestimation of the prevalence ratio of mental health outcomes is possible. The study population represents a sample of trafficking survivors using post-trafficking services. Most of the trafficked individuals in the STEAM escaped the trafficking situation through the intervention of police, border guards, or government officers. People in post-trafficking services thus represent a small segment of trafficked individuals. Therefore, I likely missed individuals under the most severe forms of slavery or those who are difficult to reach due to the sector of exploitation (e.g., fishing or domestic work), who potentially have worse mental health and may be less likely to be reached in post-trafficking services. In this case, prevalence ratio estimates will be underestimates.

Service eligibility and screening processes for referral to post-trafficking services may vary between countries as human trafficking is often defined according to the legal framework of the country. The results of the study may not be generalizable to the broader population of trafficked individuals. However, they are likely to be representative of trafficked individuals in similar forced labor conditions in the countries in question.

My study has important implications. I found that adverse living, working, and legal and economic insecurity conditions have negative impacts on the mental health of female and male trafficking survivors. Yet to date, these contextual factors that are embedded in the trafficking experience have received limited attention. Conditions that surround the trafficking experience should be routinely assessed and considered when providing mental health services to trafficking survivors. By the same token, clinicians, researchers, stakeholders, and policy makers need to consider that forced labor affects females and males of all ages and across a wide range of sectors of exploitation with different consequences for their mental health and well-being. This is an important and overlooked issue. Currently, most anti-slavery efforts focus on sex-trafficking. Sex trafficking is important and brutal, but the many other forms of exploitive globalized labor in which women, men, youth, and children of both sexes are exploited should not be neglected.

Monitoring of working conditions, particularly in sectors that are known to be sources of forced labor (e.g., sex work, fishing, domestic work, agriculture, construction, and brides among others) needs to be enforced. International and country-level legal procedures and policies could enforce stricter provisions and occupational regulatory standards to protect workers and prevent and eliminate forced labor.

At a policy level, a unified global action is essential that involves within- and between-country responses by stakeholders (e.g., governments, international and legal organizations, and

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advocacy groups) at various levels along with an enforced international human rights legal framework that promotes prevention, protection, and prosecution and acknowledges the importance of health in the trafficked or at-risk populations.

Coordinated multi-level approaches that offer mental and physical health, social services, safety, housing, legal counsel, economic aid, and community and societal reintegration need to ensure the protection of enslaved individuals and their families or relatives. This is an important element in the fight against trafficking. Similarly, the mental health needs of formerly enslaved individuals should be considered in the short- and long- term by assistance programs, treatment interventions, criminal procedures, and anti-slavery policies. This is imperative to improve population health, as mental health problems are among the most important contributors to the burden of disease and disability worldwide, and labor exploitation is widespread in many labor sectors that form part of the forced-labor system at large (32).

In conclusion, human trafficking is a complex problem driven by social, economic, and gender inequality; poverty; corruption; discrimination; political corruption; conflicts; wars; and social displacements. The task of addressing human trafficking is challenging and enormous but not impossible. Lessons learned from the discussions, research, and policy actions on global health equity presented by the World Health Organization and the Commission on the Social Determinants of Health (e.g., improving gender health equity, fair employment and decent working conditions, access to education, and creating and strengthening social protection systems and policies) could be early steps to address some of the structural layers of human slavery, along with the current anti-slavery efforts of the global community (107-110). Yet, despite the fact that human slavery has tremendous public health implications, forced labor has

not been at the center of the public health agenda, and funding to support research in this area is limited.

Forced labor is inhumane and a prevalent crime worldwide that affects children, women, and men of all ages. Lack of public awareness of the severity and existence of this crime, insufficient or non-enforced legal actions, and a public demand for cheap goods and services produced by enslaved individuals have all contributed to forced labor. Urgent global action and population-based approaches are needed to develop and integrate effective mental health interventions into human trafficking to address the mental health needs of people affected by slavery and improve their quality of life.

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Chapter 4

Patterns of Violence and Coercion, a Latent Class Analysis Approach (Aim 3)

Introduction

Human trafficking is a crime that incorporates numerous forms of severe physical, sexual, and psychological violence that may present life-threatening health risks (1, 2). Globally, 28.7 million (71%) of trafficked persons are women and girls and 11.6 million (28.9%) are men and boys (3). Scholars and experts have argued that violence (physical, sexual, or both) and coercion (personal or family threats) are at the center of human exploitation (4-7) but that their manifestations have different patterns or configurations in females and males (8). Survivors of trafficking report experiencing multiple simultaneous traumatic events (e.g., sexual and physical violence as well as threats) (1, 8, 9), the combination of which may have important implications for research, health assessments, and trauma-focused mental health treatments. Thus, gaining a better understanding of the varying ways in which females and males experience violence and coercion while being under forced labor is critical.

Previous research on trafficking indicates a high prevalence of violence in females ranging from 60% in the Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM) to 90% in a multi-country European survey (1, 10). Violence was reported by almost one third of the men included in a United Kingdom case records study (11) and by almost half of men (49.3%) in STEAM (1). The prevalence of personal and family threats among trafficked people is reported to be approximately 50%, irrespective of sex (1, 9). In a study of

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health consequences of women and adolescents trafficked in Europe, 80% of women who reported being threatened confirmed that threats were indeed executed by their perpetrators (9).

Earlier findings on trafficked females and males in the STEAM indicated that violence and threats during trafficking have important implications for mental health (8). For females, experiencing physical and sexual violence was a strong predictor of symptoms of anxiety, post-traumatic stress disorder (PTSD), and depression. In contrast, for males, physical violence with threats made with weapons was strongly associated with symptoms of PTSD. Psychological abuse in the form of coercion (both personal and family threats) during the trafficking experience was associated with anxiety, depression, and PTSD in both females and males (8). Given the heterogeneity of experiences of violence and coercion of trafficked individuals along with the distinct demographic profile and sectors of exploitation of trafficked men and women, identification of subgroups of individuals who experienced specific combinations and severity of threats and violence would further understanding of the complex, multi-dimensional patterns of violent acts experienced by trafficking survivors.

This study adds to existing research in various ways. First, I model violence and coercion as a multi-dimensional experience that includes the sex-specific patterning of a range of violent behaviors and coercion. Second, I examine the association of the emergent profiles of violence and coercion with each mental health outcome (anxiety, PTSD, and depression) for females and males. No previous research to date has examined the latent profiles of violence and coercion in a diverse population of female and male trafficking survivors.

Methods

Data Source, Study Design, and Study Sample

I conducted a cross-sectional analysis using data from the STEAM (1). The study methodology has been published elsewhere (1). The STEAM interviewed 1,102 participants, 87 of whom were excluded as they were identified prior to reaching the destination country of exploitation. Thus, this cross-sectional study included 1,015 trafficking survivors: males, females, youth, and children (aged 10–17 years) who attended post-trafficking assistance services in Cambodia, Thailand, and Vietnam.

Sample Design

A two-stage sampling strategy was used to identify individuals using post-trafficking services. Selected post-trafficking support services in Cambodia, Thailand and Vietnam were determined based on diversity of clientele (e.g., age, sex, sector of exploitation, and country of origin), service relationship with International Office of Migration (IOM) country teams, and agreements with government agencies (e.g., support, referral, and service arrangements). The STEAM included individuals who received post-trafficking services, regardless of differing legal definitions of trafficking and service eligibility criteria between countries (1). Individuals in the sample were identified as trafficked by the local governmental and nongovernmental referral networks and post-trafficking service providers.

A consecutive sample of individuals were then invited to participate in a structured interview after providing informed consent. The interviews took place within 2 weeks of admission to the post-trafficking services during the period between 2011 and 2013. Individuals

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were recruited only if the on-site trained case or social worker determined that their participation would not cause harm to their well-being. The response rate for the baseline survey was 98%.

Data Collection and Survey Questionnaire

Interviewers (caseworkers or social workers) from the agencies providing post-trafficking services received an intense one-week training provided by one of the principal investigators of the STEAM (LK) in collaboration with the International Organization for Migration partners in each country. Ethical provisions were implemented to ensure that participation was voluntary and confidential, to assure participants that declining participation would not affect the provision of support services. To avoid and manage distress, an offer was made of options for supported referral for health or other reported problems. Data collection and double data entry were coordinated by IOM country offices, with oversight by the London School of Hygiene and Tropical Medicine (LSHTM).

The survey questionnaire was developed based on an instrument used in a previous European study on health and sex trafficking (9). The questionnaire was adapted for the different study populations and the regions by the study team, with input from the study interviewers. The questionnaire asked about sociodemographic characteristics, pre-trafficking and post-trafficking exposures including violence and coercion, and mental health outcomes.

The instrument was translated into Khmer, Thai, Vietnamese, and Lao in multiple steps: professional translation from English to other languages, a group translation-discussion process with IOM counter-trafficking teams, pilot-testing, and review after back-translation into English. Interviewers were case or social workers from the agencies offering post-trafficking services.

Ethics

     Ethical approval for the study was granted by the LSHTM and by the National Ethics Committee for Health Research in Cambodia, the Hanoi School of Public Health in Vietnam, and the Ministry of Social Development and Human Security in Thailand. A strict ethical and safety protocol was implemented based on the *World Health Organization (WHO) Ethical and Safety Recommendations for Interviewing Trafficked Women* (12). The secondary analysis has been approved by the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board, eResearch ID: HUM00097096.

Specific Measures

     Anxiety, depression, and post-traumatic stress disorder measures. Anxiety and depression symptoms in the past week were measured by the Hopkins Symptom Checklist-25 (HSCL-25), a validated and widely used screening instrument (13). It consists of 25 items: 10 items for anxiety symptoms and 15 items for depression symptoms. The scale for each question includes four categories of response ("Not at all," "A little," "Quite a bit," and "Extremely," rated 1 to 4, respectively). Two scores are calculated: the anxiety score is the average of all 10 anxiety items, while the depression score is the average of the 15 depression items. The depression score is correlated with major depression as defined by the *Diagnostic and Statistical Manual of the American Psychiatric Association*, 4th edition (*DSM-IV*) in several populations (13, 14). A cutoff of 1.625 was used to identify symptoms of depression after item 12 in the questionnaire (sexual interest) was excluded, given the characteristics of the population in the study. For anxiety "symptomatic anxiety" was defined according to the conventional international cutoff score of 1.75. This decision was also based on previous research on

individuals using post-trafficking services and studies of Cambodian, Laotian, and Vietnamese refugees for whom this instrument has been validated (11, 15-17).

PTSD symptoms in the past week were measured using the validated Harvard Trauma Questionnaire part IV, which includes 27 trauma symptoms (18). The first 16 items were derived from the *DSM-IV* criteria for PTSD and assess the presence of the main PTSD symptom clusters: intrusive experiencing, avoidance behaviors, hypervigilance, and emotional numbing (14). The rest of the items are described by the authors as refugee-specific symptoms of trauma. These symptom items focus on the impact of trauma on an individual's perception of his or her ability to function in everyday life (e.g., poor memory or having difficulty dealing with new situations) (13, 18). Each question has four response categories: "Not at all," "A little," "Quite a bit," and "Extremely," rated 1 to 4, respectively. A total score was calculated by averaging the 27 items. A cutoff of 2.0 was used to assess symptoms of PTSD based on previous research on trafficked individuals accessing post-trafficking services (1, 10, 19).

Violence and coercion measures and covariates. To assess physical and sexual violence, validated questions from the World Health Organization (WHO) International Study on Women's Health and Domestic Violence were used (20). While these questions were not validated in the study population, they involved violent acts that are commonly reported by trafficked individuals in post- trafficking services and shelters (1, 6, 11, 19). Participants were asked whether, while being trafficked, anyone had committed any of the following acts against them (ye or no):

1. Slapped you or threw something at you that could hurt you

2. Pushed or shoved you

3. Hit you with a fist or with something else that could hurt you

4. Kicked, dragged, or beat you up

5. Tied or chained you

6. Choked you on purpose

7. Burned you on purpose

8. Released a dog to bite or scratch you

9. Forced you to have sex

10. Threatened to use a gun, knife, or other weapon against you

11. Used a knife to cut you

12. Shot a gun at you

Two additional questions were used to assess emotional or psychological abuse during the trafficked period: (a) "While you were in this situation, did anyone threaten to hurt you?" (yes or no), and (b) "During this time did anyone threaten to hurt your family or someone you care about?" (yes or no). These questions assess coercion, which is considered a hallmark of the trafficking experience, and are frequently used in studies of interpersonal violence (1, 5, 9, 21).

Statistical Analysis

I calculated frequencies and conducted bivariate analyses with cross tabulations using Rao-Scott chi-square tests to assess associations between indicators of violence and threats and anxiety, depression, and PTSD status among females and males while accounting for clustering sampling in the data using the post-trafficking services as the cluster variable. I conducted separate analyses for females and males because of their differing types and patterns of exposure to violence and coercion (8). Sex differences were also assessed by testing the association of sex with each of the individual indicators of violence and coercion.

I used a person-centered statistical framework using mixture modeling to explain population heterogeneity by identifying latent (unobserved) population subgroups inferred from the observed variables of violence and coercion (22-24). I used latent class analysis (LCA) modeling to identify latent classes of participants with distinct patterns of violence, abuse, and coercion. The goal was to identify the smallest number of latent classes that described meaningful patterns in the observed categorical indicators of violence and coercion. I examined nine and seven dichotomous indicators for females and males, respectively. I excluded indicator variables with small sample sizes (< 30) to avoid convergence problems in the models. LCA parameters were estimated by maximum likelihood using an expectation-maximization (EM) procedure. Missing data on the latent class indicators were handled by this procedure, with data assumed to be missing at random (24).

To fit the LCA model, I started with a one-class model and proceeded to test models including up to four classes. The model goodness of fit was assessed using the following information criteria: (a) Akaike information criterion (AIC), (b) Schwarz's Bayesian information criterion (BIC), (c) the sample-size-adjusted BIC, and (d) consistent Akaike information criterion (CAIC). Further, I assessed the entropy of each model, an aggregate index of posterior probabilities which is used as an indicator of the quality of the class separation. Thus, entropy reflects overall precision of the model to correctly classify subjects (25).

Model fit was also examined using the average posterior probability of class membership for respondents assigned to their most likely class. Item response plots were employed to assess the patterns of conditional violence and coercion item-response probabilities and determine which items differentiate the latent classes. The Vuong-Lo-Mendell-Rubin adjusted likelihood ratio test was used to compare the model with k latent classes to the k-1 class solution; statistical

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significance ($p < 0.05$) suggests the k class model is a better fit than k-1 classes (24). Theory-driven information was considered in the interpretability and selection of the final latent class models for females and males. In sum, models were examined for fit, parsimony, interpretability, and separation of classes.

I also used a mixture regression analysis with the approach of Bolck, Croon, and Hagenaar, known as BCH, for categorical outcomes (26, 27), using separate models for females and males and accounting for clustering in the data. I employed the BCH fitting approach, which allowed me to estimate the relationship of a latent class variable with a distal outcome not included in the model. This let me to retain "independence" between the formation of classes and the variable of interest (28). The BCH statistical approach involves three main analytical steps. In the first step, the parameters of the LCA model are estimated without the distal outcome. Second, the posterior probabilities of class membership based on this model are used to compute BCH weights for further analysis. This analytical technique was employed to overcome the problem of using the posterior probabilities directly as weights or rounding the highest probability for each subject without further adjustment (28). In this way, the adjusted BCH procedure accounts for the uncertainty introduced by possible misclassification when estimating the model parameters and provides a more robust model. Third, the calculated BCH weights were used to regress the binary distal outcomes (anxiety, PTSD, and depression) on latent class membership and compare the classes in terms of the probability of each outcome.

Clustering in the data related to the sampling strategy (participants were identified within post-trafficking service centers) was managed by correcting the standard errors and chi-square tests of model fit using the TYPE= COMPLEX analytical option and the CLUSTER option within the M*plus* software. Robust standard errors were computed using the sandwich variance

estimator that accounts for the level of correlation of observations within a cluster and produces

standard errors of the estimates accordingly. These models were fitted to each of the outcome

variables (anxiety, PTSD, depression) separately for females and males. Descriptive analyses

were conducted using the survey procedures (PROC SURVEYFREQ) with a cluster and chisq

statement in SAS version 9.4 (SAS Institute, Inc., Cary, NC), and inferential analyses were

performed with M*plus* version 8.0 (24).

Results

Sample Characteristics of Females and Males

Table 4-1 presents the prevalence of violence, abuse, and coercion experienced by

survivors of trafficking, by sex. A total of 569 (56.1%) females and 446 (43.9%) males

participated in the study. Males were more likely to be exposed to different degrees of physical

violence and aggression such as being slapped (36.6%); pushed or shoved (35.7%); kicked,

dragged or beaten up (25.1%); hit (32.1%); burned (1.4%); exposed to a dog released to bite or

scratch (1.8%); being threatened with a weapon or knife (23.1%); receiving cuts with a knife

(5.6%); and shot with a gun (2.9%). In contrast, females were more likely than males to suffer

from sexual violence (35.0%), being tied or chained (3.5%), and being choked on purpose

(5.3%). Coercion in the form of personal threats was more common in men and boys (46.2%)

while receiving both personal and family threats was more prevalent in females (14.6%).

Latent Class Models for Females and Males

Table 4-2 presents the fit indices for the two class models selected for females and males.

Even though fit indices were smaller for class three, high entropy in females (0.94) and males

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(0.91), consideration of the Vuong-Lo-Mendell Rubin likelihood ratio test, item response plots,

and theory suggested that the more parsimonious two class models were more appropriate.

Table 4-1 Prevalence of violence and abuse of formerly trafficked individuals by sex: The Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM), n = 1,105

Binary indicators of violence	Females n (%)[f]	Males n (%)
Total	569 (56.1)	446 (43.9)
Slapped you or threw something at you that could hurt you[a]		
Yes	125 (22.0)	163 (36.6)
Pushed or shoved you		
Yes	106 (18.6)	159 (35.7)
Hit you with a fist or with something else that could hurt you		
Yes	84 (14.8)	143 (32.1)
Kicked, dragged, or beat you up[a]		
Yes	87 (15.3)	112 (25.1)
Tied or chained you[a]		
Yes	20 (3.5)	6 (1.4)
Choked you on purpose[a]		
Yes	30 (5.3)	24 (5.4)
Burned you on purpose[a]		
Yes	3 (0.5)	6 (1.4)
Released a dog to bite or scratch you[b]		
Yes	3 (0.5)	8 (1.8)
Forced you to have sex[c]		
Yes	198 (35.0)	6 (1.4)
Threatened to use a gun, knife, or other weapon against you[b]		
Yes	53 (9.4)	103 (23.1)
Used a knife to cut you[d]		
Yes	14 (2.5)	25 (5.6)
Shot a gun at you[e]		
Yes	1 (0.2)	13 (2.9)
Receiving threats during trafficking		
None	345 (60.6)	192 (43.1)
Personal threats	141 (24.8)	206 (46.2)
Both, personal and family threats	83 (14.6)	48 (10.8)

[a] 1 missing for females.
[b] 2 missing for females.
[c] 3 missing for females & 3 missing for males.
[d] 1 missing for females
[e] 1 missing for females
[f] Column percentages.

Table 4-2 Fit indices of a two latent class analysis models of violence and coercion among trafficking survivors female (n = 569) and males (n = 446)

Index	Females			Males		
	2 classes	3 classes	4 classes	2 classes	3 classes	4 classes
Log-likelihood:	-1787.433	-1726.321	-1712.063	-1403.929	-1366.058	-1351.498
AIC	3616.867	3516.641	3510.127	2841.858	2784.117	2772.997
BIC	3708.088	3655.645	3696.914	2911.563	2890.725	2916.508
Adjusted BIC	3641.423	3554.060	3560.408	2857.612	2808.2120	2805.4330
Entropy	0.94	0.83	0.76	0.91	0.82	0.87
Vuong-Lo-Mendell Rubin likelihood ratio test (p-value)	0.07	0.42	0.72	0.12	0.40	0.55

Figure 4-1 and Figure 4-2 display item-response plots to describe the probability of response to each of the indicators of violence and coercion and to discern which items in particular differentiate the latent classes. For females, salient features of violence and abuse were sexual violence, coercion, and physical aggression in the form of being slapped, having something thrown at the body with intent to hurt, or being pushed or shoved, hit, kicked, dragged, or beaten up. In contrast, among males, being slapped, having something thrown at the body with intent to hurt, being pushed, shoved, hit, or kicked, receiving threats from weapons, and receiving personal threats were common patterns of violence.

Table A-1 and Table A-2 in the Appendix show a three-latent-class-probabilities solution to further illustrate that two classes described the data better.

Patterns of violence and coercion in trafficking survivor females and males. Table 4-3 and Table 4-4 display conditional probabilities of violent acts and coercion within the given two latent classes with their standard errors, as well as latent class probabilities that show the prevalence of specific patterns of violence and coercion within the sampled population of female and male survivors of trafficking.
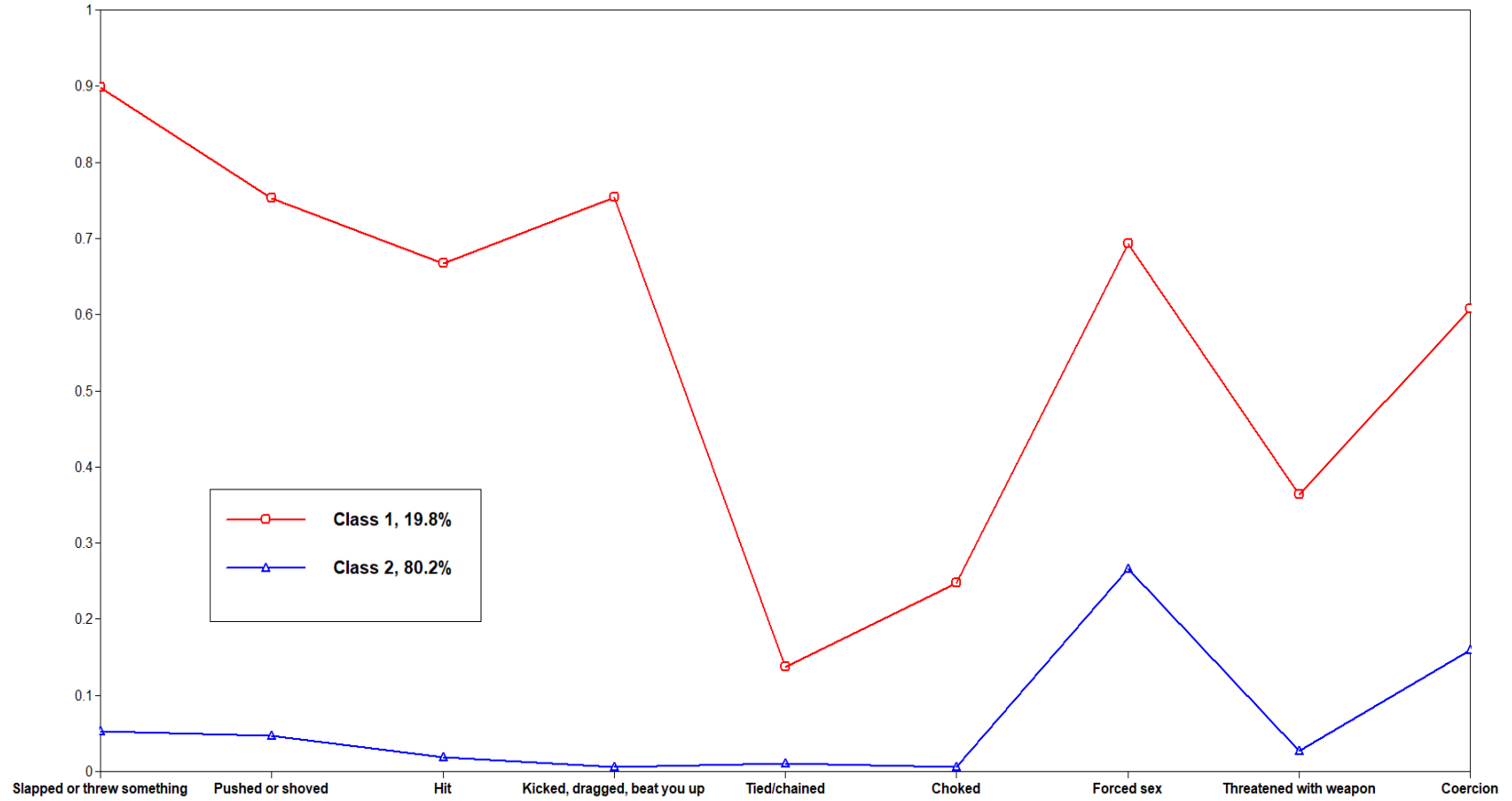
Figure 4-1. Violence and coercion patterns in females: Item probabilities for the two classes
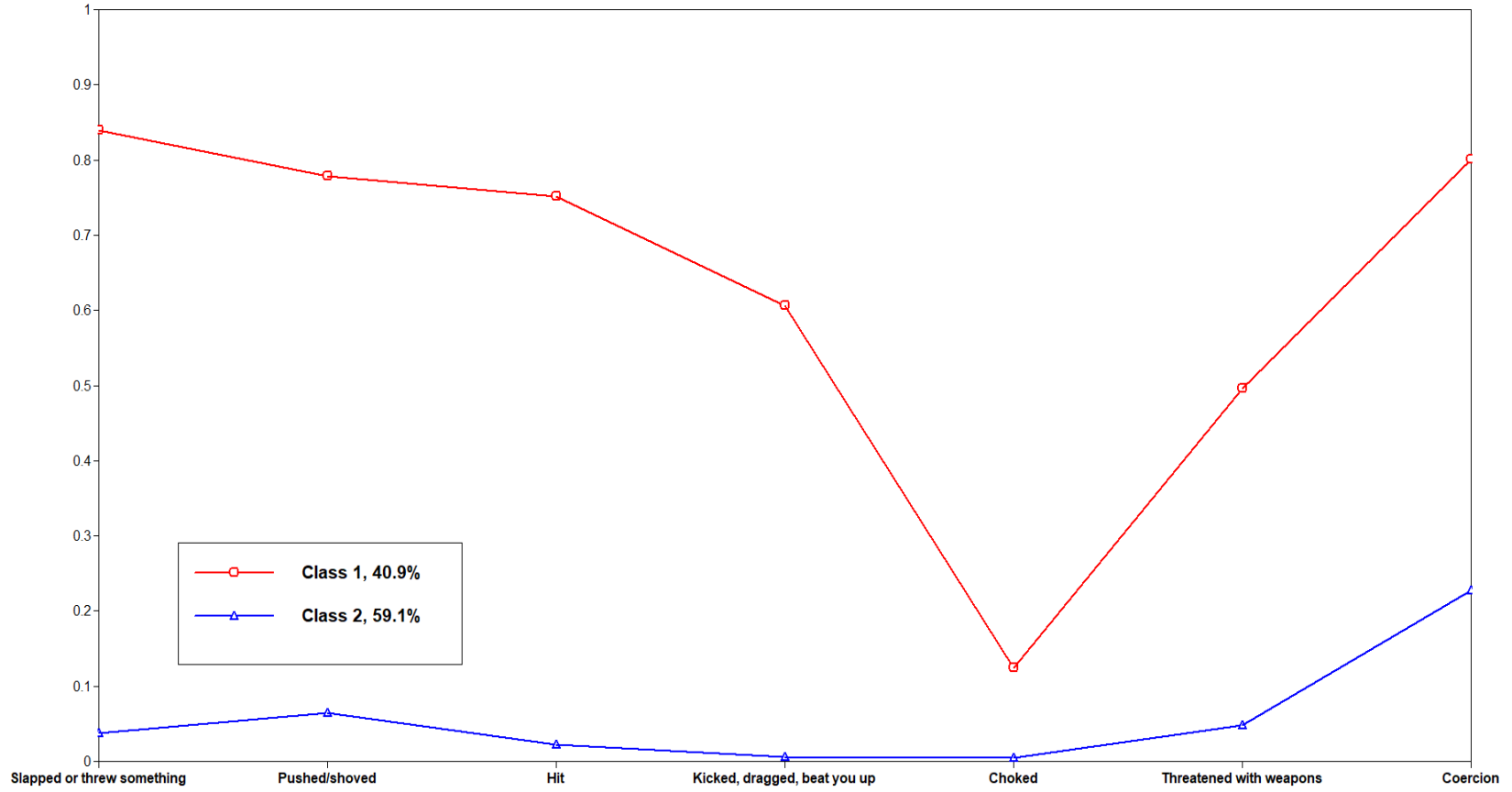
Figure 4-2. Violence and coercion patterns in males: Item probabilities for the two classes

Table 4-3 Two-class model of violence and abuse of formerly trafficked females (n = 569)

	Class I Severe sexual and physical violence and coercion		Class II Sexual violence and coercion	
Latent class prevalence based on the estimated model	0.20		0.80	
	Item-response probability	se[a]	Item- response probability	se
Violence and coercion indicators				
Slapped you or threw something at you that could hurt you	0.90	0.06	0.05	0.03
Pushed or shoved you	0.75	0.09	0.05	0.02
Hit you with a fist or with something else that could hurt you	0.67	0.10	0.02	0.01
Kicked, dragged, or beat you up	0.75	0.09	0.01	0.005
Tied or chained you	0.14	0.03	0.01	0.007
Choked you on purpose	0.25	0.04	0.005	0.006
Forced you to have sex	0.69	0.15	0.27	0.10
Threatened to use a gun, knife, or other weapon against you	0.36	0.05	0.03	0.01
Receiving threats during trafficking				
Personal threats	0.61	0.07	0.16	0.03
Both, personal and family threats	0.31	0.09	0.10	0.06

[a] Standard error.

For females, the two-class solution was defined based on previous knowledge of survivors of trafficking and characterized as "severe sexual and physical violence, and coercion" (class I) that characterized 20.0% of women and girls and a pattern of "sexual violence and coercion" (class II) that defined 80.0% of the sampled female population. Females in the severe violent class experienced high probabilities (≥ 60.0%) of exposure to a wide range of acts of

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physical violence (e.g., being slapped, pushed or shoved, choked, or tied), sexual violence

(69%), threats with weapons (36.0%), and coercion (61% for personal threats and 31% for both

personal and family threats). While the pattern of sexual violence and coercion (class II) was

experienced by the vast majority of females (80.0%), it involved a relatively lower likelihood of

sexual violence (27.0%) and coercion, personal (16.0%) and both personal and family threats

(10%).

Table 4-4 Two-class model of violence and abuse of formerly trafficked males (n = 446)

	Class I Severe physical violence and coercion		Class II Personal coercion	
Latent class prevalence based on the estimated model	0.41		0.59	
	Item-response probability	se[a]	Item-response probability	se
Violence and abuse items				
Slapped you or threw something at you that could hurt you	0.84	0.04	0.04	0.04
Pushed or shoved you	0.78	0.05	0.07	0.05
Hit you with a fist or with something else that could hurt you	0.75	0.03	0.02	0.01
Kicked, dragged, or beat you up	0.61	0.03	0.006	0.01
Choked you on purpose	0.13	0.01	0.005	0.01
Threatened to use a gun, knife, or other weapon against you	0.50	0.04	0.05	0.05
Receiving threats during trafficking				
Personal threats	0.80	0.04	0.23	0.10
Both, personal and family threats	0.13	0.03	0.09	0.06

[a] Standard error.

The patterns of violence that characterized the trafficked male population were defined

by "severe physical violence and coercion" (class I, 41.0%) and "personal coercion" (class II,

59.0%). For men and boys classified as exposed to severe physical violence and coercion (class I), more than 60% had a high likelihood of reporting severe acts of physical violence (e.g., being slapped, pushed or shoved, kicked, dragged, or beaten up), threats with weapons (50.0%), and personal threats (80.0%). In contrast, only 10% of men and boys were classified as being personally coerced (class II).

Test of prevalence equality for the distal mental health outcomes (anxiety, PTSD, and depression) across latent classes in females and males using the BCH procedure. Figure 4-3 illustrates the mixture diagram model exemplifying the association of the binary latent classes indicators with the binary outcomes (anxiety, PTSD, depression).

Table 4-5 and Table 4-6 show the tests of prevalence equality for each of the distal outcomes and latent class membership for females and males. More than half of the sample of females in the "severe sexual and physical violence and coercion" class had anxiety (55.0%) and depression (79.0%). Similarly, 48.0% of women and girls in this class had PTSD. The vast majority of females classified as exposed to "sexual violence and coercion" (61.0%) had depression and about a third each had symptoms of anxiety (37.0%) and PTSD (31.0%). There were statistically significant differences in the probability of the outcomes between the classes in females.

Almost half of the males in the "severe physical violence and coercion" class suffered from anxiety (48.0%) and PTSD (46.0%), and more than half of males (59.0%) classified in this class had depression. Among males classified as being exposed to "personal coercion," approximately 45% had anxiety, 39% had PTSD symptoms, and 56% had depression. There were no statistically significant differences between the classes and across each of the mental health outcomes.
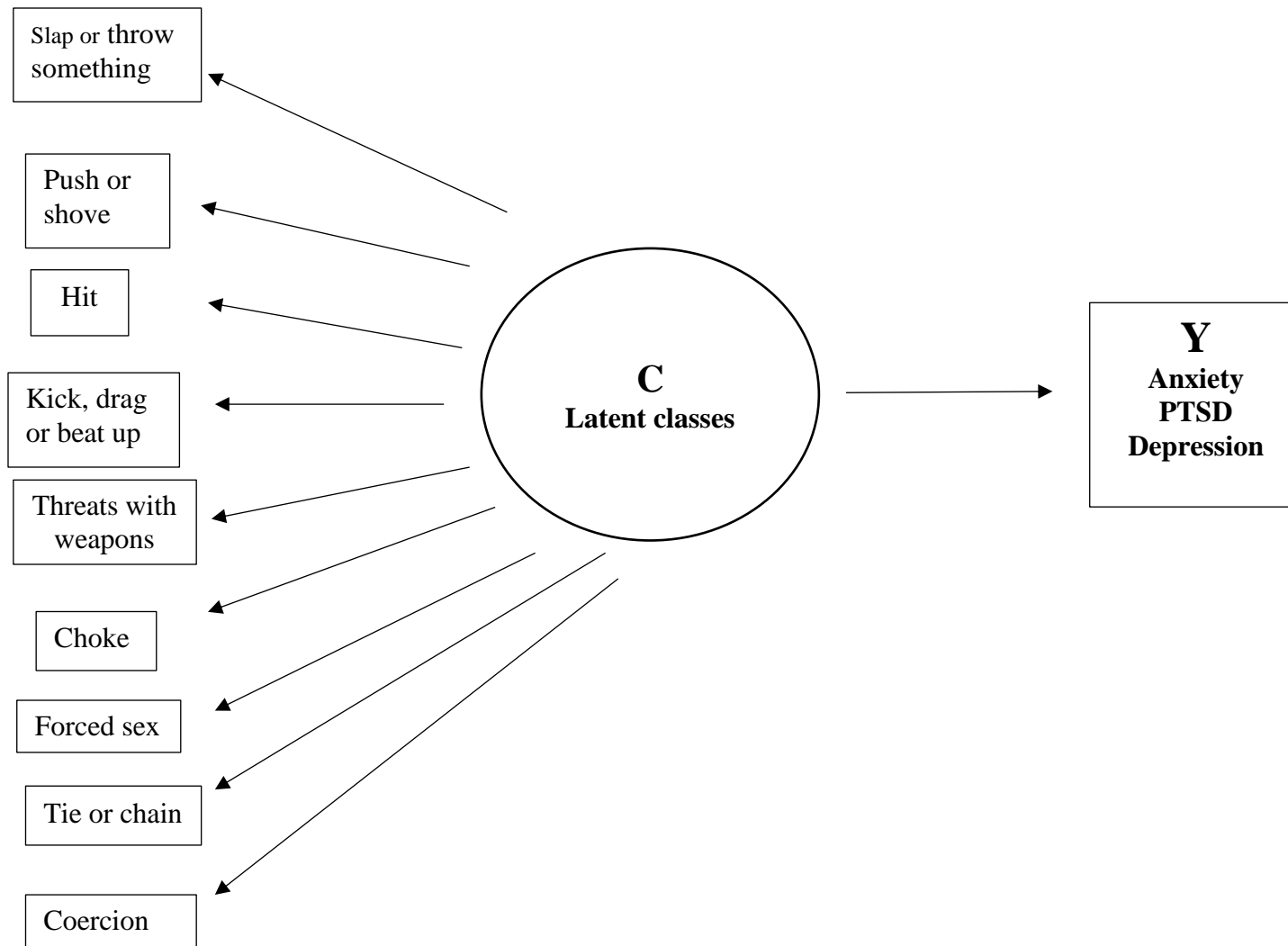
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Figure 4-3. Finite mixture model diagram with binary latent class indicators of violence and binary outcomes: anxiety, PTSD, and depression. The arrow from C to Y (binary dependent variable) indicates that the intercept of Y varies across the classes of C. This corresponds to the logistic regression of Y on C classes.

Table 4-5 Tests of prevalence equality for the distal mental health outcomes (anxiety, depression, and PTSD) across latent classes in females using the BCH procedure (n = 569)

	Anxiety		PTSD		Depression	
	%	se[a]	%	se	%	se
Severe sexual and physical violence and coercion (class 1)	55.0	6.0	48.0	0.10	79.0	0.08
Sexual violence and coercion (class 2)	37.0	6.0	31.0	0.07	61.0	0.03
Overall chi-square (class 1 vs. class 2), p-value	$\chi^2 = 26.33$, $p < 0.0001$		$\chi^2 = 4.03$ $p = 0.05$		$\chi^2 = 3.87$ $p = 0.05$	

[a] Standard error.

Table 4-6 Tests of prevalence equality for the distal mental health outcomes (anxiety, PTSD, and depression) across latent classes in males using the BCH procedure (n = 446)

	Anxiety		PTSD		Depression	
	%	se[a]	%	se	%	se
Severe physical violence and coercion (class 1)	48.0	0.17	46.0	0.15	59.0	0.17
Personal coercion (class 2)	45.0	0.11	39.0	0.12	56.0	0.10
Overall chi-square (class 1 vs. class 2), p-value	$\chi^2 = 0.03$ $p = 0.86$		$\chi^2 = 0.12$ $p = 0.73$		$\chi^2 = 0.02$ $p = 0.88$	

[a] Standard error.

Mixture modeling using the BCH method to estimate the association of the latent classes and the distal outcomes (anxiety, PTSD, and depression) for females and males. Table 4-7 displays the finite mixture model for the gender-specific associations between latent class membership and each of the mental health symptoms.

Females exposed to severe violence (including physical and sexual violence) and coercion had a twofold increase in the odds of anxiety (OR = 2.10; 95% CI: 1.57–2.81) and PTSD (OR = 2.07; 95% CI: 1.03–4.17) when compared to females exposed to sexual violence and coercion (personal and family threats). While the odds of depression were also elevated for females, the association was marginally significant (OR = 2.48; 95% CI: 0.85–7.25). Males exposed to severe physical violence and coercion had higher odds of PTSD (OR = 1.35; 95% CI: 0.25–7.33) and depression (OR = 1.14; 95% CI: 0.21–6.28) relative to males exposed to personal

coercion, but the associations did not differ. Likewise, the odds of anxiety in males and severe physical violence and coercion were not statistically associated.

Table 4-7 Estimated mixture logistic regression analyses of the latent classes and each of the mental health outcomes using a BCH procedure

	Anxiety		PTSD		Depression	
	OR	95% CI	OR	95% CI	OR	95% CI
Females						
Sexual violence and coercion (reference)	1.0		1.0		1.0	
Severe sexual and physical violence and coercion	2.10	1.57-2.81	2.07	1.03-4.17	2.48	0.85-7.25
Males						
Personal coercion (reference)	1.0		1.0		1.0	
Severe physical violence and coercion	0.93	0.52-1.66	1.35	0.25-7.33	1.14	0.21-6.28

Discussion

This is the first study on human trafficking survivors to use a latent class analysis with a mixture model and BCH approach to further understanding of the complex patterns of violence and coercion experienced by females and males exploited in various labor sectors as well as their association with mental health. Consistent with the scarce sex disaggregated human trafficking research, I found that females and males experienced severe forms of violence and coercion. However, in contrast to independent measures of violence (e.g., sexual violence or physical violence only), the results of the LCA revealed a more complex picture of what constitutes violence and coercion for female and male trafficking survivors.

The study results showed a very high prevalence of depression in females who suffered from "sexual violence and coercion" and those exposed to "severe sexual and physical violence and coercion." The prevalence of anxiety and PTSD was also considerable in this class with approximately half of the females classified as being exposed to "severe sexual and physical

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violence and coercion." I also observed differences in the classes and the probability of having

anxiety, PTSD, and depressive symptoms in females. More than half of the sample of males

classified as receiving "severe physical violence and coercion" had depression (59.0%). Almost

50% of men and boys classified as suffering "severe physical violence and coercion" had anxiety

and PTSD. Anxiety,depression, and PTSD were also considerably elevated among males in the

class of "personal coercion." In both females and males, this considerable elevated prevalence

for anxiety, PTSD, and depression was similar to that reported among war-refugees and torture

survivors (29-31).

The results indicated a twofold increase in anxiety and PTSD in females classified as

being exposed to "severe sexual and physical violence and coercion" compared to females

exposed to "sexual violence and coercion." This group represented women and girls with

patterns of high levels of severe physical violence (e.g., being kicked, dragged or beaten up, tied

or chained, or choked on purpose), sexual violence, and coercion (threats with weapons, personal

threats, and both personal and family threats). The cluster of these acts tends to exacerbate poor

mental health among female trafficking survivors who had experienced this particular pattern of

violence. These findings are aligned with trauma research that reports that individuals (children,

adolescents, or adults) who experienced multiple or repeated exposure to traumatic events have

an increased risk of psychiatric morbidity, specifically symptoms of anxiety, PTSD, and

depression (32-34).

For males, the associations for PTSD and depression were elevated among those who

were exposed to "severe physical violence and coercion" but did not differ across classes,

possibly because almost half of males were classified in each of the classes. It is plausible that

differences were not detected between classes or that the pattern of violence for males is indeed

defined solely as "severe physical violence and coercion." Further research with larger sample sizes is needed as I had to exclude some categorical "violent" indicators (e.g., sexual violence, and being shot or cut) due to small numbers. Yet results showed that, besides physical violence, being threatened with weapons and experiencing personal threats were prevalent among men and boys classified in the "severe violence and threats" class. My findings also indicated differences in the patterns of coercion for females and males. Females experienced "personal threats," both "personal and family threats," and "threats with weapons" while for males, "personal threats only" and "threats with weapons" was more characteristic of their trafficking experience.

The finding that sexual violence and coercion was highly prevalent in females is not unexpected. Human trafficking is known to be highly gendered (3). As previously reported (Aim 1), females were more commonly trafficked in sex work, forced marriage, and domestic work, while males were exploited in agriculture, fishing, livestock, or construction. This finding is also consistent with the literature on gender-based violence indicating that sexual violence and coercive control are forms of violence deeply intertwined with gender inequality (35, 36).

Overall, the results are consistent with previous findings on exploitative practices in females and support the assertion that women and girls in forced labor conditions are disproportionately victimized and exposed also to sexual violence (3). Only six males in the study were exposed to sexual violence; however, sexual violence in males tends to be underreported and unrecognized (37). Future research on sexual violence in trafficked males is important, as was reported in a previous study (Aim 2) that children and adolescents tend to be trafficked for sex work (8).

The results of the study have important implications for policy, research, health assessments, and trauma-focused mental health treatments. Survivors of trafficking with complex

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patterns of violence and coercion may benefit from a more systematic coordination of care that includes evidence-based treatment approaches, medical care, or other social and legal services. Treatment should be regular and continuous and in the case of minors should be adapted according to age, circumstances, and level of development. While trauma-focused cognitive-based therapy has been suggested for the treatment of survivors of trafficking (38), more research is needed in this area.

My results also highlight the need for considering different patterns and multiple configurations of violence and coercion in females and males. This information could be valuable to, first, understand differences in treatment needs and, second, to employ targeted mental health interventions and assess which interventions would be more beneficial for specific subgroups of this population. By the same token, developing more comprehensive measures of violence and coercion rather than single dimension measures (e.g., yes or no violence) that help to capture the effects of multiple acts of violence and coercion in this population will be helpful.

Policy-makers need to consider that the experience of violence and coercion is multidimensional and its effects on mental health are complex. For instance, exposure to multiple traumatic events is associated with greater mental illness (39, 40), and the presence of comorbidity can exacerbate the burden of disease. Particularly, the manifestation of the symptomatology of anxiety, PTSD, and depression are complex as they are highly comorbid in this population, as reported previously in Aim 1 (8). This is important because comorbidity increases the chronicity of each disorder, slows recovery, and increases the likelihood of a recurrence once the patient has recovered (41-43), all of which could impact the psychosocial functioning and the quality of life of trafficking survivors.

The study has some limitations. The results of the study may not be generalizable to the broader population of trafficked individuals. The study population is a sample of survivors of trafficking using post-trafficking services. Service eligibility and screening processes for referral to post-trafficking services may vary between countries as the definition of human trafficking depends on the legal framework of each country. However, the study results are likely to be representative of trafficked individuals in similar forced-labor conditions in the countries in question as violence and threats are common features of human trafficking.

Moreover, I cannot establish the temporal relationship between violence, threats, and mental health symptoms (anxiety, PTSD, and depression) due to the cross-sectional study design. Individuals with poor mental health could be more vulnerable to being trafficked and have a history of victimization and violence. Yet previous studies on human trafficking, violence, and women's health suggest that mental health problems are more likely the result of abuse rather than its antecedents (2, 35, 44).

Mental health symptoms were assessed with screening instruments. While these instruments are commonly used in general populations in some of the study countries and in post-trafficking services, they are not diagnostic tools and they have not been validated with the study population. Thus, overestimation of the prevalence ratio of mental health outcomes is possible. However, it is also plausible that trafficked individuals under the most severe forms of slavery and captivity are the ones with worse mental health and may be less likely to be reached in post-trafficking services. In this case, my calculations of the prevalence ratio will be underestimates.

Future research is needed to assess if the latent classes observed in the study apply to other country settings with different social gender roles and norms. Longitudinal studies are

needed to evaluate the course of the effects of these forms of violence and coercion in relation to mental health over time. For instance, delayed or late onset of PTSD tends to appear at least six months after a post-trauma adjustment period in which diagnostic criteria were initially absent. This delayed form of PTSD is indicative of how a traumatic experience can apparently be contained by the individual, only to become manifest later when triggered by other stressors or following natural neurobiological progression (41). Similarly, individuals who recover from a major depressive disorder are at significantly greater risk of experiencing a recurrence. Thus, the residual and lingering effects of the traumatic trafficking experience needs to be considered in the provision of services and mental health treatment. This is particularly important for the trafficked population that faces many challenges post-trafficking (e.g., mental and physical health, social, economic, and legal) and in the reintegration phase.

In conclusion, the study addresses an important gap in the literature and demonstrates the importance of considering the patterns of violence and coercion and its effects on the mental health of female and male survivors of trafficking. These findings have potential policy, research, and clinical implications for trauma-focused mental health treatments and provision of services for survivors of trafficking.

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Chapter 5

Discussion

Summary of Dissertation Findings

The exploitation of human beings in formal and informal labor sectors (e.g., domestic work, agriculture, fishing, begging, and sex work) is part of the economic infrastructure of many countries and is a pervasive global problem. Yet, it has not achieved commensurate visibility, policy attention, or funding in public health, policy or research. Human trafficking has profound effects on the mental health of survivors of all ages (children, adolescents, and adults) and thus has important public health implications.

The present dissertation contributes to the scientific knowledge of the sex-specific impact that violence and coercion, as well as conditions embedded in the trafficking experience (living, working, and economic insecurity conditions), have on the mental health of survivors of trafficking. I have also showed the importance of more careful consideration of the complex patterns of violence and coercion and the need for more comprehensive measures to capture the combined effects of multiple acts of violence and coercion on health. Currently, there is scarce population-level research on the mental health of female and male survivors of trafficking exploited in diverse labor sectors.

In chapter 2 (Aim 1), I assessed the sex-specific associations of violence (sexual, physical, or both) and psychological coercion (personal and family threats) with anxiety, depression, and post-traumatic stress disorder (PTSD) symptoms in females and in males. For

women and girls, experiencing both physical and sexual violence was a strong predictor of symptoms of anxiety, PTSD, and depression. In contrast, physical violence with threats made with weapons was most strongly associated with symptoms of PTSD among males. Coercion in males and females was strongly related to anxiety and PTSD, in particular for females exposed to both personal and family threats.

Differences in risk were present by country and sector of exploitation. Males exploited in China had the highest risk for PTSD and depression followed by males exploited in other countries, while males exploited in Thailand had the lowest risk. For females, sector of exploitation was a stronger predictor of poor mental health than country of exploitation. Overall, females exploited in domestic work, cleaning, restaurant work, begging, and other; construction and factory work; and livestock, agriculture, and fishing, had a higher risk for anxiety and PTSD symptoms than women and girls exploited in sex work, forced marriage, entertainment, and dancing. This latter sector group also had the lowest risk for anxiety. Males exploited in the sectors of construction and factory work, livestock (including meat preparation), agriculture, and fishing, and those exploited in China and in seven other countries (Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia), had a high prevalence of PTSD and depression.

Overall, the study findings point to the importance of considering the diverse contexts of labor exploitation in females and males and the need to further understand the relationship and mechanisms that operate among different sectors of exploitation and mental health.

In chapter 3 (Aim 2), I assessed the association between living, working, and legal and economic insecurity conditions with mental health (anxiety, depression, and PTSD) among trafficking survivors exploited in various labor sectors. Results indicated that the association

between these conditions and mental health differed by sex. For females, living conditions were strongly associated with anxiety, PTSD, and depression, but for males, an even stronger association, a twofold increase between living conditions and each of the three mental health outcomes was present.

Excessive working hours during trafficking were a strong risk factor for anxiety, PTSD, and depressive symptoms for females and males. However, some sex-related work differences were observed. Excessive working hours and an indefinite number of work hours were more commonly experienced among men and boys with an elevated prevalence of anxiety, depression, and especially PTSD symptoms. Males were more commonly exploited in the sectors of livestock, meat packing and preparation, agriculture, and fishing. For women and girls, working excessive working hours and undefined hours (> 24 hours) were strongly associated with PTSD. Additionally, females working more than 24 hours were more likely to be trafficked in the sectors of sex work, forced marriage, entertainment, and dancing, be children or adolescents, and be deceived into trafficking.

In terms of the legal and economic insecurity conditions, males who have their identity or travel documents, or received some monetary compensation, had an elevated prevalence of anxiety and depression. While it would seem an unexpected result, this may mean that in this population having personal documents or receiving payments while being trafficked does not necessarily reduce the risk of suffering adverse events and poor mental health. Additionally, being in a detention center or jail in the destination country of exploitation was an important risk factor for anxiety, PTSD, and depression in men and boys. This finding is not surprising as detention centers and jails are known to have unsafe sanitary and living conditions that include violence, aggression, and even torture. In sum, the results of the study indicate the importance of

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assessing the conditions that surround the trafficking experience as I found they have a high impact on the mental health of trafficking survivors.

In chapter 4 (Aim 3), I studied the sex-specific patterns of violence and coercion in survivors of trafficking using a latent class analysis approach with finite mixture models. Two salient patterns of violence and coercion in females and males emerged. For females classified as being exposed to "severe sexual and physical violence and coercion," the prevalence for anxiety, PTSD, and depression was highly elevated, particularly for depression. For women and girls in the class defined as "sexual violence and coercion," more than half of the sample had depression and a third had symptoms of anxiety and PTSD. Statistically significant differences were present in the prevalence of the outcomes between the classes in females. For males, about half of the sample in the class "personal coercion" had anxiety and PTSD and, similar to women, depression was the highest prevalence. More than a third of the males in the class "severe physical violence and coercion" had anxiety and PTSD, while more than half of the males had depression. For the males, there were no statistically significant differences between the latent classes' prevalence and each of the mental health outcomes. Overall, females in the "severe sexual and physical violence and coercion," class had the highest prevalence for all three mental health outcomes.

The mixture logistic regression analysis of the latent classes with the mental health outcomes showed that women and girls exposed to a pattern of "severe violence and coercion" that included physical and sexual violence, and threats (personal or both personal and family), or threats with weapons, have higher odds of anxiety and PTSD symptoms compared to females exposed to "sexual violence and coercion."

The patterns of violence that characterized the trafficked male population were defined by "severe physical violence and coercion" and "personal coercion." Males exposed to "severe

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physical violence and coercion" had higher odds of PTSD and depression relative to males exposed to personal coercion; however, the associations were not statistically significant. Likewise, the odds of anxiety in males and "severe physical violence and coercion" were not statistically associated. This unexpected finding in males may indicate that their pattern of violence may be determined only as "severe physical violence and coercion," and therefore differences were not detected. Sex-specific differences were also present in patterns of coercion. The experience of coercion in women and girls was defined by "personal threats," both "personal and family threats," and "threats with weapons" while for males, only "personal threats" and "threats with weapons" was characteristic of their trafficking experience.

Considering all the sectors of exploitation, females exploited for sex work, forced marriage, entertainment, and dancing were the most affected by "severe sexual and physical violence and coercion" (15.1%) and "sexual violence and coercion" (56.9%). For males, and among all the sectors of exploitation, those trafficked in livestock, agriculture, and fishing were the ones most affected by "severe physical violence and coercion" (35.4%) and "personal threats" (31.6%).

In terms of countries of exploitation, females in China and Thailand had the highest prevalence of "sexual violence and coercion" with 27.0% and 49.0%, respectively. China had the highest percentage of females exposed to "severe sexual and physical violence and coercion" (62.5%) followed by Thailand (26.0%) and other countries (11.6%). For males, all the countries of exploitation examined showed a high prevalence of "personal coercion": China (37.2%), Thailand (27.9%), and other countries (34.9%). In men and boys "severe physical violence and coercion" was more accentuated in Thailand (59.3%) and other countries (36.7%).

Taken as a whole, the results of this dissertation highlight the fact that females are disproportionately victimized and also exposed to sexual violence. This finding is consistent with overall research on human trafficking that indicates that the experiences of violence and coercion are highly gendered, as shown by the different sectors of exploitation studied. The fact that China and Thailand had the highest prevalence of sexual violence, severe violence, and coercion in females and males may be in part a reflection of the lack of enforcement in trafficking legislation and overall lack of fair labor and protective practices for workers in general (1, 2). The Trafficking Victims Protection Act (TVPA) defined China as "tier 3" and Thailand and "other countries" (Cambodia, Malaysia, Vietnam, Indonesia, Mauritius, South Africa, and Russia) as "tier 2" with the exception of Russia classified as "tier 3."

According to the TVPA, tier 2 represents countries that do not fully reach the minimum standards of protection, prevention, and prosecution strategies but that some efforts to reach compliance have been made. Tier 3 represents countries that not only do not meet the minimum standards, but are also not making any changes in their approach to trafficking (1). These tier rankings are assigned based on enactment of laws forbidding severe forms of trafficking and criminalization of trafficking offenses (1).

Policymakers need to consider that the experience of violence and coercion is multidimensional and its impact on mental health is complex. Mental health treatment and services should be provided accordingly. I reported in Aim 1 that some participants had triple comorbidities (anxiety, depression, and PTSD), which could affect the course of the disease and its recovery and could increase the probability of recurrence of symptoms after recovery. This is particularly important for the trafficked population that faces many challenges post-trafficking (e.g., mental and physical health, social, economic, and legal) and during the reintegration phase.

Thus, the understanding of the impact of violence and coercion on mental health needs to be considered in the provision of services and during legal procedures and prosecution of traffickers.

Strengths and Limitations

A strength of this dissertation includes the unique characteristics of the data source. The STEAM is the largest health survey of children, adolescents, and adults exploited in diverse labor sectors and countries. The response rate for the Study on Trafficking, Exploitation and Abuse in the Mekong Sub-region (STEAM) survey was very high (98%) even though trafficked people are considered a hidden and hard-to-reach population. To my knowledge, this is the first study that assessed sex-specific associations of the experiences of violence and coercion, as well as conditions during trafficking, with the mental health of trafficking survivors. The study also examined patterns of violence and their association to mental health. This is an important strength as research on the mental health of trafficking survivors is limited and only descriptive studies with small sample sizes have included trafficked males. Another strength of the study was to assess how different labor sectors and countries of exploitation were associated with mental health rather than focusing only on sexual exploitation which has been the focus of the vast majority of research on human trafficking. Overall, a strength of the dissertation was its contribution to further understanding of the magnitude, severity, and nature of trafficking and to identifying those who are disproportionately affected by the trafficking experience and exploitative labor practices. Finally, I employed rigorous methodological approaches appropriate for the study design never used before in studies of human trafficking. Unlike the STEAM, I used prevalence ratios (when the prevalence of the outcome is elevated) instead of odds ratios and accounted for clustered sampling in the data to avoid bias estimates.

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The study has some limitations. The cross-sectional design does not allow me to establish causality or the temporal relationship between violence, threats, and mental health symptoms. Individuals with poor mental health could be more vulnerable to being trafficked and have previous exposures to violence. However, previous studies on human trafficking, violence and women's health suggest that mental health problems are more likely the result of trafficking rather than antecedents. Assessment of mental health symptoms was conducted with screening instruments with robust psychometric properties; these instruments are commonly used in general populations in some of the study countries and in post-trafficking services. However, these instruments are not diagnostic clinical assessments and they have not been validated with the study population. Thus, overestimation of the prevalence is plausible.

It is possible that trafficked individuals under the harshest forms of slavery and exploitation are the ones with worse mental health and may be less likely to be reached in post-trafficking services. In this case, my estimates of the prevalence ratio will be underestimates. Nonetheless, the direction and magnitude of the associations I observed are consistent with previous post-trafficking studies. The study population represents a sample of survivors of trafficking using post-trafficking services. Service eligibility and screening processes for referral to post-trafficking services may vary between countries as human trafficking is defined according to the legal framework of each country. Hence, the results of the study may not be generalizable to the broader population of trafficked individuals. However, they are likely to be representative of trafficked individuals in similar forced-labor conditions in the countries in question, as violence and coercion are known to be core components of any human trafficking situation.

An additional concern is that there were only six males reporting sexual violence in the study. However, unrecognized and underreported sexual violence in men and boys is common. Particularly, the process of disclosing sexual violence in children and adolescents is complex and is unlikely to be captured in a single question interview (3). Minors also tend not to reveal their victimization until adulthood (4) and the interpretation of the study results should be considered within this limitation. Another limitation in my study was the small sample size in some of the sectors of exploitation. I grouped some of the labor sectors differently for females and males, which limits a more in-depth analysis of the effects of sectors of exploitation. However, no human trafficking studies to date have conducted sex-disaggregated assessments with the diversity of labor sectors that I considered in the study. Similarly, for Aim 3, I was unable to use all the single categorical indicators of violence and coercion due to small sample sizes, which may limit my understanding of the clustering of patterns of violence and coercion in females and males. However, the patterns defined by latent classes are consistent with current understanding of the importance of violence and coercion in the trafficking experience. Residual confounding is also a limitation; however, the selection of confounders was theory-driven and based on previous trafficking research.

Public Health, Policy, and Clinical Implications

Modern slavery affects 40 million people (children, adolescents, and adults) of both sexes worldwide (5). Globalization and economic liberalization exacerbate human exploitation by contributing to the social, economic, and political inequities and instability in regions and countries in which forced labor is widespread in the form of human trafficking, such as Southeast Asia. Modern slavery exists in part because a range of other exploitative labor conditions are

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present, too (6). This is the overarching principle of why we should care about forced labor and this is the broader intention and implication of this dissertation.

The health burden of slavery has public health implications of a global magnitude, from violence, severe injuries, infectious diseases (e.g., HIV and other sexually transmitted diseases) and non-communicable diseases, acute and chronic mental and physical health illnesses, and reproductive health problems (e.g., unsafe abortions and chronic pelvic pain), among others (2, 7-10). Given that trafficking can affect many areas of health, public health has an important role in addressing human trafficking.

At the core of public health lies the goals of prevention and health equity for all (11). In order to achieve these goals, the importance has been recognized of addressing the social determinants of health, defined as the societal conditions in which we grow, live, and work over the life-course shaped by political, social, and economic forces that affect human health (12, 13). With this definition in mind, I will now briefly discuss the potential public health strategies at various levels of the spectrum of prevention with related policies and clinical implications. While the implications of this dissertation are situated at the tertiary level, or intervention stage, all levels of prevention are interconnected and therefore need to be discussed.

Preventive interventions can be implemented at the primary, secondary, and tertiary level. Primary prevention interventions aim to improve the overall health of the population and they can focus on legislation and enforcement of anti-trafficking policies and anti-trafficking awareness campaigns of both commercial sex and labor trafficking. Policies and programs that support education and childhood protection; alleviation of poverty; fair labor practices and working conditions; labor migration policies to minimize trafficking; a minimum wage that

allows an adequate standard of living; and social protection systems all need to be part of a primary prevention strategy.

Prevention of human trafficking and its related consequences of violence and coercion with mental health also entails recognizing gender inequality and discrimination. To this end, challenging social attitudes and cultural norms that keep women and girls oppressed, and enforcing legislation that addresses discriminatory practices and violence for females could also contribute to preventing trafficking. Strengthening opportunities for women and girls through empowerment programs that emphasize sexual and reproductive rights and education for women and children is also imperative. All these approaches could be part of preventive primary anti-trafficking strategies and would enhance subsequent levels of prevention.

Secondary interventions that seek to reduce the impact of the burden of disease in trafficking survivors should address risk factors of forced labor. For instance, protection and enforcement of labor rights for workers in sectors that are known to be susceptible to exploitation (e.g., sex work, agriculture, domestic work, and fishing). In this sense, formal procedures by labor inspectors, law enforcement, and other governmental officials are crucial to guide the screening and detection of trafficked individuals in labor sectors and provide referral to appropriate services.

Special attention should be given to displaced people (e.g., refugees and asylum seekers) and migrants including unaccompanied and separated minors, as it is well documented that these populations are more vulnerable to being abused and trafficked (14-17). Thus, inclusive and less restrictive immigration policies that also support family reunification and access to the labor market may contribute to reducing exploitation among these populations.

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Corruption and poverty go hand-in-hand and are complex risk factors for human trafficking as they promote, among other things, non-regulated labor environments that are fertile grounds for labor exploitation and traffickers to operate with impunity (1, 18). Corruption has a corrosive effect on the access of the poor to public goods and increases social and economic inequalities (19). Tackling corruption is paramount and challenging, but strengthening institutions to be more accountable, and proactively investigating and prosecuting officials complicit in trafficking could be a start. It is also important to implement formal policies to ensure that trafficking survivors are not incarcerated, punished, or placed in detention centers awaiting deportation for acts committed as a result of being trafficked. Therefore, provision of legal services and alternatives to deportation to countries where they face retribution by traffickers and adversity is important. Likewise, extension of protection and legal services to relatives of survivors of trafficking is a crucial component to tackling trafficking and ensuring protection for survivors of trafficking as well.

Tertiary prevention aims to provide clinical treatment and recovery for trafficking survivors. The findings of the dissertation focus on this level of prevention; therefore, in the following paragraphs, I discuss specific recommendations suggested by my findings.

First, it is important to recognize that survivors of trafficking are diverse in terms of their sociodemographic background, their trafficking experiences, and their mental health. This complexity sums up to the challenges of addressing the physical and mental health needs of survivors. Future interventions need to be culturally sensitive and coordinated care across multiple sectors and service providers (e.g., mental and physical health, social services, safety, housing, legal counsel, economic aid, community and societal reintegration) needs to part of the recovery process of trafficking survivors. Given the diverse profiles of trafficking survivors, it is

important that service providers be well trained with strong multicultural competencies and knowledge of the various forms of exploitation. The efficacy of psychological treatments for survivors of human trafficking has not been investigated, although evidence-based treatments for people exposed to complex traumas (e.g., refugees, asylum seekers, and survivors of armed conflicts) may be tailored for trafficked individuals. Interventions need to be adapted according to the level of development of the individual and age.

My results showed that trafficking survivors were exposed to severe traumatic events and consequently they may need time to process their traumatic experience and require assistance with other immediate needs (e.g., safety, immigration, or legal services). A fundamental element of care for trafficked individuals should provide a safe and healing space that recognizes the importance of establishing a partnership with the survivor of trafficking, respects her or his perspective, and acknowledges human rights principles (e.g., the right to health and the right to be free from slavery) as the driving force for service provision. By the same token, assistance and protection of survivors of trafficking should be given regardless of their country of origin, legal status, and participation in the legal prosecution of traffickers.

Public health is a discipline that is science-based, prevention-focused, interdisciplinary, collaborative, social-ecologically-oriented (downstream and upstream determinants), with a focus on improving social justice and fundamental human rights. Public health can have an important contribution to promote and improve the well-being of people at risk of being trafficked, and trafficking survivors.

With this understanding of what constitutes public health, survivors of trafficking, researchers, advocates, and stakeholders can contribute in each of the three levels of prevention and end the pervasive violation of human rights inflicted by human trafficking. Finally, as

discussed above, a public health framework recognizes that human trafficking does not occur in a vacuum. Therefore, addressing the social determinants of health as major structural forces (e.g., gender, social and economic inequities, gender discrimination, poverty, violence, and corruption) that contribute to economic and social deprivation and keep individuals oppressed and without access to education, is fundamentally important to eradicate human trafficking.

Future Research Directions

As a relatively new field of study for researchers, there are many directions in which research on human trafficking can evolve. First, research in this field would benefit from a unified terminology. Embracing the term "modern slavery," as suggested by scholars, will provide a broader and more inclusive term that comprises different crimes, such as human trafficking, forced labor, slavery, child labor, bonded labor, and forced marriages with the common denominator of exploitation (14, 20). Lack of a common "language" on a crime with the global dimensions of trafficking has clear implications for anti-trafficking legislation and policies to protect and cover provisions for survivors of trafficking (14). For instance, in some countries forced labor is only criminalized as a result of trafficking while in other countries prosecution of forced labor can be done in the absence of trafficking (21). Provisions of services can also be constrained to specific legal definitions of what constitutes trafficking, as some organizations only provide services to females. In fact, men and boys are extremely underrepresented in policy-making and service allocation (7).

The lack of a more comprehensive and inclusive conceptualization of exploitation has also led to erroneous ideas that forced labor has to be "forced" to work (21). The reality is that many workers (e.g., documented and undocumented migrants) often consent to do the work and

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later discover that they are captive, exploited or were deceived about the conditions and nature of the work. Although international law establishes that in the event of fraud or deception, the initial consent of the person is irrelevant, this issue is not clear-cut and it is often ignored (21). In this sense, as discussed by scholars, exploitation should be considered as a continuum and not as a binary entity (6, 9, 20, 21). This understanding has two important implications.

First, the labor experiences of workers depend on a country's legal frameworks, crime, migration, and individual circumstances, among other things. Therefore, work experiences differ and cannot be defined as "forced or not forced labor." Second, this continuum approach acknowledges the changing dynamics of the workforce, captures various forms of exploitation, and gives understanding of work sectors where there is a spectrum of abuse and, therefore, slavery can occur. This is also relevant for other at-risk populations that may linger in the gray areas of the continuum of exploitation, for example smuggled migrants (persons who illegally cross a border to enter a country of which they are not nationals or residents by paying or providing other material benefit), refugees (persons who have been forced to leave their country due to threats or persecution and protection has been granted), asylum seekers (those who have applied for protection as a refugee and are awaiting the determination of their status), and internally displaced people (22). There is also overlap between these populations. Victims of trafficking may be migrants who have been smuggled and may also be refugees, but not all trafficked people are smuggled migrants or refugees (14). It is also documented that refugee camp conditions, where people are sometimes confined for an indefinite number of years, tend to be precarious, and people are deprived of basic needs (food, water, and proper shelter) which increases the possibilities for exploitation and violence (2). Like survivors of trafficking, these

populations are known to have higher prevalence of mental disorders, such as anxiety, depression, and PTSD (23-25).

The concept of a continuum of exploitation also moves us forward to develop interventions along this spectrum of circumstances (6, 21). Most importantly, the understanding of a continuum of exploitation could have implications for all workers in general by surpassing the narrow focus of criminal law enforcement (victim versus offender) and advocating to improve structural labor conditions such as reinforcing labor rights and protection for all workers, improving or conducting labor inspections, enforcing minimum wage legislation, social protection, and union freedom and collective bargaining, among others. In sum, legal prosecution is imperative but not sufficient and therefore has to go hand-in-hand with policies, interventions, and programs that seek to address the multiple factors that drive human trafficking.

Another important consideration is to expand our understanding of the diverse forms of exploitation beyond sex trafficking. People can also be trafficked many times or simultaneously in different sectors (mixed exploitation), and in various countries (14). This is an important consideration for researchers, providers, and policy-makers, as clearly it can have implications for the mental and physical health of trafficking survivors.

Further research will benefit from the documentation of the range of experiences before, during, and after trafficking as well as the diversity of individuals trafficked and sectors of exploitation. Today, much of our understanding of trafficking and its impact on mental health comes from studies of victims trafficked primarily for sexual exploitation. As I have shown in this dissertation, trafficking experiences differ according to sector of exploitation and sex.

Further research will need to assess the comorbidity of mental disorders among trafficking survivors. I found a triple comorbidity of anxiety, depression, and PTSD.

Comorbidity increases the chronicity of each disorder, slows recovery, and increases the likelihood of a recurrence once the patient has recovered (26-29), all of which could impact the psychosocial functioning and the well-being of trafficking survivors.

Moreover, future research is needed to conceptualize and analyze the effects of the cumulative impact of traumatic experiences on mental health throughout the life course. It is not uncommon for trafficking survivors to report sexual and physical abuse or other adversities (e.g., poverty or violence) in their lifetime before being trafficked (8). This research could potentially give us insight into the underlying biological, behavioral, and psychosocial processes that drive disease across the life of trafficking survivors. This is especially relevant for children and adolescents.

Research and interventions that can contribute to understanding and addressing the effects of the social determinants of health and human trafficking is warranted. For instance, social and policy analysis related to females' empowerment, perceived social position, economic participation in the workforce, access to education, poverty and violence, among other things, could be useful to assess the implementation and enforcement of such policies and their impact on the health of populations at risk and trafficking survivors. Likewise, implementation and systematic evaluation of interventions on the social determinants of health (e.g., social safety nets to alleviate poverty) in the trafficked population are important as they can have policy and health implications for people at risk and survivors of trafficking.

Currently, trafficking research has numerous methodological and ethical limitations. There are no studies on trafficking to date that are representative of all trafficking survivors within a region. The majority of the studies are based on samples from post-trafficking services (6). This limitation raises methodological challenges related to the generalizability and external

validity of the study. This is an important consideration, as inadequate methods might affect implementation of programs and policies.

Recently, researchers have been using social media platforms to recruit participants known to be hard to reach and hidden populations (e.g., substance abusers or men who have sex with men) (30, 31). The strength of internet-based surveys is that they can reach more potential respondents; enable inclusion of low-incidence or "hidden" population groups; enable rapid, convenient input by respondents; and reduce bias in response to sensitive, potentially stigmatizing topics (30, 32). Therefore, the use of social media in the study of human trafficking may need to be explored within its limitations of using social media and not fully being able to determine the representativeness of the sample. However, it is known that traffickers use social media platforms (e.g., Facebook or Google targeted advertisements, online escort advertisements, and websites such as Backpage.com and Craigslist) to recruit and exploit people, in many cases targeting children and adolescents (33-35). Researchers could also use these means to promote prevention and awareness of human trafficking and to understand how perpetrators operate on social media platforms.

Conclusion

This dissertation has examined sex-specific associations of the effects of violence and coercion on mental health symptoms (anxiety, depression, and PTSD). I assessed how contextual conditions of trafficking (living, working, and legal and economic insecurity) affect the mental health of trafficking survivors. I analyzed the patterns of violence and coercion and described the emergent classes to evaluate their impact on mental health symptoms in females and males. The results of this dissertation contribute to the existing but scarce knowledge on human trafficking and mental health and overcome previous research limitations by using a large health survey of

diverse trafficking survivors exploited in various labor sectors and countries. I have used

rigorous methods, appropriate for the study, but not previously used in human trafficking

research. The results can be used to inform providers, researchers, and policymakers to develop

appropriate evidence-based mental health interventions and services to address the needs of

trafficking survivors. This evidence can also be useful for legal procedures and prosecution of

traffickers.

Finally, it is my intention that this research should also help us to see that we need to

move beyond temporary or narrow solutions and recognize that addressing human trafficking

requires interdisciplinary approaches to attend to the health needs of survivors and confront the

root causes of modern slavery.

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Appendix

Table A-1 Three-class model of violence and abuse of formerly trafficked females (n = 569)

	Class I		Class II		Class III	
Latent class prevalence based on the estimated model	0.12		0.24		0.64	
	Item-response probability	se[a]	Item-response probability	se	Item-response probability	se
Violence and coercion indicators						
Slapped you or threw something at you that could hurt you	0.97	0.03	0.42	0.16	0.00	0.00
Pushed or shoved you	0.92	0.04	0.28	0.04	0.01	0.02
Hit you with a fist or with something else that could hurt you	0.92	0.05	0.13	0.04	0.00	0.00
Kicked, dragged, or beat you up	1.00	0.00	0.13	0.07	0.00	0.00
Tied or chained you	0.19	0.05	0.05	0.03	0.00	0.00
Choked you on purpose	0.27	0.05	0.09	0.03	0.00	0.00
Forced you to have sex	0.74	0.13	0.58	0.13	0.19	0.10
Threatened to use a gun, knife, or other weapon against you	0.42	0.07	0.14	0.04	0.01	0.00
Receiving threats during trafficking						
Personal threats	0.63	0.10	0.53	0.06	0.07	0.04
Both, personal and family threats	0.34	0.10	0.17	0.04	0.10	0.07

[a] Standard error.

Table A-2 Three-class model of violence and abuse of formerly trafficked males (n = 446)

	Class I		Class II		Class III	
Latent class prevalence based on the estimated model	0.50		0.28		0.22	
	Item-response probability	se[a]	Item-response probability	se	Item-response probability	se
Violence and abuse items						
Slapped you or threw something at you that could hurt you	0.00	0.00	0.90	0.02	0.50	0.07
Pushed or shoved you	0.03	0.02	0.85	0.03	0.46	0.04
Hit you with a fist or with something else that could hurt you	0.02	0.01	0.96	0.06	0.19	0.11
Kicked, dragged, or beat you up	0.00	0.00	0.78	0.04	0.13	0.04
Choked you on purpose	0.00	0.00	0.15	0.02	0.05	0.01
Threatened to use a gun, knife, or other weapon against you	0.00	0.00	0.52	0.06	0.38	0.03
Receiving threats during trafficking						
Personal threats	0.13	0.03	0.81	0.05	0.76	0.02
Both, personal and family threats	0.09	0.06	0.13	0.04	0.11	0.05

[a] Standard error.