

# Trauma Informed Care: Trafficking Out-Comes (TIC TOC Study)

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## Abstract

**Background:** Little is known about the impact of trauma-informed primary healthcare on recovery from human trafficking, or individual characteristics associated with successful participation in community services. **Objective:** To evaluate the efficacy of a trauma-informed family medicine clinic, the Medical Safe Haven (“MSH”), in facilitating success in a community-based anti-trafficking victim service program, Community Against Sexual Harm (“CASH”), and to identify participant characteristics associated with successful CASH completion. **Methods:** Retrospective analysis of data from 57 adult females participating in the CASH program, 37 of whom received care at MSH. We examined differences in descriptive statistics between those who completed the CASH program and those who did not; then conducted logistic and linear regressions testing the association between MSH care and CASH program outcomes. Survival analysis models examined the time to CASH program drop-out (program incompleteness). **Results:** Odds of successful CASH completion increased by a factor of 5.37 for MSH patients compared to other participants. This association strengthened with increases in the duration of MSH care and degree of patient engagement. The positive association of MSH care on program completion was mediated by the length of program participation. The extended length of participation among MSH patients was even stronger when those patients were in a stable and independent housing situation. The risk of program incompleteness was 68% lower for MSH patients compared to other participants. **Conclusions:** Adults who experience human trafficking and receive healthcare at MSH are significantly more likely to successfully complete the CASH program than those who do not receive healthcare or who use alternative health systems. Study findings argue for the importance of consistent, trauma-informed longitudinal healthcare for trafficked persons.

## Keywords

human trafficking, medical, education, trauma informed care, family medicine, PTSD, primary care, health outcomes

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## Introduction

Severe forms of human trafficking (HT) involve a variety of acts in which force, fraud or coercion are used to exploit persons in commercial sex and/or forced labor.<sup>1</sup> The true prevalence and demographics of HT are unknown in the United States, given limitations in identification, reporting, inconsistent definitions, and methodological challenges in researching a “hard to reach” population.<sup>2–4</sup> The National Human Trafficking Hotline received 11 500 cases of HT in 2019, of which 8753 involved sex trafficking and 6684 involved adults.<sup>5</sup>

The health consequences of HT are numerous and varied, ranging from sexually transmitted infections (STI); Human immunodeficiency virus (HIV) infection; acute and

chronic trauma related to violence, accidents, and overuse injuries; unwanted pregnancy and associated complications, substance abuse disorders, fatigue, and chronic pain, to post-traumatic stress disorder (PTSD), complex PTSD, major depression, suicidality, and anxiety disorders.<sup>6–9</sup> One or more of these conditions may lead a person experiencing

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HT to seek medical or mental health care. Studies demonstrate frequent use of healthcare services by trafficked persons in the US, especially those who are commercially exploited for sex. In 1 study of adolescents experiencing sex trafficking, nearly 43% had seen a healthcare provider within the 2 months prior to identification.<sup>10</sup> Another study of commercially sexually exploited adolescents found that 82.5% had visited the pediatric healthcare system within the prior year.<sup>7</sup> Among women and adolescent females seeking post-trafficking care, Lederer and Wetzel<sup>11</sup> found that nearly 88% had sought health or mental healthcare during their period of exploitation.

There is general consensus that a trauma-informed, culturally sensitive and person-centered approach to patient care is the preferred way to serve those who have experienced HT or who are at risk for exploitation.<sup>12,13</sup> The “trauma-informed approach” emphasizes provider knowledge of, and accommodation for the impact of prior trauma on a patient’s thoughts, feelings, attitudes, beliefs, and behaviors.<sup>14</sup> It stresses the need for empathy, transparency, respect, consent, and patient empowerment, with a strength-based approach to patient care, and a focus on the best interests of the individual (person-centered).<sup>15,16</sup> Such practices are strongly recommended by those who have sought healthcare during or after periods of trafficking yet evidence from these survivor studies demonstrate that a lack of trauma-informed care is relatively common among health professionals.<sup>17-22</sup> In fact, several studies of healthcare professionals’ knowledge of HT and associated care for affected patients demonstrate relatively low rates of prior training.<sup>23-29</sup> In a study of emergency department staff, Donahue et al<sup>26</sup> found that 89% of participating nurses, physicians, advanced practitioners, registration, and ED technicians had not received prior training on HT. Nordstrom studied multidisciplinary healthcare professionals from outpatient and inpatient settings and found that only 24.1% of participants had received prior training on HT and the trauma-informed approach was the least common topic covered. Notably, in family medicine residency training, a mere 6% of programs indicated advanced competency in regards to their resident physician’s proficiency with human trafficking.<sup>28</sup>

There is clearly a need for education of healthcare providers on a trauma-informed approach and on the dynamics and health impact of HT. Unfortunately, to date, there is little objective data quantifying patient centered outcomes with the application of human trafficking education or trauma informed care training. Regardless, it makes intuitive sense that clinicians need to be aware of, and responsive to the myriad acute and chronic health and mental health needs of those who have experienced HT and those at risk. There is also a need for outpatient health and mental health services that recognize and accommodate the unique and often extensive needs of persons who have experienced

HT. Over the past several years, a few healthcare organizations have developed outpatient primary care clinics specifically designed to provide longitudinal care to this population.<sup>30-32</sup> There is an emphasis on providing holistic, trauma-informed, culturally sensitive, and person-centered care, as well as adapting clinic practices to better meet the needs of patients who have experienced trafficking.<sup>30-33</sup> Often this entails integration of multiple services delivered in the primary care medical setting, such as reproductive and sexual health, mental health, obstetrics/gynecology, dental, and social work services.<sup>32,34,35</sup> The HT medical home establishes ties with specialty healthcare providers to minimize barriers to additional services.<sup>29,31</sup> Typically, these longitudinal care clinics work closely with community agencies and organizations that fulfill other critical needs such as housing, food, job training, immigration assistance, and substance abuse treatment. Specialized human trafficking clinics also adjust policies and practices to accommodate those patients who have unstable housing, no insurance, those who encounter safety issues, or transportation difficulties, who have minimal access to healthcare during normal business hours and who may be experiencing ongoing exploitation.<sup>32</sup> Efforts to accommodate the life situation of patients may include walk-in and direct phone lines and text messaging for immediate services, 24/7 healthcare provider assistance, safe and secure clinic spaces, and no or low cost services. Adequate time for appointments is built into the practice, and providers focus on trust-building, patient empowerment, and shared decision-making.<sup>30-33</sup> Of particular importance to this specialty clinic model is the active input in planning and implementation by persons who have lived experience in HT, themselves, which helps to prioritize patient voice and perspective.<sup>29,30,32,34</sup>

The Medical Safe Haven (MSH) at Methodist Hospital of Sacramento is a continuity clinic staffed by family practice residents who have been highly trained in victim-centered, trauma-informed patient care, and human trafficking by attending physicians in family medicine and psychiatry. Resident physicians additionally have experiential learning with patient encounters initially proctored to ensure standardization and level of expertise.<sup>31</sup> The MSH provides full scope family medicine primary care and reproductive health services for individuals who have experienced HT, predominantly females reporting sex trafficking. Services include newborn, pediatric and adolescent care, women’s health, primary psychological care, LGBT+ affirming care, annual physical examinations, vaccinations, sexually transmitted infection (STI) testing and treatment, prenatal, intrapartum and postpartum care, chronic medical disease management, acute/urgent care, and referrals to community resources. The clinic was developed in 2015 within a family medicine residency clinic ([www.dignityhealth.org/mshclinic](http://www.dignityhealth.org/mshclinic)). The first patient who had experienced trafficking was seen in June 2016, and by December 2021, MSH provided over

3300 patient visits for patients who have experienced human trafficking. The goal of the MSH program is to improve the health outcomes and socioeconomic situation of those who experience trafficking by mitigating barriers to care and increase equitable access.<sup>30,32</sup> Additionally, this clinic works to replicate this model within other primary care residency clinics.<sup>36,37</sup> Such barriers may include exposure to situations that trigger anxiety and painful associations within an individual, such as bias and insensitivity at the hands of others, uncertainty and lack of control, restricted choice, and limitations in accessibility of assistance for a continuity of care.

Community Against Sexual Harm (CASH) is a community-based organization that serves women who have experienced commercial sexual exploitation through survivor-led peer support and harm reduction services. Case workers have lived experiences of exploitation as well lending to their expertise. CASH was created in 2008 in Sacramento, California. It provides a “safe and non-judgmental” space where female sex workers are able to receive support, referrals, food, and basic health care assistance. At time of any of CASH enrollment many participants have experienced exploitation via human trafficking. CASH receives participants from street outreach efforts, child protective services referrals, self-referrals, law enforcement, and other community agencies. Additionally, central to the CASH program is the RESET (Reducing Sexual Exploitation and Trafficking) sex work diversion program, developed in collaboration with the District Attorney’s Office and the Office of the Public Defender. In 2016, there were 59 RESET program graduates whom had experienced trafficking. Although a minority of participants complete the CASH program those that do have significantly lower indicators of recidivism back to trafficking situations. Less than 3% of CASH graduates re-offended. To help improve participants meeting these success indicators, factors that influence CASH program completion need to be identified.

The purpose of the current study is to evaluate the efficacy of the MSH in facilitating success in the Community Against Sexual Harm’s anti-trafficking program (CASH), and to identify participant characteristics at the time of CASH enrollment that may be associated with successful program completion as measured in a checklist of participant goals.

## Methods

### Study Sample

This retrospective analysis was based on data collected from 66 individuals enrolled into the Community Against Sexual Harm’s Anti-Trafficking Program (CASH program) between May 1, 2016 through June 30, 2018. Data was collected through September 1, 2019 from all available CASH

participant records, which included primarily self-reported demographic, psychosocial, health, and behavioral information. Nine individuals included in the original sample were missing information on 75% or more of the measures and were excluded from the analysis, resulting in a final sample of 57 individuals. Of the final sample, 37 individuals (65%) received care at MSH, and additional data for this subgroup’s level of engagement with MSH (eg, number of appointments, referrals) was provided by Dignity Health. The study received approval from the Dignity Health Institutional Review Board.

Individuals are referred to the CASH program by child protective services through Dept 90 CSEC youth (CASH reaches out when client reaches age 18), law enforcement, street outreach recruitment efforts, community agency referral, self or family referral, and the District Attorney victims advocate. Inclusion criteria include meeting the Trafficking Victims Protection Act (TVPA) definition for persons exploited via human trafficking; exclusion criteria include minors under the age of 18 and individuals with the gender identity of male. At the time of enrollment, participants are asked to provide extensive information on demographics, trauma history, experiences of exploitation/trafficking, mental and physical health symptoms and signs, basic needs, and healthcare needs. Each client is provided information that part of recovery and resilience involves seeking health care and they are given options to federally qualified health centers (FQHC) and other clinics in the community. The MSH is one of the options and clients are informed that this clinic uses trauma-informed physicians and clinic staff. Individuals also complete a checklist of program goals, including options for a secure permanent source of income; secure permanent housing; educational opportunities; a list of life skill goals (eg, attend at least 2 life skills classes provided by CASH); and physical and mental health maintenance goals (eg, establish health care with a doctor and attend appointments; address mental health concerns and meet with a therapist if recommended; participate in substance abuse treatment if applicable). A successful completion of the CASH program entails meeting at least 1 option in each category of the checklist. The case manager and client determine whether or not a specific goal has been “met.” There is no specific time period within which goals must be accomplished, but program incompleteness is defined as a return to a trafficking situation or absence of any program involvement for more than 6 weeks. Clients are able to return to the CASH program in the future, if they do not complete the initial attempt.

Demographic information about the CASH program participants in this sample and differences between those receiving and not receiving MSH care are outlined in Table 1. Fisher’s exact test was used to test the statistical differences in categorical measures between groups, while the Wilcoxon rank-sum test was used for numerical measures. The

**Table 1.** Sample Demographics.

Demographic measures	Overall		MSH treatment		Sig diff*
	Range	Mean (SD)/ Proportion (n/N)	Median (Mean)/ Proportion (n/N)	Median (Mean)/ Proportion (n/N)	P-value
Sample size	n = 57	n = 57	n = 37 (yes)	n = 20 (no)	
Age at CASH enrollment	18.0, 37.0	23.68 (5.30)	22 (23.14)	24 (24.70)	
Gender (female)	0, 1	98% (56/57)	97% (36/37)	100% (20/20)	
Sexual orientation (LGBT)	0, 1	25% (14/57)	24% (9/37)	25% (5/20)	
Race/ethnicity					.012
Black/African American	0, 1	33% (19/57)	22% (8/37)	55% (11/20)	
Multiracial	0, 1	40% (23/57)	54% (20/37)	15% (3/20)	
Other	0, 1	16% (9/57)	16% (6/37)	15% (3/20)	
White	0, 1	11% (6/57)	8.1% (3/37)	15% (3/20)	
Marital status					
Divorced/Separated	0, 1	7.0% (4/57)	8.1% (3/37)	5.0% (1/20)	
Married	0, 1	7.0% (4/57)	5.4% (2/37)	10% (2/20)	
Single	0, 1	86% (49/57)	86% (32/37)	85% (17/20)	
Highest level of education					
Less than HS educ	0, 1	54% (29/54)	60% (21/35)	42% (8/19)	
High school/GED	0, 1	22% (12/54)	14% (5/35)	37% (7/19)	
Some college or more	0, 1	24% (13/54)	26% (9/35)	21% (4/19)	
Has basic literacy	0, 1	86% (49/57)	89% (33/37)	80% (16/20)	
Primary language					
English	0, 1	96% (55/57)	95% (35/37)	100% (20/20)	
English/Spanish	0, 1	3.5% (2/57)	5.4% (2/37)	0% (0/20)	
Needs basic English educ	0, 1	36% (17/47)	42% (14/33)	21% (3/14)	
Wants Vocational educ	0, 1	76% (41/54)	71% (25/35)	84% (16/19)	

\*Fisher's test was used for dichotomous and other categorical variables; Wilcoxon rank-sum test was used for ordinal and continuous variables. P-value only shown if difference was statistically significant.

average age of participants in the sample was 24 years, and all participants were between 18 and 37 years old. All but 1 individual identified as female, and 86% identified as heterosexual. The majority of program participants identified English as their primary language, although slightly over a third noted a need for basic English education. In terms of other education, 54% said they had less than a high school degree, and 14% said they lacked a basic level of literacy. Nevertheless, 22% had a high school degree or GED, and another 24% said they had completed at least some college. The most notable demographic difference between MSH patients and other program participants was in terms of racial composition, with a greater proportion of MSH patients (54%) classifying themselves as multiracial and a greater proportion of other participants (55%) classifying themselves as Black or African American (P-value < .05).

Participants in the sample represented a particularly vulnerable group (see Table 2). All had histories of exploitation via human trafficking, with 1 reporting labor trafficking, and the rest reporting sex trafficking. At intake, participants were asked if they had experienced any of the following traumatic events in their lifetime: physical abuse, sexual assault,

sexual harassment, sexual abuse/rape, sexual exploitation, neglect, verbal/emotional abuse, stalking, or intimidation/control. Approximately 89% of participants said they had experienced at least one of these events, and most had experienced more than one. Participants were also asked if they were in need of basic essentials, such as access to food, clothing, and hygiene supplies. Almost all (96%) reported needing at least one of these essentials, and 42% reported being in need of all three. In addition, 10% of the sample was homeless at the time of program enrollment, and another 64% were in transitional or emergency housing. A majority (69%) reported government assistance programs as their primary source of income.

Participants had varied relationships with their trafficker(s) at the time of program enrollment. About a third of participants had been in contact with their trafficker, while 14% said they had contacts in common with them. A majority (65%) lived in the same city as their trafficker, although this situation was less likely among MSH patients. Alarming, about two-thirds (65%) said they or their family had been threatened by their trafficker, and 42% said their trafficker had searched for them (even more likely

**Table 2.** Vulnerability and Risk Measures.

Vulnerability and risk measures	Overall		MSH treatment		Sig diff*
	Range	Mean (SD)/ Proportion (n/N)	Median (Mean)/ Proportion (n/N)	Median (Mean)/ Proportion (n/N)	P-value
Sample size	n = 57	n = 57	n = 37 (yes)	n = 20 (no)	
History					
Age exploitation began	11.0, 30.0	17.62 (4.47)	17 (16.95)	16 (19.11)	
Victim type (sex = 1, labor = 0)	0, 1	98% (50/51)	97% (32/33)	100% (18/18)	
Experienced any trauma (of 9 total)	0, 1	89% (50/56)	92% (33/36)	85% (17/20)	
Trauma scale (sum of traumatic events)	0.00, 9.00	7.14 (2.89)	8 (7.42)	8 (6.65)	
Trafficker relationship					
Client knows trafficker's location	0, 1	48% (27/56)	47% (17/36)	50% (10/20)	
Potential to Encounter those feared	0, 1	43% (24/56)	36% (13/36)	55% (11/20)	
Trafficker in same city	0, 1	62% (35/56)	47% (17/36)	90% (18/20)	.002
Client associated with Shared Contacts	0, 1	14% (8/56)	11% (4/36)	20% (4/20)	
Trafficker searched	0, 1	42% (22/53)	53% (18/34)	21% (4/19)	.041
Trafficker knows location/family location	0, 1	46% (26/56)	44% (16/36)	50% (10/20)	
Trafficker has phone number	0, 1	31% (17/55)	37% (13/35)	20% (4/20)	
Trafficker/client have contact	0, 1	33% (18/54)	37% (13/35)	26% (5/19)	
Trafficker threatened	0, 1	65% (36/55)	71% (25/35)	55% (11/20)	
Threat scale (sum of above)	0.00, 7.00	3.24 (1.86)	3(3.24)	3 (3.22)	
Trafficker convicted or sentenced	0, 1	21% (10/47)	20% (6/30)	24% (4/17)	
Basic needs					
Needs food access	0, 1	68% (39/57)	73% (27/37)	60% (12/20)	
Needs clothing	0, 1	77% (44/57)	70% (26/37)	90% (18/20)	
Needs access to basic hygiene	0, 1	72% (41/57)	70% (26/37)	75% (15/20)	
Need at least 1 of the above	0, 1	96% (55/57)	97% (36/37)	95% (19/20)	
Need all 3 of the above	0, 1	42% (24/57)	41% (15/37)	45% (9/30)	
Housing status					
Homeless	0, 1	10% (5/50)	8.8% (3/34)	12% (2/16)	
Independent	0, 1	16% (8/50)	8.8% (3/34)	31% (5/16)	
Rehab/Other	0, 1	10% (5/50)	12% (4/34)	6.2% (1/16)	
Transitional/Emergency	0, 1	64% (32/50)	71% (24/34)	50% (8/16)	
Income source					
Employment	0, 1	7.4% (4/54)	5.6% (2/36)	11% (2/18)	
SSI/Government Assistance	0, 1	69% (37/54)	72% (26/36)	61% (11/18)	
Other	0, 1	7.4% (4/54)	8.3% (3/36)	5.6% (1/18)	
None	0, 1	17% (9/54)	14% (5/36)	22% (4/18)	

\*Fisher's test was used for dichotomous and other categorical variables; Wilcoxon rank-sum test was used for ordinal and continuous variables. P-value only shown if difference was statistically significant.

among MSH patients). Only about a fifth of the participants said that their trafficker had been convicted or sentenced.

In terms of their health (see Table 3), 89% of participants reported mental health concerns, with most reporting more than 1 concern (eg, depression, post-traumatic stress disorder, suicidal ideation/suicide attempt). In addition, 86% reported a history of substance abuse, and 53% reported an ongoing alcohol or drug addiction at the time of program enrollment. A majority of participants reported a need for physical healthcare (61%), reproductive healthcare (54%), and prescription medicine (61%). However, only 53% reported having a primary care physician, and only 40%

said they had a gynecologist. Among those that were not treated at MSH, the most common alternative healthcare providers were Kaiser and Medi-Cal aligned clinics.

### Analytic Strategy

Data analysis was conducted in 3 stages, using the statistical software program, R.<sup>38</sup> First, we examined differences in descriptive statistics (eg, means, proportions) between those who completed the CASH program checklist and those who did not, and we tested the statistical significance of differences observed. Fisher's exact test was used for

**Table 3.** Health Status and Healthcare Needs Measures.

Health status and healthcare needs measures at time of intake to CASH	Overall		MSH treatment		Sig diff*
	Range	Mean (SD)/ Proportion (n/N)	Median (Mean)/ Proportion (n/N)	Median (Mean)/ Proportion (n/N)	P-value
	Sample size	n = 57	n = 57	n = 37 (yes)	n = 20 (no)
Received health screening	0, 1	74% (42/57)	76% (28/37)	70% (14/20)	
History of substance abuse	0, 1	88% (50/57)	89% (33/37)	85% (17/20)	
AOD addiction	0, 1	53% (30/57)	49% (18/37)	60% (12/20)	
Has chronic illness	0, 1	12% (7/56)	11% (4/36)	15% (3/20)	
Self-reported MH concerns	0, 1	89% (50/56)	89% (33/37)	89% (17/19)	
Total reported MH concerns	0.00, 5.00	1.95 (1.18)	2 (1.89)	2 (2.05)	
Needs physical healthcare	0, 1	61%	67% (24/36)	50% (10/20)	
Needs reproductive healthcare	0, 1	54% (29/54)	51% (18/35)	58% (11/19)	
Needs Rx	0, 1	61% (34/56)	64% (23/36)	55% (11/20)	
Has PCP	0, 1	53% (29/55)	47% (17/36)	63% (12/19)	
No PCP + Need for Physical Healthcare	0, 1	40% (22/55)	44% (16/36)	32% (6/19)	
Has gynecologist	0, 1	40% (23/57)	41% (15/37)	40% (8/20)	
Has psychiatrist	0, 1	22% (11/51)	16% (5/32)	32% (6/19)	
Health provider					<.001**
MSH	0, 1	65% (37/57)	100% (37/37)	0% (0/20)	
Kaiser	0, 1	5.3% (3/57)	0% (0/37)	15% (3/20)	
Medi-Cal	0, 1	11% (6/57)	0% (0/37)	30% (6/20)	
Other	0, 1	12% (7/57)	0% (0/37)	35% (7/20)	
Unknown/none	0, 1	7.0% (4/57)	0% (0/37)	20% (4/20)	

\*Fisher's test was used for dichotomous and other categorical variables; Wilcoxon rank-sum test was used for ordinal and continuous variables. P-value only shown if difference was statistically significant.

\*\*Significant differences driven by MSH category versus others as opposed to differences among non-MSH providers.

testing differences in proportions because the Pearson Chi-square test of independence has been shown to be less accurate in small samples, such as this, where the expected number of cases in a given cell may be less than 5.<sup>39</sup> For numerical variables, the Shapiro-Wilk test was used to test the normal distribution assumption, and the results suggested that the assumption was violated for most measures. Therefore, the Wilcoxon rank-sum test was used in place of the standard 2-sample *t*-test because it does not rely on the normality assumption.<sup>40</sup> While the Wilcoxon test measures differences in medians as opposed to means, supplemental *t*-tests on the mean were also conducted, and the results were consistent (analysis not shown).

Second, we ran a series of logistic and linear regressions to test the association between MSH care and CASH program outcomes. Specifically, we used logistic regression to examine the relationship between being an MSH patient and completing the program checklist (coded "1" if the checklist was completed and "0" if the participant stopped participating for 6 weeks or more and/or returned to a trafficking situation). The initial, or base, model included only MSH status, and then additional models with select control variables were constructed to address potential concerns

regarding omitted variable bias. Given the relatively small sample size and associated issues of limited statistical power, all potentially confounding variables were not included in the same model. Instead, they were categorized into 3 thematic groups, with each group included in separate models. The 3 thematic groups were based on (1) healthcare status and needs, (2) measures of vulnerability and risk, and (3) demographic characteristics. Table 4 outlines the variables included in each. To further test the association between MSH care and program outcomes, we then examined how the *duration* and *degree* of MSH care was related to the completion of the checklist. As with the baseline analysis, we explored whether these associations held while controlling for key healthcare, vulnerability/risk, and demographic factors.

As MSH patients participated in the CASH program longer, on average, than other participants (MSH  $\approx$  9 months, non-MSH  $\approx$  4 months; *P*-value <.001), we examined whether program length was a mediating factor in the relationship between MSH care and checklist completion. We then ran a series of linear regression models to further investigate the relationship between MSH care and the length of program participation. These models included the

**Table 4.** Control Variables.

Variable name	Description
<b>Healthcare measures</b>	
Healthcare status scale	Coded 0-5, depending on how many of the following health providers the participant reported they had at the time of enrollment: primary care physician, gynecologist, psychologist, dentist, optometrist
Healthcare needs scale	Coded 0-5, depending on how many of the following the participant reported that they needed at the time of enrollment: physical healthcare, reproductive healthcare, dental care, optometry care, medical prescription
<b>Vulnerability and risk measures</b>	
AOD addiction	Coded 1 if the participant reported an alcohol or drug addiction at the time of enrollment, coded 0 otherwise
Self-reported mental health concerns	Coded 1 if the participant reported any mental health concerns at the time of enrollment, coded 0 otherwise
High need	Coded 1 if the participant reported being in need of access to food, clothes, and hygiene essentials, coded 0 otherwise
Trauma	Coded 1 if the participant reported experiencing at least one of nine traumatic events, coded 0 otherwise
Trafficker risk	Coded 1 if the participant reported at least one of nine trafficker risk indicators, coded 0 otherwise
Income source	Coded 1 if the participant's primary source of income was through their own employment; coded 0 if they did not have a source of income, if their primary source of income was from government assistance, or if they indicated an "other" source of income
Housing situation	Coded 1 if the participant was living in an independent housing situation; coded 0 if they were in transitional/emergency housing, in rehabilitation housing, or were experiencing homelessness
<b>Demographic measures</b>	
Age at program enrollment	Measured in years
Race	Coded 1 if they indicated that they were multiracial, coded 0 otherwise
LGBT	Coded 1 if they identified as LGBT, coded 0 otherwise
Married	Coded 1 if they were married, coded 0 otherwise
High school education	Coded 1 if they had at least a HS degree or GED, coded 0 otherwise

3 thematically based control models, as well as an interaction model examining whether the association varied based on a participant's housing situation.

Third, and finally, survival analysis models were used to examine the time to program drop-out (program incompleteness), indicated by a participants' lack of interaction with the program for a period of at least 6 weeks and/or their known return to trafficking. Using Kaplan-Meier plots, we analyzed the probability of survival (the probability of not dropping out or, in other words, persisting in the program) for each participant, and we compared the Kaplan-Meier curves for MSH patients and other program participants. Log-rank tests were used to test the statistical significance of differences between MSH patients and other program participants. We also ran Cox Proportional-Hazards models to investigate whether the observed patterns remained when control variables were included and to determine the Hazard Ratio, or the relative risk of incompleteness, between MSH patients and other program participants. Hazard Ratios are commonly interpreted as relative risk, but it is important to note that relative risk focuses simply on whether or not the

event occurred by the end of the study. The Hazard Ratio takes into account the timing of each event into its calculation. Thus, the 2 are not entirely interchangeable.

## Results

*Differences across program completion status.* Of the 57 CASH program participants in the sample, 21 (37%) completed the goals delineated in their program checklist. Statistically significant differences between participants that completed the checklist and those that did not are shown in Table 5. Most notably, 86% of those who completed the checklist were MSH patients. Additionally, those completing the checklist participated in the program longer, on average, than those who did not complete the checklist, with average program length being approximately 13 and 4 months, respectively. Finally, all participants who reported an alcohol or drug addiction *and* completed the addiction treatment program also completed their remaining goals on the checklist. No other statistically significant differences were observed across program completion status.

**Table 5.** Differences Across Program Completion Status.

Measure	CASH completion		Sig diff*
	n = 21 (yes)	n = 36 (no)	
	Median (Mean)/Proportion (n/N)	Median (Mean)/Proportion (n/N)	P-value
MSH treatment	86% (18/21)	53% (19/36)	.02
Health provider**			.037
MSH	86% (18/21)	53% (19/36)	
Kaiser	0% (0/21)	8.3% (3/36)	
Medi-Cal/FQHC	4.8% (1/21)	14% (5/36)	
Other	0% (0/21)	19% (7/36)	
Unknown/none	9.5% (2/21)	5.6% (2/36)	
Months participated in CASH program	13.27 (12.96)	3.38 (4.05)	<.001
Completed AOD treatment	100% (8/8)	0% (0/14)	<.001
(Missing cases)	13	22	

\*Fisher's test was used for dichotomous and other categorical variables; Wilcoxon rank-sum test was used for ordinal and continuous variables. P-value only shown if difference was statistically significant.

\*\*Differences driven by MSH (when MSH excluded, differences in CASH completion across different providers are not significant).

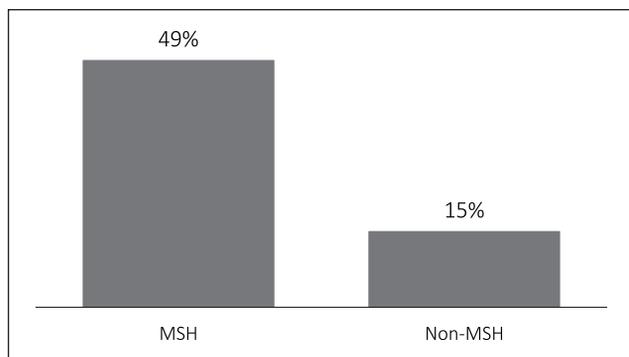
**Table 6.** MSH on Checklist Completion.

Predictors	Base model (MSH only)		Healthcare model		Vulnerability/risk model		Demographic model	
	Odds ratios	Std. Error	Odds ratios	Std. Error	Odds ratios	Std. Error	Odds ratios	Std. Error
(Intercept)	0.18**	0.11	0.03*	0.05	0.03	0.06	0.15	0.24
MSH treatment	5.37*	3.8	6.58*	5.81	7.22*	6.78	6.65*	5.69
Healthcare status scale			1.12	0.3				
Healthcare needs scale			1.59	0.51				
AOD addiction					0.6	0.49		
Self-reported mental health concerns					6.79	8.51		
High need					0.75	0.67		
Trauma					2.42	3.38		
Trafficker risk					0.85	1.38		
Income source					0.89	1.55		
Housing situation					1.22	1.58		
Age (at CASH enrollment)							0.98	0.06
Race							0.68	0.48
LGBT							1.35	0.98
Married							2.29	2.78
High school education							2.11	1.5
Observations	57		41		40		54	
R <sup>2</sup> (McFadden's)	.09		.15		.18		.10	
AIC	72.17		55.47		63.33		76.77	

\* $P < .05$ . \*\* $P < .01$ .

**Regression models.** Table 6 presents relationships between MSH care and completion of the CASH program checklist. The findings demonstrate that MSH patients were more likely than other program participants to complete the checklist of goals. Specifically, the odds of completing the program checklist increased by a factor of 5.37 for MSH

patients compared to other participants. For ease of interpretation, we also calculated the predicted probabilities for each group. MSH patients were predicted to have a 49% probability of completing the checklist, compared to only 15% for other program participants (see Figure 1). This finding was robust to the inclusion of control variables.



**Figure 1.** Predicted probability of completing the CASH program checklist by MSH status.

Indeed, significance of the MSH treatment coefficient remained steady across the 3 control models, and the odds ratio actually increased. However, none of the control variables were statistically significant. As the regression analysis employed listwise deletion, missing values on some of the control variables led to differences in samples sizes across the models. To conduct the likelihood ratio tests, mean imputation was used to address the issue of missing values and to enable standardized sample sizes across models. Likelihood ratio tests were then completed between the control models and a null (intercept only) model and this revealed that only the healthcare model was statistically significant ( $P < .05$ ), while none of the control models demonstrated a better fit to the data than the original MSH only (base) model. In supplemental analyses not shown, we also ran the models with more detailed provider information (MSH, Kaiser, Medi-Cal, Other, None), but the results were not significant, likely due to the small sample size of those using other providers (each of the 4 non-MSH providers had a sample size less than 10). In additional supplementary analysis (not shown), we modified the healthcare model to include only information about whether a participant reported the following: having a primary care physician, having a gynecologist, needing physical healthcare, and needing reproductive care. The results from the modified healthcare model were consistent with those from the healthcare model shown here.

We also tested the relationship between MSH treatment duration and program checklist completion, and the results are shown in Table 7. In the base model, we found that the odds of completing the checklist increased by a factor of 1.1, or 10%, for each additional month of MSH treatment. The predicted probability of completion across key time points in the program was charted and is shown in Figure 2. The positive association between MSH treatment duration and program checklist completion was robust across the 3 control models. Similar to the first set of models, however, likelihood ratio test results suggested that none of the control models fit the data better than the base model.

To test how the *degree* of engagement with MSH was associated with program checklist completion, we ran an additional set of models on a subsample including only MSH patients to determine how the number of appointments they made related to checklist completion (findings shown in Table 8). Findings revealed that the number of appointments made was associated with incremental increases in the likelihood of completing the checklist. Indeed, for each additional appointment made, the odds of completing the checklist went up by about 6%, and the predicted probabilities calculated at the minimum, mean and maximum appointments made are shown in Figure 3. Notably, similar findings were observed when we substituted either appointments kept (arrivals) or those formally canceled (cancellations) for total appointments but did not hold when we looked at appointments made but neither kept nor canceled (no shows). Together, these findings suggest that increased engagement with MSH was beneficial for program outcomes. We also ran associated control models, but with the exception of the demographics model, the findings did not hold (analysis not shown). This may have been a function of limited statistical power due to small sample size, as the final sample for the healthcare and vulnerability/risk models included only 28 individuals due to the use of listwise deletion in the regression analysis.

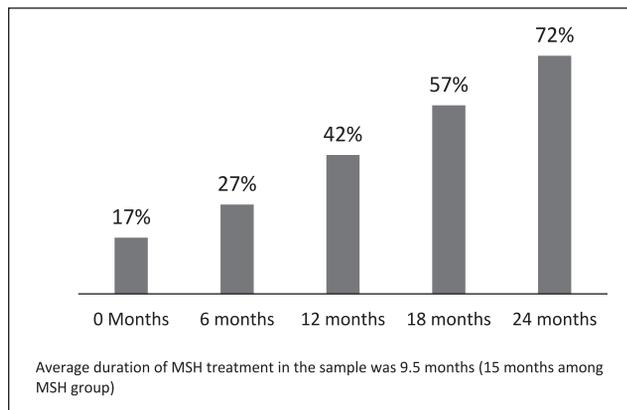
Finally, we were interested in understanding the mechanisms through which the relationship between MSH care and checklist completion operated. To that end, we ran a stepwise regression on checklist completion, with the base model including only MSH care and a second model including MSH care as well as a measure for participants' length of engagement in the CASH program (in months). The findings from the stepwise regression (see Table 9) reveal that the effect size for MSH decreased and lost significance when length of CASH program participation was included in the model, suggesting that participation duration mediated the relationship. In other words, MSH care was associated with increased participation length, which in turn, was associated with a greater likelihood of completing the checklist.

To further investigate the mediating role of program participation length, we ran a series of linear (OLS) models to examine how MSH care was associated with length of participation (Table 10). We found that MSH patients participated in the program, on average, approximately 5 months longer than other participants, and this positive association remained even when healthcare, vulnerability/risk, and demographic variables were held constant. In fact, when comparing the standardized coefficients (std Beta) across models, the effect size of MSH care on program participation length was greater in the healthcare and vulnerability/risk models. However, findings from partial  $F$ -tests (analysis not shown) demonstrated, once again, that the control models, as a whole, did not explain variations in program completion better than the MSH-only (base) model.

**Table 7.** Months of MSH Treatment on Checklist Completion.

Predictors	Base model		Healthcare model		Vulnerability/risk model		Demographic model	
	Odds ratios	Std. Error	Odds ratios	Std. Error	Odds ratios	Std. Error	Odds ratios	Std. Error
(Intercept)	0.20***	0.09	0.07	0.1	0.03	0.08	0.17	0.27
MSH treatment	1.11***	0.03	1.12**	0.04	1.09**	0.04	1.12**	0.04
Healthcare status scale			1.14	0.33				
Healthcare needs scale			1.34	0.46				
AOD addiction					0.75	0.63		
Self-reported mental health concerns					2.48	3.17		
High need					0.8	0.75		
Trauma					4.98	7.32		
Trafficker risk					1.52	2.86		
Income source					0.64	1.29		
Housing situation					0.39	0.55		
Age (at CASH enrollment)							0.98	0.07
Race							0.82	0.61
LGBT							1.53	1.24
Married							1.13	1.44
High school education							2.95	2.38
Observations	57		41		40		54	
R <sup>2</sup> (McFadden's)	.24		.29		.24		.24	
AIC	60.93		47.75		59.70		67.39	

\*\* $P < .01$ . \*\*\* $P < .001$ .

**Figure 2.** Predicted probability of completing the CASH program checklist by months of MSH treatment.

Among those with reported alcohol or other substance use disorders the odds of CASH completion increased by 25% for each additional month of MSH participation ( $P$ -value  $< .005$ ). In fact the predicted probability of CASH completion increased exponentially with duration of MSH participation (Figure 4).

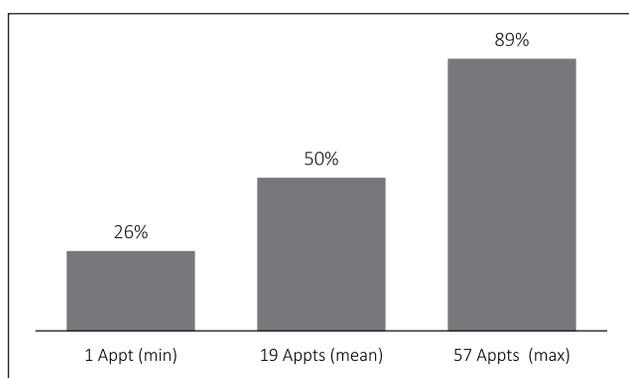
Lastly, given that securing a stable and independent housing situation is a critical achievement for those leaving trafficking, we examined whether the relationship between

MSH care and length of CASH program participation differed based on one's housing status. Initially, we ran the interaction model with a housing status variable that separated out each of the 4 different housing situations (independently housed, transitional/emergency housing, rehab/other housing, experiencing homelessness). As independently housed was the only significant category in that initial model, we collapsed the other 3 housing situations into an overarching group in order to present the significant results more clearly. Table 11 presents the results from an interaction model, examining the combined effect of MSH care and secure, independent housing on program participation length, as well as supplementary regression models looking at the relationship between MSH care and program participation length across subsamples defined by housing status. We found that those receiving MSH care and who had also secured independent housing participated in the CASH program, on average, approximately 9.5 months longer than those not receiving MSH care and not independently housed. In Figure 4, we show the differences in predicted program length between MSH patients and other participants by housing status. For those independently housed, predicted participation time was approximately 14 months greater for MSH patients than for other participants (a 329% difference), while for those not independently housed, the difference was about 4 months (a 93%

**Table 8.** MSH Engagement Measures on Checklist Completion (MSH Patient Only Sample).

Predictors	Total appt model		Arrival model		Cancelation model		No show model	
	Odds ratios	Std. Error	Odds ratios	std. Error	Odds ratios	Std. Error	Odds ratios	Std. Error
(Intercept)	0.34	0.19	0.42	0.21	0.31*	0.17	0.61	0.3
Appointments made	1.06*	0.03						
Arrivals			1.08*	0.04				
Cancelations					1.34*	0.16		
No Shows							1.15	0.13
Observations	37		37		37		37	
R <sup>2</sup> (McFadden's)	.12		.10		.16		.03	
AIC	48.88		49.91		47.24		53.64	

\*P < .05.



**Figure 3.** Predicted probability of completing the program checklist by MSH appointments (MSH patients only).

difference). To look more explicitly at differences across all housing situations (not just those independently housed vs not), we ran individual regressions on 4 subsamples defined by housing status. The results suggest that MSH care boosted program participation for those in independent housing and those in rehab/other similar housing situations, but not necessarily for those in transitional or emergency housing or those experiencing homelessness.

In summary, the regression analysis demonstrated that MSH care was associated with an increased likelihood of completing the CASH program, and this association strengthened with increases in the duration of MSH care and the degree of patient engagement. In addition, we found that the positive association of MSH care on program completion was mediated by, or operated through, the length of program participation. In other words, MSH patients engaged in the program longer than other participants, and as a result, they were more likely to complete the checklist. Moreover, we found that the extended length of participation among MSH patients was even stronger when those patients were in a stable and independent housing situation, suggesting that support services that work to secure housing

for those leaving trafficking are an important supplement to MSH care (Figure 5). The increased length of program participation among MSH patients likely has benefits in and of itself, although that was not the focus of this analysis.

**Survival analysis.** Among CASH program participants in the sample, 21 completed the goals set within the program checklist and 36 were marked as incomplete, meaning they had stopped responding/participating in the program for at least 6 weeks or were known to have returned to trafficking. We conducted survival analysis to examine program participants’ time-to-incompletion. Figure 6 presents the Kaplan-Meier probability estimates from this analysis, which showed that the probability of survival—in our case, program persistence (not being marked as incomplete)—decreased dramatically from 100% at enrollment to 47% at the 6-month mark. In fact, 83% of the 36 total incompletions occurred within the first 6 months of the program. Thus, during their first 6 months of engagement in the CASH program, participants were highly vulnerable to incompletion.

We then examined differences in the Kaplan-Meier survival curves of MSH patients compared to other program participants (Figure 7). The plotted survival curves show that the probability of program persistence was higher among MSH patients, compared to other participants, throughout their participation in the program. Indeed, 50% of other program participants were marked as incomplete at approximately the 3-month participation point, whereas it wasn’t until almost the 12-month point that 50% of MSH patients had been marked as incomplete. Results from the log-rank test confirmed that these differences were statistically significant ( $X^2 = 12.1$ ,  $P$ -value < .001).

We also plotted the survival curves for participants based on their noted healthcare provider, and again, MSH patients had a higher probability of persistence, compared to those treated by other providers or no provider at all, throughout most of their program participation (Figure 8). Log-rank

**Table 9.** MSH and Program Length on Checklist Completion.

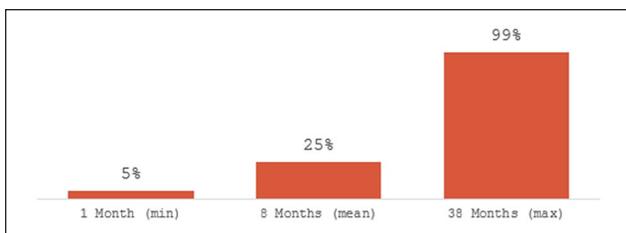
Predictors	Base model		MSH + Program Months	
	Odds ratios	Std. Error	Odds ratios	Std. Error
(Intercept)	0.18**	0.11	0.02***	0.02
MSH treatment	5.37*	3.8	1.36	1.31
CASH program length (months)			1.55***	0.18
Observations		57		57
R <sup>2</sup> (McFadden's)		.09		

\*P < .05. \*\*P < .01. \*\*\*P < .001.

**Table 10.** MSH on Program Participation Length.

Predictors	Base model			Healthcare model			Vulnerability/risk model			Demographic model		
	Coef	Std. Error	Std. Beta	Coef	Std. Error	Std. Beta	Coef	Std. Error	Std. Beta	Coef	Std. Error	Std. Beta
(Intercept)	4.08**	1.22	0	1.08	3.02	0	2.06	5.68	0	3.55	3.75	0
MSH treatment	5.01**	1.51	.41	6.21**	1.9	.47	6.72**	2.13	.51	4.08*	1.75	.35
Healthcare status scale				-.01	0.69	0						
Healthcare needs scale				.81	0.7	.17						
AOD addiction							-2.03	2.01	-.17			
Self-reported mental health concerns							2.58	2.7	.15			
High need							-1.9	2.21	-.15			
Trauma							.91	3.5	.04			
Trafficker risk							-.92	3.99	-.04			
Income source							3.45	4.3	.15			
Housing situation							2.97	2.85	.18			
Age (at CASH enrollment)										-.01	0.14	-.01
Race										1.61	1.72	.14
LGBT										.05	1.74	0
Married										-.15	3.01	-.01
High school education										.63	1.61	.06
Observations		57			41			40			54	
R <sup>2</sup> /R <sup>2</sup> adjusted		.17/.15			.26/.20			.313/.14			.18/.08	

\*P < .05. \*\*P < .01.



**Figure 4.** Predicted probability of CASH completion with duration of MSH participation for those with substance use disorders.

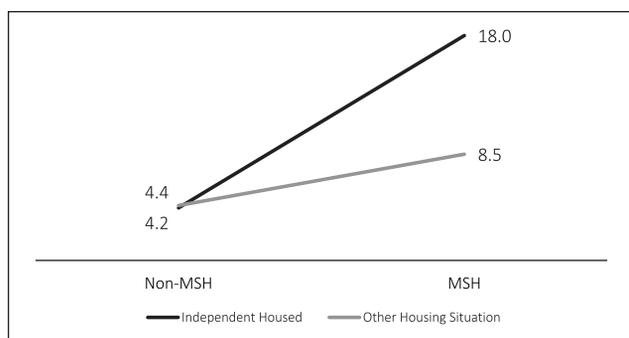
tests confirmed that there were statistically significant differences between groups, and that specifically, the curve for MSH patients was statistically different from that of participants being served by other providers (omnibus test, P-values < .01; pairwise comparisons, P-values < .05).

Finally, we estimated Cox Proportional-Hazard models to quantify the differences between MSH patients and other participants and to test whether the differences remained when covariates were included. As shown in Table 12, the hazard ratio for MSH patients was below 1, suggesting a reduced propensity—compared to other

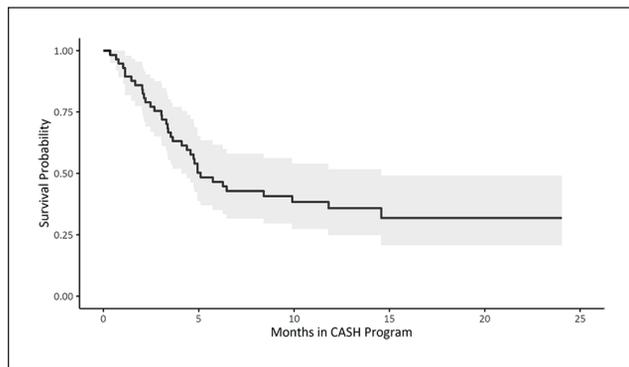
**Table 11.** MSH and Housing Status Interaction (and Supplemental Models).

Predictors	Full sample			Subset: Independently housed			Subset: Rehab/other housing			Subset: Transitional/emergency housing			Subset: Experiencing homelessness		
	Coef	SE	Std. Beta	Coef	SE	Std. Beta	Coef	SE	Std. Beta	Coef	SE	Std. Beta	Coef	SE	Std. Beta
(Intercept)	4.38**	1.57	.08	4.27*	1.71	0	4.57*	1.97	0	2.2	1.41	0	4.73	2.66	0
MSH treatment	4.09*	1.83	.44	13.73**	2.8	.89	5.20*	2.27	.39	.97	1.57	.33	.5	3.43	.08
Independently housed	-.12	2.82	.4												
Interaction term	9.64*	4.23	.28												
Observations	50			8			32			5			5		
R <sup>2</sup> /R <sup>2</sup> adjusted	.292/.246			.801/.768			.149/.120			.112/-.184			.007/-.324		

\*P < .05. \*\*P < .01.

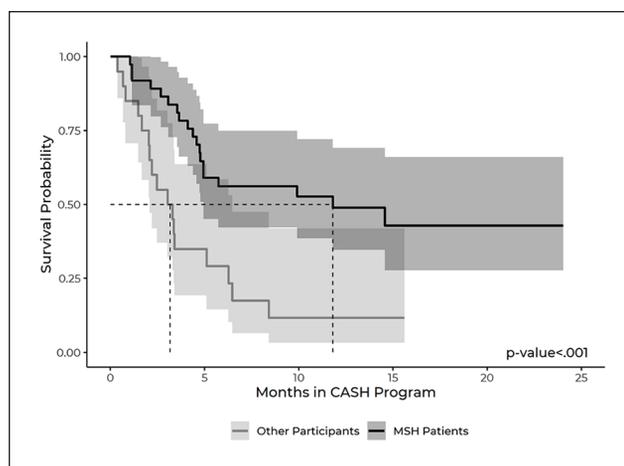


**Figure 5.** Differences in predicted program length (in months) due to MSH care by housing status.

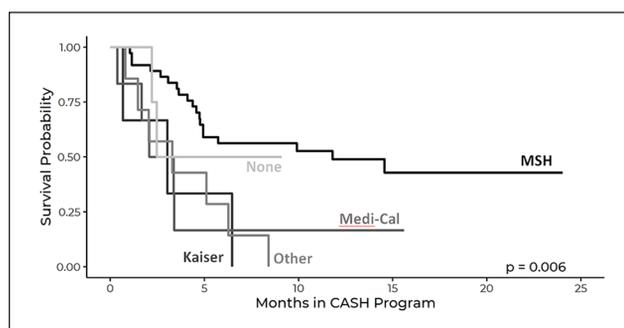


**Figure 6.** Kaplan-Meier curve for program incompletion.

program participants—to drop out of the CASH program (be marked as incomplete). Specifically, the risk of program incompletion was 68% lower for MSH patients compared to other participants at any particular point in time. When healthcare, vulnerability/risk, and demographic controls were included, this decreased risk remained about the same or expanded, as in the case of the healthcare and vulnerability/risk models.



**Figure 7.** Kaplan-Meier curves for program incompletion by MSH status.



**Figure 8.** Kaplan-Meier curves for program incompletion by healthcare provider.

We also ran Cox Proportional-Hazard models to quantify differences between those receiving care from MSH versus other providers. As shown in Table 13, at any particular point in time, the risk of program incompletion was almost

**Table 12.** Hazard Ratios From Cox Proportional-Hazards Models (MSH Models).

Characteristic	Base model	Healthcare model	Vulnerability/risk model	Demographic model
	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio
MSH treatment	0.32***	0.25**	0.15***	0.33**
Healthcare status scale		0.88		
Healthcare needs scale		0.92		
AOD addiction			2.01	
Self-reported mental health concerns			0.47	
High need			1.19	
Trauma			0.5	
Trafficker risk			2.53	
Income source			0.81	
Housing situation			0.7	
Age (at CASH enrollment)				0.98
Race				0.8
LGBT				0.87
Married				0.9
High school education				1.03

\*\* $P < .01$ . \*\*\* $P < .001$ .

**Table 13.** Hazard Ratios From Cox Proportional-Hazards Models (Provider Models).

Characteristic	Base model	Healthcare model	Vulnerability/risk model	Demographic model
	Hazard ratio	Hazard ratio	Hazard ratio	Hazard ratio
Provider				
Kaiser	3.9*	1.71	29.4*	3.01
Medi-Cal	3.33*	10.4**	6.71**	3.84*
Other	3.44*	5.77**	1.88	4.89**
None	1.68	1.96	7.25*	1.22
Healthcare status scale		0.97		
Healthcare needs scale		0.95		
AOD addiction			1.89	
Self-reported mental health concerns			0.3	
High need			1.12	
Trauma			0.45	
Trafficker risk			4.74	
Income source			0.45	
Housing situation			1.24	
Age (at CASH enrollment)				0.97
Race				0.67
LGBT				0.8
Married				1.07
High school education				0.84

\* $P < .05$ . \*\* $P < .01$ .

MSH was the reference category in this model.

4 times higher for Kaiser patients, and about 3 times higher for Medi-Cal and uninsured patients receiving care elsewhere compared to MSH patients. While the differences between Kaiser and MSH patients lost significance in some of the control models, Medi-Cal (California state Medicaid)

patients seen at FQHCs and Medi-Cal aligned clinics were consistently at a higher risk than MSH patients across all models. In sum, the results from the survival analysis demonstrated that MSH patients were at a decreased risk of program incompleteness compared to other participants.

## Discussion

To evaluate the efficacy of the MSH in facilitating success in the CASH program, and to identify participant characteristics at the time of CASH enrollment that may be associated with successful program completion, we conducted a retrospective analysis on data collected from 57 individuals enrolled in the CASH program, of whom 37 (64.9%) also obtained healthcare through the Medical Safe Haven program. Results demonstrated that 86% of participants who completed the CASH program checklist also received care at the MSH. MSH patients experienced significantly greater odds of successful CASH completion compared to other participants (5.37). Other demographic, risk and vulnerability, and health-related variables were not significantly different between those who completed or did not complete the CASH goals. Notably, medical care in other settings (outside of MSH) did not significantly increase the odds of completing the CASH goals. Additionally, the probability of persistence in the CASH program was significantly higher for MSH patients, especially in the initial few months. The authors theorize that the reasons for this latter finding may be secondary to mitigating the acute medical and psychiatric needs of this patient population, specifically in regards to management of complex PTSD coinciding with trauma bonding/trauma coerced—essentially buying time for patients to stabilize, receive trauma therapy, and start down roads of long term recovery from trafficking (a treatment paradigm described in article *Trauma-Coerced Attachment and Complex PTSD: Informed Care for Survivors of Human Trafficking*<sup>41</sup>). It is also possible that patients attending the MSH felt more engaged/safe with their provider, were able to have more services performed by 1 provider, obtained more holistic services, and/or responded well to the trauma-informed approach to care. Prior research with those who have experienced human trafficking suggests that trauma-informed interactions with health professionals are strongly desired, as is attention to a patient's myriad medical and non-medical needs.<sup>16,18,20</sup> To facilitate further interpretation of the results, future research may involve a detailed analysis of patient involvement in each of the medical settings (eg, patient attendance, types of services offered and types used most frequently, use of trauma-informed practices by staff) and input from patients about their respective experiences.

CASH program success also involved participants with substance abuse disorders and those completing a rehabilitation program. Among those with reported alcohol or other substance use disorders the odds of CASH completion increased by 25% for each additional month of MSH participation. In fact the predicted probability of CASH completion increased exponentially with duration of MSH participation. Successful completion of a substance abuse rehabilitation program with concurrent active participation in the MSH program requires considerable long-term

commitment to intensive services that are specifically designed for vulnerable populations, and that acknowledge and address the impact of trauma. The association of each of these 2 variables with completion of the CASH goals checklist suggests that a commitment to improving one's physical and mental health is important in establishing a more economically and socially stable lifestyle. Certainly, the CASH participants reported significant and extensive health issues, with 89% describing mental health concerns, 53% reporting substance addiction, and 61% needing physical healthcare. While results showed no significant association between CASH checklist completion and client health needs, a commitment to attending to one's health needs may be an important factor in enabling CASH involvement and success.

Completion of the CASH checklist was not significantly associated with vulnerability factors related to the participants' trafficker(s) (eg, threats, trafficker presence in the same city), or to participant basic needs, or their cumulative trauma score. Apparent lack of trafficker influence is somewhat surprising, given evidence that exploiters often exert significant control over the people they traffic,<sup>37</sup> and at times prevent access to professional assistance.<sup>20,21</sup> The authors theorize that the intentional education provided to patients at MSH on trauma bonding/trauma coerced attachment and complex PTSD as well as shared decision making on medication adjuncts to mitigate these conditions diminishes trafficker control and influence. Additionally, women who are no longer actively being exploited may have more control over their lives and day-to-day activities.

We found that participation in the MSH program increased the odds of completing the goals of the CASH program (checklist completion) by over 5 times (5.37). The association strengthened with increases in the duration of MSH care and degree of patient engagement. While this relationship is not necessarily a causal one, the positive association was found to be independent of control variables related to demographics (eg, age, gender, race/ethnicity, education level); a wide assortment of vulnerability factors related to sexual exploitation and basic needs, as well as health variables related to self-reported physical and mental healthcare and substance use, and healthcare needs. Further, MSH patients were involved in the CASH program for a longer duration than those who used other healthcare options or did not seek healthcare, and this relationship persisted even when control variables were considered. Both MSH involvement and likelihood of checklist completion were associated with duration of CASH participation and the latter appeared to mediate the relationship between MSH involvement and goal accomplishment (checklist completion). MSH patients were significantly less likely to cease CASH involvement (checklist incompleteness) than other CASH clients at any given point in time (eg, risk of program incompleteness 68% lower). MSH patients engaged in the program longer than other participants, and as a

result, they were more likely to complete the checklist. Moreover, we found that the extended length of participation among MSH patients was even stronger when those patients were in a stable and independent housing situation, suggesting that support services that work to secure housing for those leaving trafficking are an important supplement to MSH care. This is consistent with the literature showing an increased risk of exploitation and adverse outcomes associated with homelessness,<sup>42,43</sup> and the need to use a holistic approach when providing services to persons who have experienced trafficking.<sup>43</sup> A stable, reliable and acceptable source of primary medical care, and stable housing address 2 major sources of stress in the lives of vulnerable adults and children. Our study participants presented with high levels of health problems and needs, with 89% reporting mental health concerns, 86% a history of substance abuse, and 53% reporting an ongoing alcohol or drug addiction at the time of program enrollment. If individuals can address these needs they are able to turn to other challenges in their lives, financial independence, and immigration relief.

The trauma-informed approach to care is relatively new<sup>13</sup> and has a limited evidence base although is widely supported as a valuable strategy for working with vulnerable populations.<sup>44-47</sup> Studies of those who have obtained health and mental health care during periods of exploitation attest to the importance of the nonjudgmental, empathic, empowering, and transparent approach to patient interactions.<sup>16,22,23</sup> Individuals report that barriers to seeking healthcare and disclosing details of exploitation often center around concerns of healthcare provider bias and judgment, intolerance, and insensitivity as well as potential lapses in confidentiality. All of these conditions are directly contradictory to the trauma-informed approach to care.<sup>18-21,48,49</sup> The use of trauma-informed strategies by MSH staff may well contribute to building patient trust and encouraging ongoing involvement in health care, which may improve a client's ability to address other life challenges measured by the CASH checklist.

## Limitations

There are several limitations that should be considered when interpreting these findings. First, the small sample size prevented the inclusion of all control measures within the same model, impeding a parsimonious presentation of the findings and requiring comparisons of odds ratios across logistic regression models, the latter of which has been shown to be an imperfect practice.<sup>50</sup> It is possible that the apparent association between MSH involvement and CASH completion is mediated by an unknown variable not included in the control measures used here. A wide variety of demographic, health, and risk factors were included as our control measures, decreasing the likelihood of an unknown influential variable. However, small sample size may have masked the influence of 1 or more control

variables. Further research with larger sample sizes would address this possibility. Second, for the survival analysis, usually the non-event category—in our case not being marked as incomplete—would include censored cases, in other words, cases where the event had not happened yet at the time of follow-up but could happen afterward. In our data, those not marked as incompletes were marked as completes, and thus there were no censored cases, which is unusual in survival analysis. While this is unusual, it should not impede the effectiveness of the analysis.

All study participants were living in 1 region of the country at the time of data collection, and all participated in the CASH community assistance program. Only one of the study participants experienced labor trafficking (all others reported sex trafficking); only 1 reported non-female gender; and only 14% reported sexual orientation other than heterosexual. Thus, care should be taken not to generalize the study findings beyond the limits of this group of relatively young female, heterosexual adults receiving post-trafficking services in a specific location in California. Further research involving larger and more diverse samples is needed.

## Conclusions

There is a growing body of evidence indicating human trafficking is prevalent in our society; additional studies demonstrate that health care providers often interact with and care for individuals who are actively being exploited. Despite this data, there is a disquieting lack of education on this health care issue within the medical field, perhaps, in part, because of the absence of research that substantiates the advantage of such training. While there is general consensus that medical training in trauma-informed care techniques and education on trafficking has vast potential for benefiting patients, there is a paucity of objective data examining and quantifying patient-centered outcomes of applying these principles.

In this retrospective analysis, we evaluated the efficacy of trauma-informed primary care within the Medical Safe Haven Clinic (“MSH”) in facilitating successful completion of a community-based anti-trafficking victim service program (“CASH”) and identified participant characteristics associated with completion. Completion of the CASH checklist is correlated with significantly decreased rates of recidivism back to trafficking situations as evidenced by indicators such as minimal charges of re-offending following completion (3%). MSH patients experienced significantly greater odds of successful CASH completion compared to other participants (5.37). Moreover, the odds of completion grew incrementally alongside the length of MSH care and degree of patient engagement. Among those with reported alcohol or other substance use disorders the predicted probability of CASH completion increased exponentially with duration of MSH participation. The positive

association of MSH care on program completion was mediated by the length of CASH program participation; in other words, MSH patients stayed in the CASH program longer than other program participants, and longer participation was positively associated with program completion. The extended length of CASH program participation among MSH patients was even stronger among participants who had obtained a stable and independent housing situation. The risk of program incompleteness was 68% lower for MSH patients compared to other participants.

Adults who experience human trafficking report high rates of health and mental health concerns. Those receiving care at MSH are more likely to successfully complete the anti-trafficking community service CASH program than those who do not receive healthcare or who use alternative health systems. Study findings support the need for consistent, trauma-informed longitudinal healthcare for trafficked persons. Furthermore, the positive patient outcomes suggest that family medicine residency clinics, and potentially other primary care specialty residency clinics, may be a suitable environment for this patient care. The authors envision this as a replicable model that has the potential for low utilization, widespread care that concurrently trains the future primary care physician workforce to meet the unique needs of this vulnerable patient population.

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