

Literature Review

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Title: *The impact of connecting housing-insecure (HI) patients with substance use disorder (SUD) who visit the emergency department (ED) to housing and social care resources on patient health outcomes and healthcare utilization: A Literature Review*

Abstract: This literature review provides a summary of ten peer-reviewed journal articles to inform the proposed research study aimed at determining if connecting housing-insecure (HI) patients with substance use disorder (SUD) who visit the emergency department (ED) to housing and social care resources has a positive impact on patient health outcomes and healthcare utilization. Each article selected for this literature review has been assigned to five key categories broken down by their relationship to the proposed study's dependent and independent variables. The two categories included in the dependent variable section are health outcomes and healthcare utilization. The three categories included in the independent variables section are substance use disorder (SUD), housing insecurity (HI), also referred to as homelessness, and social care interventions. All selected articles directly contribute to the design of the proposed research study by identifying bright spots in the current research, essential considerations for the research design, and current gaps in the associated body of research. Each selected article has been summarized and synthesized in the context of the proposed study. The application of the reviewed literature contributes to the proposed study's intervention design and all associated data. The proposed study's findings will help inform future interventions implemented by the healthcare system to address the needs of this vulnerable population, thereby highlighting the potential benefits of the proposed interventions on patient health outcomes and healthcare utilization.

Literature Review Methods: A comprehensive search of academic databases, including Google Scholar and the Rutgers Newark Academic Library, was conducted. The search strategy focused on articles published between 2008 and 2021 that examined the proposed study's identified dependent and independent variables. Additional articles were considered through manual searches of reference lists from relevant studies. Search terms such as "housing insecurity," "homelessness," "substance use disorder," "emergency department," "housing resources," "health outcomes," "social care resources," "peer-based models," and "healthcare utilization" were utilized. The articles were selected from multiple fields of scholarship, which helped to gain various perspectives on the subject. These fields of scholarship included medical, administrative, social care, and substance use, which contained clinical, implementation, and outcome considerations.

Reviewed Literature - Dependant variables of the Proposed Study:

1. **Health outcomes:** The reviewed studies on the dependent variable of health outcomes demonstrate that health outcomes among patients with HI and SUD are poorer than the general population. Additional considerations include differences in the patient population that must be considered in the design of this proposed research study. The proposed research study will build

on the evidence presented in the studies below by offering research on possible interventions to address the health outcome studied.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 1. a	The Lancet Volume 391, Issue 10117, 20– 26 January 2018, Pages 241-250	Morbidity and mortality in homeless individuals, prisoners, sex workers, and individuals with substance use disorders in high-income countries: a systematic review and meta-analysis	Mixed methods: Systematic review and meta-analysis of studies published between January 2005, and October 2015, including systematic reviews, meta-analyses, interventional studies, and observational studies that had morbidity and mortality outcomes from high-income countries and were done in populations with a history of homelessness, imprisonment, sex work, or substance use disorder (excluding cannabis and alcohol use).
Citation	(Aldridge et al., 2018) https://www.sciencedirect.com/science/article/pii/S014067361731869X		

Purpose and Questions Asked: The study by (Aldridge et al., 2018) aimed to analyze and compare the morbidity and mortality rates in several marginalized populations, including homeless individuals, prisoners, sex workers, and people with SUDs in high-income countries. The study used a systematic review and meta-analysis approach to examine data from 38 previous studies. The study's primary questions were to determine the morbidity and mortality rates and causes of death in the targeted populations, compare these rates with the general population, and identify any trends or differences among the populations studied. (Aldridge et al., 2018)

Answers and Findings: The study by (Aldridge et al., 2018) found that all the populations studied, particularly females, more than males, had significantly higher morbidity and mortality rates than the general population. Specifically, homeless individuals and prisoners had higher rates of infectious diseases, while people with substance use disorders had higher rates of respiratory diseases and liver disease. The study also found that drug overdose was a significant cause of death among all four populations, with prisoners and homeless individuals having the highest rates. (Aldridge et al., 2018)

Hypothesis and Implications of Findings: The findings by (Aldridge et al., 2018) imply that the targeted populations, including patients with HI and SUD, face significant health challenges that require a multifaceted approach. The study highlights the need for healthcare interventions tailored to the specific needs of these populations and increased access to healthcare services. The study also emphasizes the need for policy changes that address the social determinants of health that contribute to poor health outcomes in these populations. (Aldridge et al., 2018)

Application to the proposed study: The study by (Aldridge et al., 2018) supports the need to provide comprehensive care for patients with SUD and HI by establishing the associated higher rates of morbidity and mortality. While the study by (Aldridge et al., 2018) helps to establish the need for services, it does not look at the feasibility or outcomes of interventions similar to those

proposed in this research study. The proposed research study will help to inform interventions to reduce the poor health outcomes established by the (Aldridge et al., 2018) study.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 1. b	Substance Abuse Volume 37, 2016 - Issue 4 Pages 534-541 18 Jul 2016	Substance use among persons with homeless experience in primary care	Mixed methods: The study by (Stringfellow et al., 2016) is a secondary data analysis from the Primary Care Quality—Homeless (PCQ-H) study. The PCQ-H study aimed to develop a survey to measure primary care experiences among homeless and formerly homeless patients. Health status was assessed by asking participants about lifetime diagnoses of 14 chronic medical conditions and diagnoses of 23 episodic health conditions in the past six months. These conditions are associated with mortality and health-related quality of life in homeless and substance-using adults.
Citation	(Stringfellow et al., 2016) https://www.tandfonline.com/doi/abs/10.1080/08897077.2016.1145616		

Purpose and Questions Asked: In the study by (Stringfellow et al., 2016), data were collected using a structured questionnaire administered to 898 individuals who presented for primary care services. The questionnaire included substance use, healthcare utilization, and demographic characteristics. The study provided evidence on substance use prevalence and patterns among homeless individuals and their healthcare utilization behaviors. The study by (Stringfellow et al., 2016) aimed to “describe a spectrum of lifetime and recent substance use, from any use to likely dependence, and to identify socio-demographic and health status characteristics associated with severity of use.” (Stringfellow et al., 2016)

Answers and Findings: The findings by (Stringfellow et al., 2016) showed that alcohol and tobacco were the most commonly used substances among the study participants, with 69.7% reporting past 30-day alcohol use and 77.2% reporting past 30-day tobacco use. Illicit drug use was also prevalent, with 45.8% of participants reporting past 30-day use. Marijuana was the most commonly used illicit drug, followed by cocaine and heroin. Regarding healthcare utilization, only 17.5% of participants reported having a regular healthcare provider. According to (Stringfellow et al., 2016), “high-risk respondents reported worse health and mental health status. They had the greatest psychological distress, scoring a standard deviation higher on the CSI compared with the lower-risk group. They reported more episodic health conditions. (...) The high-risk group also reported the lowest social support. In general, differences were greatest between the high- and lower-risk groups, with the moderate-risk group intermediate.” (Stringfellow et al., 2016)

Hypothesis and Implications of Findings: The study by (Stringfellow et al., 2016) suggests the need for primary care providers to screen for substance use among homeless individuals and to develop appropriate interventions to address substance use disorders and improve healthcare utilization. The findings also highlight the importance of integrating substance use treatment with primary care services for this vulnerable population. “Less severe use and past problematic use, which may be indicative of remitted SUDs,

were especially common in this diverse sample of homeless-experienced persons using primary care. These findings highlight the urgency of identifying effective ways to reduce risky substance use and prevent relapse in homeless-experienced persons, and may sensitize care teams to the importance of past problematic use as a relevant contextual factor in making health care decisions.”

(Stringfellow et al., 2016)

Application to the proposed study: The study by (Stringfellow et al., 2016) highlights a few critical considerations. First, the study by (Stringfellow et al., 2016) helps to establish the prevalence of SUD, with specifics on the substances used, by the sample population of HI patients. This helps to inform the proposed study on what the breakdown of SUD might look like in the proposed sample population. The second consideration focused on the stratification by (Stringfellow et al., 2016). The study by (Stringfellow et al., 2016) highlights the varying acuity in the various stratified populations. This helps to inform the proposed study, based on the assumption that patients that visit the ED might have higher acuity health needs than those that visit primary care settings, that patients in the ED will have more acute needs and poorer health outcomes than other healthcare settings. The third consideration focused on the low number of patients with HI and SUD who had an established relationship with a primary care provider. This consideration helps to inform the proposed study that ED utilization might be higher in this population, increasing ED utilization and limiting the available aftercare options for this patient population. Lastly, the study by (Stringfellow et al., 2016) helps to inform the proposed study on the importance of addressing a patient's HI and SUD needs as early as possible. The study by (Stringfellow et al., 2016) demonstrated better outcomes among lower-risk patients compared to higher risk. This consideration supports the need for the proposed intervention.

2. **Healthcare utilization:** The research on the dependent variable of healthcare utilization suggests that connecting patients with SUD and HI to housing and social care resources can decrease healthcare utilization. By incorporating the considerations highlighted below, the proposed research will help further inform the field of study on the impact of the proposed interventions on healthcare utilization.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 2. a	Western Journal of Emergency Medicine 2018 Nov; 19(6): 902–906. 2018 18 Oct	Substance Use, Homelessness, Mental Illness, and Medicaid Coverage: A Set-up for High Emergency Department Utilization	Mixed methods: The study conducted by (Moulin, Evans, Xing, & Melnikow, 2018) aimed to investigate the relationship between substance use, homelessness, mental illness, Medicaid coverage, and high emergency department (ED) utilization. The unit of analysis was individual patients who visited EDs in California during the year 2014. The study used a retrospective observational design and analyzed data from the State Emergency Department Database.
Citation	(Moulin et al., 2018) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6225935/		

Purpose and Questions Asked: The study by (Moulin et al., 2018) aimed to identify factors contributing to high ED utilization, particularly among vulnerable populations, and to inform policy and intervention strategies to reduce unnecessary ED use. In addition, the authors questioned whether substance use, homelessness, mental illness, and lack of Medicaid coverage are associated with high ED utilization. (Moulin et al., 2018)

Answers and Findings: The study by (Moulin et al., 2018) showed that patients with substance use disorders, homelessness, and mental illness were likelier to have high ED utilization than those without these conditions. Medicaid coverage was associated with lower ED utilization rates. The authors also found that patients with multiple conditions, such as substance use disorders and mental illness, had the highest rates of ED utilization. (Moulin et al., 2018)

Hypothesis and Implications of Findings: The study by (Moulin et al., 2018) hypothesized that substance use, homelessness, mental illness, and lack of Medicaid coverage are associated with high ED utilization. The findings supported this hypothesis and highlighted the need for targeted interventions to address the underlying causes of high ED utilization among vulnerable populations. Further, the implications of the findings suggest that addressing the root causes of high ED utilization, such as substance use disorders, mental illness, and homelessness, could lead to more effective and efficient use of healthcare resources. (Moulin et al., 2018) recommend that policymakers and healthcare providers prioritize interventions that address the social determinants of health, provide access to primary care and behavioral health services, and expand Medicaid coverage to reduce unnecessary ED use. (Moulin et al., 2018)

Application to the proposed study: The study by (Moulin et al., 2018) demonstrated that patients with SUD and HI have higher rates of utilization ED utilization. The study by (Moulin et al., 2018) also demonstrated that patients with SUD and HI, who are actively enrolled in Medicaid, had lower ED utilization rates. These considerations first help to inform that effective interventions that address a patient's SUD and HI will help to reduce ED utilization, thereby reducing healthcare costs. The study by (Moulin et al., 2018) also helps to inform the proposed research study on the effectiveness and importance of ensuring Medicaid enrollment and verification are essential interventions.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 2. b	Psychological Services, 14(2), 193–202	Cost of health care utilization among homeless frequent emergency department users	Quantitative: The article by (Mitchell, León, Byrne, Lin, & Bharel, 2017) aimed to examine the cost of healthcare utilization among homeless individuals who frequently use the emergency department (ED) for non-emergent issues. The study used a retrospective cohort design, analyzing Medicaid claims data from 2010 to 2013 for 2,657 homeless individuals in Massachusetts. The central units of analysis were healthcare costs, ED visits, hospitalizations, and outpatient care. The sample included 196 homeless individuals who made frequent ED visits (i.e., four or more visits per year). The data were collected from three large urban hospitals and included demographics, clinical diagnoses, and cost of care.
Citation	(Mitchell et al., 2017) https://psycnet.apa.org/doiLanding?doi=10.1037%2Fser0000113		

Purpose and Questions Asked: The study by (Mitchell et al., 2017) provides insight into the healthcare costs associated with frequent ED use among the HI population. The research questions included: “(1) What is the cost of health care utilization among homeless individuals who frequently use the ED for non-emergent issues? (2) What factors are associated with higher healthcare costs among this population?” (Mitchell et al., 2017)

Answers and Findings: The study by (Mitchell et al., 2017) found that patients with HI, who frequently used the ED, had significantly higher healthcare costs compared to those who did not use the ED frequently. The mean cost per person per year was \$27,129 for frequent ED users, compared to \$8,108 for non-frequent users. The study by (Mitchell et al., 2017) also found that the factors associated with higher healthcare costs were mental health disorders, substance use disorders, and chronic medical conditions. Mental health and SUD diagnoses were the most common among homeless frequent ED users and were associated with higher costs of care. (Mitchell et al., 2017)

Hypothesis and Implications of Findings: The study by (Mitchell et al., 2017) hypothesized that addressing the underlying causes of frequent ED use, such as mental health and SUD, could reduce healthcare costs and improve outcomes for homeless individuals. They also suggested that interventions targeting these issues could be delivered through coordinated care models that involve primary care providers, mental health providers, and substance abuse treatment programs. Overall, the study highlights the high cost of healthcare utilization among HI frequent ED users and the need for interventions that address the underlying causes of frequent ED use in this population. (Mitchell et al., 2017)

Application to the proposed study: The study by (Mitchell et al., 2017) further supports the higher-than-average healthcare costs for HI patients. These higher costs help to demonstrate further the need to identify and financially support ED-based interventions to address HI. The study by (Mitchell et al., 2017) also establishes the correlation between SUD and HI, including the positive impact

interventions focused on SUD and HI, can have on the target population. The evidence presented by (Mitchell et al., 2017) confirms the need for the proposed research project.

Reviewed Literature - Independent variables of the Proposed Study:

3. **Substance Use Disorder:** The research reviewed related to the independent variable of SUD further supports the need to research interventions to address SUD in the ED setting. In addition, the research outlined below provides multiple baseline data points for the proposed study to compare.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 3. a	Psychiatric Quarterly volume 87, pages 713–728 (2016) 13 Feb 2016	Factors Influencing the Frequency of Emergency Department Utilization by Individuals with Substance Use Disorders	Mixed methods: The study by (Huynh, Ferland, Blanchette-Martin, Ménard, & Fleury, 2016) aimed to investigate the factors associated with emergency department (ED) utilization among individuals with substance use disorders (SUDs). The units of analysis were adult patients with SUDs who visited the ED at least once within a year. The data were collected using a retrospective chart review of patients who visited four EDs in Montreal, Canada, between 2008 and 2012.
Citation	(Huynh et al., 2016) https://link.springer.com/article/10.1007/s11126-016-9422-6		

Purpose and Questions Asked: The study by (Huynh et al., 2016) aimed to answer several research questions related to the frequency of ED utilization among patients with SUDs. These questions included identifying the socio-demographic and clinical characteristics of patients with SUDs who visit the ED frequently, examining the impact of comorbid psychiatric and medical conditions on ED utilization, and identifying the type and frequency of substance-related problems that lead to ED visits. (Huynh et al., 2016)

Answers and Findings: The study by (Huynh et al., 2016) found that patients with SUDs with comorbid psychiatric and medical conditions were more likely to visit the ED frequently. More specifically, patients with a history of injection drug use, alcohol-related problems, or respiratory or infectious diseases were also more likely to visit the ED frequently. The study by (Huynh et al., 2016) also found that the most common reasons for ED visits among patients with SUDs were alcohol-related problems, followed by drug-related problems and mental health issues. (Huynh et al., 2016)

Hypothesis and Implications of Findings: The study by (Huynh et al., 2016) hypothesized that the findings suggest a need for better integration of primary care and addiction services to reduce ED utilization by patients with SUDs. They also suggest that interventions targeting patients with comorbid medical and psychiatric conditions could help reduce ED utilization. In summary, the study by (Huynh et al., 2016) provides essential insights into the factors influencing ED utilization by patients with SUD,

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highlighting the need for more integrated care and interventions targeting patients with complex medical and psychiatric needs.

(Huynh et al., 2016)

Application to the proposed study: The study by (Huynh et al., 2016) not only informs the proposed research study on specific details regarding the types of ED utilization by patients with SUD, but it also highlights the importance of developing interventions to address the needs of patients with SUD. In addition, the proposed research study will add to this body of research by applying the (Huynh et al., 2016) study findings on the impact of integrated primary care to integrating care in the ED setting.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 3. b	Annals of Epidemiology Volume 32, April 2019, Pages 1-6.e1	Impact of supportive housing on substance use–related health care utilization among homeless persons who are active substance users	Mixed methods: The study by (Miller-Archie, Walters, Singh, & Lim, 2019) examined the impact of supportive housing on substance use-related healthcare utilization among homeless individuals who were active substance users. The study used a quasi-experimental design with two units of analysis: a treatment group that received supportive housing and a control group that did not. Data were collected through administrative records from a large urban healthcare system.
Citation	(Miller-Archie et al., 2019) https://www.sciencedirect.com/science/article/abs/pii/S1047279718310469		

Purpose and Questions Asked: The study by (Miller-Archie et al., 2019) aimed to determine whether supportive housing would reduce substance use-related healthcare utilization among homeless individuals who were active substance users. (Miller-Archie et al., 2019)

Answers and Findings: The study by (Miller-Archie et al., 2019) found that supportive housing significantly reduced substance use-related hospitalizations and emergency department visits. Patients who received supportive housing were 42% less likely to have a substance use-related hospitalization and 44% less likely to have a substance use-related emergency department visit than those in the control group. (Miller-Archie et al., 2019)

Hypothesis and Implications of Findings: The study by (Miller-Archie et al., 2019) hypothesized that providing stable housing would decrease the need for ED visits and hospitalizations for SUD-related issues. The implications of these findings suggest that providing supportive housing for homeless individuals who are active substance users can significantly reduce healthcare utilization related to SUD. This, in turn, can reduce healthcare costs and improve health outcomes for this vulnerable population. (Miller-Archie et al., 2019)

Application to the proposed study: The study by (Miller-Archie et al., 2019) provides direct support and correlation to the proposed research study. The results of the study by (Miller-Archie et al., 2019) will be used as primary evidence of the need for the proposed

research study's intervention. The study by (Miller-Archie et al., 2019) will also provide comparative data to measure the proposed research study.

4. **Housing insecurity:** The research related to the independent variable of HI further supports the need to research interventions to address HI in the ED setting. The research outlined below provides multiple baseline data points for the proposed study to compare.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 4. a	Australian Social Work Volume 61, 2008 - Issue 4 Pages 342- 356 20 Nov 2008	Homelessness and Substance Abuse: Which Comes First?	Mixed methods: The article by (Johnson & Chamberlain, 2008) explores the relationship between homelessness and substance abuse, specifically whether substance abuse leads to homelessness or vice versa. The study's unit of analysis is individuals who are homeless and have substance abuse issues. It is based on a qualitative analysis of data collected through in-depth interviews with 25 participants recruited from homeless shelters and rehabilitation programs in Melbourne, Australia.
Citation	(Johnson & Chamberlain, 2008) https://www.tandfonline.com/doi/abs/10.1080/03124070802428191		

Purpose and Questions Asked: The study by (Johnson & Chamberlain, 2008) aimed to examine the link between HI and SUD and determine whether substance abuse preceded or followed homelessness. The (Johnson & Chamberlain, 2008) study asked questions about the participants' history of substance abuse, their experiences of homelessness, and the factors that contributed to their situations. The research questions include: "What are the reasons for homelessness among people with substance abuse issues? What are the patterns of substance use and abuse among homeless people? Which comes first, homelessness or substance abuse?" (Johnson & Chamberlain, 2008)

Answers and Findings: The study by (Johnson & Chamberlain, 2008) found a complex relationship between SUD and HI. The findings by (Johnson & Chamberlain, 2008) suggested that SUD and HI are closely linked, with SUD often preceding HI. Participants reported that SUD contributed to their employment, relationships, and housing loss. Additionally, they reported that SUD continued or increased during periods of HI. For some participants, SUD preceded their HI, while for others, it was the other way around. Some participants experienced a cycle of SUD and HI, where their addiction led to them losing their homes, perpetuating their SUD. The study by (Johnson & Chamberlain, 2008) also found that mental health issues, poverty, and social isolation significantly contributed to HI and SUD. (Johnson & Chamberlain, 2008)

Hypothesis and Implications of Findings: The (Johnson & Chamberlain, 2008) study hypothesized that SUD and HI are interrelated and cannot be treated independently of each other. (Johnson & Chamberlain, 2008) argues that interventions focusing on SUD or HI may only be effective if they address both issues simultaneously. The (Johnson & Chamberlain, 2008) study's

implications suggest that policy and practice should provide integrated services that address homeless individuals' SUD and HI needs. The study by (Johnson & Chamberlain, 2008) also highlights the need for more comprehensive and integrated support services for HI patients with SUD issues, including access to stable housing, mental health services, and SUD treatment. (Johnson & Chamberlain, 2008)

Application to the proposed study: The study by (Johnson & Chamberlain, 2008) highlights an important consideration for the proposed study. While SUD often happens first and is a driver of HI, the study by (Johnson & Chamberlain, 2008) demonstrates the need for SUD and HI to be addressed comprehensively and coordinatedly. Patient choice and readiness will be essential factors in the proposed research. However, the study by (Johnson & Chamberlain, 2008) highlights the relationship between the two primary needs of the proposed patient sample.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 4. b	Drug and Alcohol Dependence Volume 188, 1 Jul 2018, Pages 328-333	Substance use and homelessness among emergency department patients	Mixed methods: The study by (Doran et al., 2018) aimed to explore the relationship between substance use and homelessness among emergency department (ED) patients. The unit of analysis was individual ED patients who participated in the study. The researchers collected data from 607 ED patients in Los Angeles County who completed a self-administered survey. The survey included questions about demographics, substance use, housing status, and health status.
Citation	(Doran et al., 2018) https://www.sciencedirect.com/science/article/abs/pii/S0376871618302849		

Purpose and Questions Asked: The study by (Doran et al., 2018) aimed to examine the prevalence and patterns of substance use among ED patients who were homeless, marginally housed, or stably housed. The study by (Doran et al., 2018) also aimed to identify factors associated with SUD and HI among these patients. According to (Doran et al., 2018), “while our study was exploratory, we hypothesized that ED patients experiencing homelessness would have higher rates of substance use and greater substance use severity than other patients.” (Doran et al., 2018)

Answers and Findings: The study by (Doran et al., 2018) found that SUD was significantly more prevalent among homeless and marginally housed patients than stably housed patients. (Doran et al., 2018) also found that HI was significantly associated with SUD, even after controlling for age, gender, and health status. The study by (Doran et al., 2018) “found that patients experiencing homelessness were more likely than other patients to report that their ED visit was related to substance use (...) Patients experiencing homelessness have higher rates and greater severity of alcohol and drug use than other ED patients across a range of measures. These findings have implications for planning services for patients with concurrent substance use and housing problems.” (Doran et al., 2018)

Hypothesis and Implications of Findings: The (Doran et al., 2018) study supports the hypothesis that HI and SUD are closely linked. (Doran et al., 2018) suggests that EDs could be a valuable setting for identifying and addressing SUD and HI among vulnerable populations. These findings imply that interventions to reduce SUD and HI should simultaneously target both issues. (Doran et al., 2018) expressly point out that “the subset of ED patients who are chronically homeless and have severe substance use disorders likely needs intensive interventions that include case management, connections to housing, and robust substance use treatment” (Doran et al., 2018)

Application to the proposed study: The study by (Doran et al., 2018) further supports the need and design of the proposed research study. Similar to the study by (Miller-Archie et al., 2019), the study by (Doran et al., 2018) provides robust comparative data which can be used further to measure the impact of the proposed research study.

5. **Social care interventions:** The research reviewed related to the independent variable of social care interventions further supports using a peer-based model in the proposed research study. To best contribute to the current body of research, the role within healthcare that will implement the proposed interventions is shown to be equally important as the intervention itself.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 5. a	Substance Use & Misuse Volume 53, 2018 - Issue 13 19 Apr 2018	Emergency Department Visits in a Cohort of Persons with Substance Use: Incorporating the Role of Social Networks	Mixed methods: The article by (Sacamano, Krawczyk, & Latkin, 2018) examined the relationship between social networks and emergency department (ED) visits among persons with substance use. The unit of analysis was a cohort of 420 individuals with a history of substance use recruited from Baltimore, Maryland. The data were collected through structured interviews and self-reported ED visits over a 12-month period.
Citation	(Sacamano et al., 2018) https://www.tandfonline.com/doi/abs/10.1080/10826084.2018.1461225		

Purpose and Questions Asked: The study by (Sacamano et al., 2018) aimed to investigate whether social networks play a role in ED visits among individuals with SUD. Specifically, (Sacamano et al., 2018) sought to determine whether social network factors, such as network size and composition, were associated with ED visits after controlling for individual-level factors. (Sacamano et al., 2018)

Answers and Findings: The study by (Sacamano et al., 2018) found that individuals with larger social networks and those with more drug-using network members were more likely to have multiple ED visits after controlling for individual-level factors such as age, sex, and drug use severity. However, social network factors were not significantly associated with single ED visits. (Sacamano et al., 2018)

Hypothesis and Implications of Findings: The study by (Sacamano et al., 2018) hypothesized that social networks would significantly impact ED visits among individuals with SUD. The (Sacamano et al., 2018) study's implications suggest that interventions that modify social network factors may help reduce ED visits among individuals with SUD. This may include targeting network members who are heavy drug users or increasing social support from non-drug-using network members. The study by (Sacamano et al., 2018) highlights the importance of considering social network factors when developing interventions to reduce ED visits among individuals with SUD. (Sacamano et al., 2018)

Application to the proposed study: The proposed research study includes the use of peer-based Community Health Workers (CHW). The study by (Sacamano et al., 2018) demonstrates the value of considering social networks in the proposed research design. The evidence presented by (Sacamano et al., 2018) will be used to support the proposed research study's inclusion of peers into its design. The proposed research study will help support the body of evidence related to peer-based models and the supportive social networks they create and strengthen.

Article #	Date and Journal	Title	Units of Analysis and Methods of Data Collection
Article 5. b	The American Journal of Drug and Alcohol Abuse Encompassing All Addictive Disorders Volume 47, 2021 - Issue 2 20 Nov 2020	Implementing hospital-based peer recovery support services for substance use disorder	Mixed methods: (Liebling, Perez, Litterer, & Greene, 2021) describes the implementation of the Peer Recovery Program, which delivers recovery support services 24 hours a day, seven days a week, for patients with SUD in emergency departments and inpatient settings across 20 hospitals in NJ. (Liebling et al., 2021) report program, patient, and referral characteristics and program process measures. From 2016 to 2019, Recovery Specialists received referrals during 30,263 patient visits. In 2019, Recovery Specialists and Patient Navigators attempted 113,442 follow-up contacts, and patients accepted 4,696 referrals provided by Patient Navigators for substance use disorder treatment and other medical, social, and recovery services and supports.
Citation	(Liebling et al., 2021) https://www.tandfonline.com/doi/abs/10.1080/00952990.2020.1841218		

Purpose and Questions Asked: (Liebling et al., 2021) conducted a study on implementing peer recovery support services for patients with SUD in a hospital setting. The study by (Liebling et al., 2021) aimed to explore the feasibility and effectiveness of implementing peer recovery support services in a hospital-based setting for patients with SUD.

Answers and Findings: The study by (Liebling et al., 2021) found that implementing peer recovery support services in a hospital setting was feasible and beneficial for patients with SUD. The peer recovery specialists were able to provide emotional support, practical assistance, and advocacy for patients. As a result, the patients reported feeling more supported and less isolated and were more likely to engage in treatment and recovery activities. However, the study also identified several challenges to implementing peer support services, including staff resistance, lack of funding, and limited resources. However, (Liebling et al., 2021) suggest that

these challenges can be addressed through education, training, advocacy, and collaboration with community partners. (Liebling et al., 2021)

Hypothesis and Implications of Findings: The study by (Liebling et al., 2021) hypothesized that hospital-based peer recovery support services would be feasible and effective in supporting patients with SUD. The findings support this hypothesis and have implications for developing and implementing peer recovery support services in the hospital setting. (Liebling et al., 2021) recommend that hospitals consider integrating peer recovery support services into their existing programs and services to improve outcomes for patients with SUD. (Liebling et al., 2021)

Application to the proposed study: The study by (Liebling et al., 2021) provides a foundational body of evidence supporting the design of the proposed research study. The proposed research study will build on the findings of (Liebling et al., 2021) by incorporating education, training, advocacy, and collaboration with community partners into its design.

Overall Summary of Findings: All studies reviewed in this literature review support that connecting HI patients with SUD who visit the ED to housing and social care resources can positively impact patient health outcomes and healthcare utilization. While the reviewed studies were categorized by their primary topics in relation to the dependent and independent variables of the proposed study, each study included additionally related variables as well as key considerations for the proposed intervention. To provide a concise overview of the current body of research, below is a summary of the findings found in this literature review:

- Health outcomes are poorer among patients with SUD and/or HI.
- Interventions focused on comprehensively addressing SUD and HI-related issues among patients show promise of having a positive impact on health outcomes.
- Patients with SUD and HI demonstrate higher-than-average healthcare utilization.
- Research supports that interventions focused on comprehensively addressing SUD and HI-related issues will reduce high-cost healthcare utilization.
- Patients with SUD frequently use the ED as a primary source of healthcare.
- Patients with SUD have low utilization rates of primary care.
- Interventions focused on addressing SUD-related issues early are more effective.
- SUD is directly associated with HI; more specifically, SUD often increases the risk and acuity of HI.
- ED-based interventions addressing low, mid, and high-risk HI are effective.

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- Peer-based interventions, such as those provided by CHWs or peer recovery specialists, are an effective tool in addressing SUD.
- Peer-based models have an associated outcome of increasing a patient's social network, thereby increasing the likelihood of long-term recovery for patients with SUD.

Limitations and Future Research: Some limitations of the literature reviewed include a lack of studies including interventions specific to the target population in the ED setting. Due to the need for more research on the proposed intervention, there currently needs to be more research that includes randomized controlled trials similar to the proposed research study. In addition, further research is needed to identify the most effective strategies for connecting HI patients with SUD to housing and social care resources and understand the long-term effects.

Conclusion: Connecting HI patients with SUD who visit the ED to housing and social care resources is a promising approach to improving patient health outcomes and reducing healthcare utilization. Further research is needed to determine the most effective strategies, at the right point in the continuum of care, for connecting patients to these resources, including identifying all potential implementation barriers. Overall, the approach included in the proposed research study could improve the lives of HI patients with SUD and reduce the burden on the healthcare system, thereby positively impacting public health.

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