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Exploring Health Inequities: Head Injuries in People Experiencing Homelessness

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Abstract

Lifetime occurrence of head injury is disproportionately affecting people experiencing homelessness in Canada. Head injury in people experiencing homelessness is associated with victimization, housing instability and substance use (Topolovec-Vranic et al., 2017). However, individual factors including gender, race, social class and disability also produce social and health inequities which may have intersectional impacts on this population (McCall, 2005). Through secondary exploration of data from the No Fixed Address Version 2 (NFAv2) and No Fixed Address Version 2x (NFAv2x) studies (Forchuk et al., 2020 & 2021), and an intersectional lens, the purpose of this study was to explore relationships between individual factors as well as risks in relation to head injury in people experiencing homelessness. Four of the independent variables were statistically significant in the binary logistic regression model including; education, mental health issues, physical health issues and victimization. Findings help to explain multiple inequities faced by people experiencing homelessness that shape their experiences with head injury. Further research is needed to develop a greater understanding of head injury in people experiencing homelessness.

Keywords

Head injury, homelessness, victimization, education level, mental health, physical health.

Summary for Lay Audience

People experiencing homelessness are more likely to have a head injury than the rest of the population. Most head injuries in this population are caused by assault or victimization. This may be associated with a number of factors such as psychiatric diagnosis, housing stability, relationships with family and others, substance use, or personal safety. Head injuries in people experiencing homelessness may also be associated with impaired cognition and health service use. The theory of intersectionality suggests that intersections of a person's identity may overlap to cause further disadvantage to an individual. The core identities associated with intersectionality include sex, race, class, and disability which together marginalize and oppress certain populations. In this study we explored the relationships between sex, race, class, disability, housing instability, substance use and victimization. Relationships were found between disability, education and victimization and head injuries in people experiencing homelessness. Participants who reported having a head injury were 13 times more likely to also report being a victim of a violent crime in the past year. Participants who had completed less than high school education were more likely to report a head injury in their lifetime. participants who reported having a mental health issue in the past year were 7.6 times more likely to report a head injury in their lifetime. Finally, participants who reported having a physical health issue in the past year were 5.6 times more likely to report a head injury in their lifetime. In conclusion, there is a need for better follow-up care and long-term support of people who have experienced a head injury in their lifetime as it is associated with ongoing health issues and victimization. Education systems must also be aware of this association as accommodation and supports in schools may be required for people who have a head injury. In nursing, it is important for people experiencing homelessness to be assessed for head injury at each contact with the healthcare system due to the high rates of head injury in this population.

Co-Authorship Statement

Emily Angus completed the following work under the supervision of Dr. Cheryl Forchuk and advisement of Dr. Michael Kerr, who will be co-authors on the publication resulting from this manuscript.

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I dedicate this thesis to my grandmother, Isabel Tasker, the original nurse of my family.

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Chapter 1

1 Introduction

1.1 Background and Significance

Head injuries produce a significant morbidity and mortality in Canada (Public Health Agency of Canada [PHAC], 2020). The effects of head injury are far reaching; affecting individuals, families, communities and societies. Severity of head injury can range from mild to severely debilitating (Li et al., 2021). Even a mild head injury can cause changes in the structure and function of the brain, limit one's ability to perform activities or restrict an individual's capacity to participate in society including education, and employment (Li et al., 2021). Primary causes of head injuries include falls, motor vehicle accidents, sports, and violence (Topolovec-Vranic et al., 2014). In people experiencing homelessness, the most common cause of head injury is assault (Gargaro et al., 2016).

For people experiencing homelessness, heath inequities such as head injury are bidirectional (Cusimano et al., 2021). Approximately 70- 90% of people experiencing homelessness experienced a head injury prior to experiencing homelessness initially, therefore head injury is a predictor for people experiencing homelessness (Cusimano et al., 2021; Hwang et al., 2008; Oddy et al., 2012; Topolovec-Vranic et al., 2014). Head injury is also a consequence of experiencing homelessness as people experiencing homelessness are more likely to sustain a head injury compared to the general population (Barnes et al., 2015; Cusimano et al., 2021; Nikoo et al., 2017; Svodoba & Ramsay, 2015). Furthermore, the root cause of health inequities such as head injury often results from social inequities such as social exclusion, poverty and homelessness (Luchenski et al., 2018). For conditions such as head injury, an upstream approach is required to focus on prevention rather than a downstream focus on treatment and rehabilitation, as many people who experience a head injury are severely impacted and are unable to work again (Ontario Brain Injury Association, 2012).

Head injuries are influenced by a number of factors which determine the risk of someone sustaining a head injury, as well as the type, severity of and recovery from the head injury. Substance use and addiction are often associated with head injury in people experiencing homelessness, which can include substance use of the perpetrator, the victim, or both exacerbating the violence leading to head injury (Pritchard et al., 2019). Head injury may also be caused by assault secondary to robbery or mugging and is therefore financially motivated (Cusimano et al., 2021). Housing instability is associated with occurrence of head injury in people experiencing homelessness, this may be due to rough sleeping outdoors or accepting offers of shelter in exchange for sex (Heerde & Pallotta-Chiarolli, 2020). Victimization occurrence throughout the lifetime is also associated with head injury in people experiencing homelessness (Heerde & Pallotta-Chiarolli, 2020; Pritchard et al., 2019). Experiences of adverse childhood events may have resulted in head injury prior to experiencing homelessness, but also may establish deeply entrenched social and health risk behaviours. These social and health behaviours such as aggression and recklessness in adulthood may contribute to head injury and ongoing violence in people experiencing homelessness (Cusimano et al., 2021; Pritchard et al., 2019). In addition, in people experiencing homelessness, frequent acts of violence witnessed in their environment may normalize this experience therefore individuals become unresponsive and disassociated from the emotions related to violence (Heerde & Pallota-Chiarolli. 2020).

Demographically, men are more likely to have a head injury than women (Hanafy et al., 2020; Hwang et al., 2008; Yue et al., 2020). However, women are more often victims of intimate partner violence or family violence and less likely to accept follow-up care (Hanafy et al., 2020; Pritchard et al., 2019). Indigenous (Linton, 2015; Topolovec-Vranic at al., 2017) and Caucasian (Guinn et al., 2018; Hwang et al., 2008; Mejia-Lancheros et al., 2020) backgrounds are the most commonly represented ethnic groups. Ethnicity and race may influence the level of violence and extent of head injury, particularly in family violence (Pritchard et al., 2019). Most people who have a history of head injury are unemployed or have an income of less than $ 25,000 dollars per year (Guinn et al., 2018) and have not completed a high school education (Topolovec-Vranic et al., 2017). Income and education are two parameters often used to quantify socioeconomic status (Mohd

Saleem, 2020). People with low socioeconomic status or social class may have low income and education levels and are often stigmatized, marginalized and oppressed due to lack of socioeconomic power which may contribute to the context of head injury in people experiencing homelessness (Pritchard et al., 2019).

1.2 Study Purpose

The purpose of this study is to test for relationships between possible risk factors of gender, race, class (including education ad income), disability, housing instability, substance use and victimization with self-reported lifetime history of head injury in people experiencing homelessness.

2 Theoretical Background

2.1 Intersectional Theory

There are many complex social factors and that are associated with head injury in people experiencing homelessness, it is important to understand the context in which they are found which may be better understood through an intersectional lens (Gargaro et al., 2016; Pritchard et al., 2019). Intersectionality is a theory with additions from; legal, feminist, ethnic and queer studies, as well as sociology, philosophy, anthropology and nursing (Cho et al., 2013). Intersectionality theory and analysis assumes that categories of identity are interdependent and can exacerbate each other, therefore they can and should not be understood in isolation (Heard et al., 2019). In addition, consideration of power imbalances with regards to intersecting identities and the context in which they are experienced must be explored with a focus on advancing health and justice (Heard et al., 2019). Power imbalances in particular can exacerbate oppressive forces from societal structures, institutions and social hierarchies. In this study, each participant is experiencing housing instability. In addition, other social identities including gender, race, education, income, mental and physical ability, housing instability, substance use and victimization are also simultaneously influencing individual's experiences. Using in intra-categorical approach to Intersectionality theory, this study will provide insight and

contextualize the intersecting identities in which people experiencing homelessness are experiencing head injury.

3 Conclusion

Intersectionality theory requires deep interpretation of variables as the intersections are complex and together exacerbate social and health inequities across the lifespan. In people experiencing homelessness, marginalization and oppression are already occurring due to the circumstance of their housing situation. In addition, intersections of other oppressive identities have multiplicative effects that may put people experiencing homelessness at even higher risk for head injury. The current study utilized a logistic regression model to explore cross sectional, secondary data including the dependent variable self-reported lifetime head injury. Significant findings between variables will be discussed and potential implications and recommendations made. In Chapter 3, nursing implications will be discussed as well as policy recommendations and recommendations for future research. It is important for healthcare and other services to create a culturally sensitive environment in which individuals are supported and therefore able to achieve and maintain health. Upstream approaches to healthcare may target poverty, housing and victimization as important approaches to reducing social and health inequities from the source.

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Chapter 2

4 Exploring Health Inequities: Head Injuries in People Experiencing Homelessness

More than 38,000 Canadians seek emergency care for head injury each year (Public Health Agency of Canada [PHAC], 2020). Approximately 10% of those who seek care for head injury will die from that injury (PHAC, 2020). Head injury is defined as an injury to the head from trauma, such as a blow to the head, scalp laceration or loss of consciousness (Teasdale, 1995). Head injury can be sustained from potentially preventable causes such as falls, motor vehicle accidents, sports-related injuries, or violence (Barnes et al., 2015; PHAC, 2014). Symptoms of head injury range from mild to severely disabling with the latter placing excessive burden on affected individuals, their families, society and the healthcare system (Maas et al., 2017).

Housing instability is both a predictor and an outcome of head injury (Barnes et al., 2015; Hwang et al., 2008). Head injury prevalence in people experiencing homelessness is much higher compared to the general population (Ang & Wasserman, 2021; McMillan et al., 2015; Song et al., 2018). High rates of head injury (53-60%) are found in this population (Hwang et al., 2008; Nikoo et al., 2017). Head injury places individuals at high risk for experiencing homelessness due to the increased complexity of housing that some individuals require post-head injury. The resources and funding are often not available; therefore, some of these individuals are unable to find suitable housing (Jackson, 1994). Head injury is not usually an isolated incident in people experiencing homelessness, as initial head injury puts an individual at higher risk for subsequent head injury (Nikoo et al., 2017) Additionally, adverse outcomes such as cognitive impairments, mental illness exacerbations, increased alcohol and other drug use, and increased health and justice system use are associated with head injury in people experiencing homelessness (Andersen et al., 2014; Luong et al., 2021; Topolovec-Vranic et al., 2017).

Risk factors for head injury in people experiencing homelessness are multifactorial: substance abuse (Gargaro et al., 2016; Nikoo et al., 2017; Thompson et al., 2020),

psychiatric diagnosis and adverse childhood experiences (Adshead et al., 2019; Ma et al., 2019; Song et al., 2018), as well as structural, social, and environmental factors such as relationships with family and others, housing stability, personal safety and health service use were all found to affect its occurrence (Pritchard et al., 2019).

5 Theoretical Framework

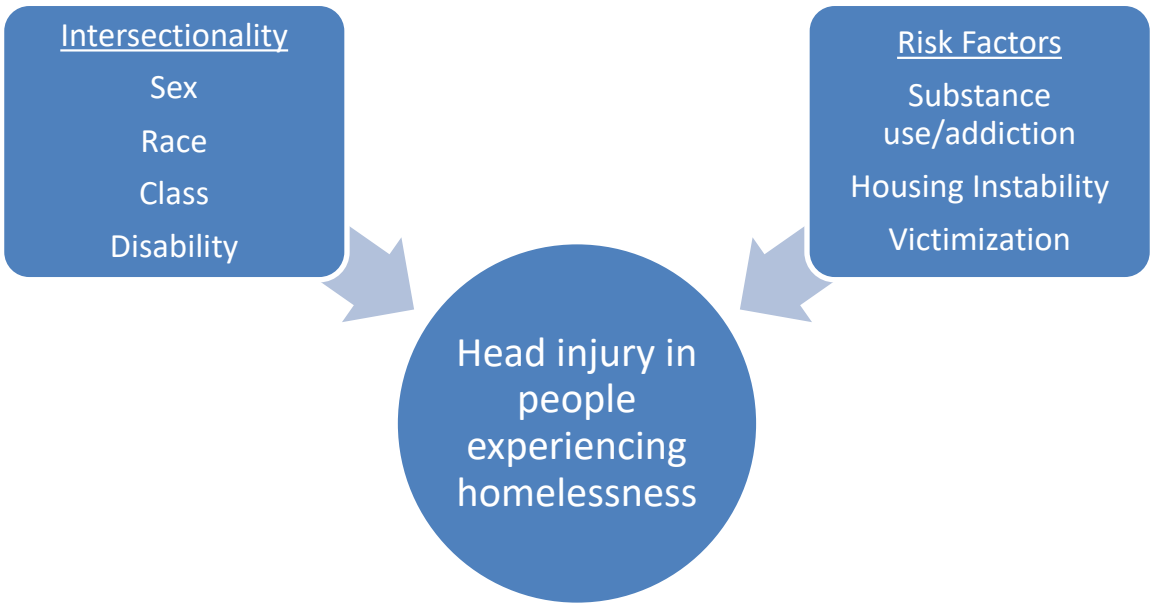
5.1 Intersectionality

Foundational articles on intersectionality were written by Kimberlé Crenshaw (Crenshaw, 1989; Crenshaw, 1991). Crenshaw (1989; 1991) posited that power and power imbalances shape one's identity and social hierarchies. These identities can include categories such as gender, class, sexuality, ability, age, and race which may be hierarchal within society (Bauer et al., 2021; Hill Collins, 2019; Lapalme et al., 2020). An awareness of intersectionality involves acknowledgement that structures of power intersect and impact one's individual experiences of oppression or privilege. Power imbalances occur in many societal structures in Canada including in health care, education and governments. This imbalance of power can subjugate people with lesser power through poor health, lack of education and poverty. Through research, we can explore the issues affecting an individual or population, such as head injury in people experiencing homelessness, and the complex relationship between structures of power and health inequalities (Crenshaw, 1989; Crenshaw, 1991; Cho, Crenshaw & McCall, 2013).

Tenets of the theory of Intersectionality include: 1) structures that can affect an individual's social or health status are all connected to one another, 2) relationships between these structures create complex social variations for the individual, 3) intersections between each of the structures contribute multiplicatively to the individual's perspective and experience of health inequality, lastly 4) intersectionality as a theory seeks to reveal how intersecting structures shape social and health inequities (Hankivsky & Chrisofferson, 2008, Heard et al., 2019; Hill Collins, 2019).

In the context of this study, Intersectionality theory was used to explore the concurrent impact of multiple social and socioeconomic forces facing people experiencing homelessness who have experienced a head injury (Bauer, 2014; Crenshaw, 1991; Cho, Crenshaw & McCall, 2013; Hankivsky & Chrisofferson, 2008). Gender, racialization, poverty and (dis)ability are oppressive forces that may be shaping this issue. In addition, substance use, housing instability and violence are each associated with head injury in people experiencing homelessness (Hwang et al., 2008; Mejia-Lancheros et al., 2020; Topolovec-Vranic at al., 2017) (Figure 1). By viewing head injury in people experiencing homelessness with an intersectional lens, we may better understand the complex relationships which are associated to this issue (Hankivsky & Chrisofferson, 2008).

Figure 1- Conceptual model depicting relationships between intersectional and known risk factors on head injury in people experiencing homelessness



6 Literature Review

6.1 Search Strategy

CINAHL, PubMed and Scopus databases were used to carry out the literature review. The review encompassed key variables used in this study. Keywords for variables

included “homeless,” “housing,” “head injury,” “brain injury” and “concussion.” The literature search was limited to peer-reviewed articles published in the English language. Articles which did not include head injury and people experiencing homelessness were excluded. The extracted literature was reviewed until repetition of findings occurred. Of the 300 results returned from the search strategies, a total of 36 primary sources were found and reviewed. Hand searches of the extracted literature was also used to find two additional relevant articles. This literature review reported on the present state of the literature on head injury and people experiencing homelessness.

6.2 Head Injury

There are two types of head injury; diffuse and focal (Teasdale, 1995). Diffuse includes head injury which includes the entire brain and head such as concussions, diffuse agonal and hypoxic damage. Focal includes head injury that only includes one part of the head or brain such as contusion, laceration or haemorrhage (epidural, subdural, intracerebral or subarachnoid) (Teasdale, 1995). In the general population motor vehicle accidents (MVA) were the most common cause of head injury in individuals under 60 years of age (Barnes et al., 2015; Guinn et al., 2018; Pritchard et al., 2019; Topolovec-Vranic et al., 2014). Falls were the most common cause of head injury in the general population over 60 years of age (Barnes et al., 2015; Topolovec-Vranic et al., 2014). In people experiencing homelessness, approximately 50% report a lifetime history of head injury, the most common cause being assault (Barnes et al., 2015; Gargaro et al., 2016; Hwang et al., 2008; Nikoo et al., 2017; Pritchard et al., 2019; Schmitt et al., 2017; Topolovec-Vranic et al., 2014). Other mechanisms of head injury in people experiencing homelessness include hypoxia secondary to strangulation (Adshead et al., 2019; Pritchard et al., 2019) and violent acts such as pub brawls or street fights (Pritchard et al., 2019). In multiple studies, people experiencing homelessness reported that their first head injury predated their first experience of homelessness (Barnes et al., 2015; Hwang et al., 2008; Schmitt et al., 2017; Oddy et al., 2012). Recurring themes in the literature related to head injury in people experiencing homelessness include impaired cognition, psychiatric diagnosis, housing stability, relationships with family and others, personal safety, health service use and substance use.

6.3 Income and Education

From the literature, it was found that for people experiencing homelessness with a concomitant head injury, their highest level of education ranged from less than high school education (Topolovec-Vranic at al., 2017) to some college education (Guinn et al., 2018). Occasionally participants were found to be employed, bringing home an income of less than 25,000 dollars annually (Guinn et al., 2018), but most were unemployed (Guinn et al., 2018). In Ontario, social assistance programs in place for people experiencing low income or vulnerable housing include welfare, which is called Ontario Works (OW) and Ontario Disability Support Program (ODSP). OW is available for individuals who are experiencing financial need to cover expenses related to daily living; food, clothing and housing. In order to receive Ontario Works, you often must also engage in employment-related activities. OW supplements approximately $733 dollars per month for a single person without children (Government of Ontario, 2022). ODSP is for individuals experiencing financial need as well as chronic disability or another prescribed class as determined by the Government of Ontario. ODSP supplements approximately $1169 dollars per month for a single person without children (Government of Ontario, 2022). For reference, the average rent in Ontario is $1119 (Canada Mortgage and Housing Corporation, 2022).

6.4 Impaired Cognition

Impaired cognition is associated with head injury in people experiencing homelessness (Andersen et al., 2014). In addition, verbal memory and neurocognitive performance can also be affected (Cusimano et al., 2021; Twamley et al., 2019). In people experiencing homelessness with history of head injury and alcohol dependence there may be an acceleration of cognitive aging (Gicas et al., 2020). People experiencing homelessness with head injury resulting in cognitive impairment may require long term supportive housing, although there is limited suitable housing and funding available (Cameron et al., 2001; Jackson, 1994; Levasseur et al., 2016; Wright et al., 2017). Design, location and surrounding neighbourhood must be considered when choosing suitable housing for people experiencing homelessness with head injury resulting in cognitive impairment (Wright et al., 2017). Attention must be paid to an individual’s housing needs prior to

placement to ensure they are housed appropriately (Cameron et al., 2001; Lavasseur et al., 2016).

6.5 Sex & Gender

Occurrence of head injury in people experiencing homelessness was similar between a sample of men and women (Schmitt et al., 2017). Gender represents socially constructed roles, responsibilities and identities (Canadian Institute of Health Research [CIHR], 2019; Clayton et al., 2016). Sex represents the biologic, anatomic or physiologic features of an individual (CIHR, 2019; Clayton et al., 2016). In head injury in people experiencing homelessness; gendered differences in head injury often include the mechanism of injury and sex differences often include the physical recovery process. Women are predominately, but not exclusively, the victims of domestic assault resulting in head injury (Linton, 2015; Pritchard et al., 2019). Females (sex characteristic) usually present with specific symptoms and have a longer physical recovery time compared to males (Hanafy et al., 2020). In individuals admitted to the emergency room (ER) with head injury and a positive toxicology screen, it was found that they were more likely to be male (Yue at al., 2020).

6.6 Psychiatric Diagnosis

Mental illness is found to be associated with head injury in the people experiencing homelessness (Hwang et al., 2008; Nikoo et al., 2017; Topolovec-Vranic et al., 2017). Specifically, head injury in men experiencing homelessness is more likely to be found in those who have a history of mental illness (Topolovec-Vranic et al., 2014). In addition, head injury is associated with overall poorer reported physical and mental health status (Hwang et al., 2008). A positive correlation was found in which individuals with a higher need for mental health services also experienced a higher number of violence inflicted head injury (Mejia-Lancheros et al., 2020). Mental illness was also a risk factor for head injury secondary to suicide attempt (Adshead et al., 2019). Head injury and experiencing homelessness are associated with outcomes such as difficulties with mental health or suicidal ideation as well as substance use and discrimination (Mackelprang et al., 2014; Noel et al., 2016). Schmitt et al. (2017) found there was no association between assault

related head injury and psychiatric diagnosis, rather mood disorders were more prevalent in participants with reported head injury. Nikoo et al. (2017) specifically found schizophrenia and mood disorders to be associated with head injury in people experiencing homelessness. Topolovec-Vranic et al. (2017) and Noel et al. (2016) found that psychosis disorder specifically was not associated with head injury in people experiencing homelessness. In addition, history of major depressive episode, post-traumatic stress disorder, panic disorder and mood disorders are related to head injury in people experiencing homelessness (Topolovec-Vranic et al., 2017).

6.7 Housing Stability

Housing instability, poverty, and social exclusion are associated with having a higher risk for violence and subsequent head injury (Mejia-Lancheros et al., 2020; Thompson et al., 2020; Topolovec-Vranic et al., 2017). Alternatively, intersections between head injury and socioeconomic factors such as housing, education, income, and employment was found to be significant as head injury increases the risk for socioeconomic disadvantage (Kavanagh et al., 2015). Living in a family environment and residential stability may be protective for head injury (Nikoo et al., 2017; Thompson et al., 2020). However, family environments may not always be protective as there is a risk for childhood or domestic abuse and trauma (Adshead et al., 2019; Ma et al., 2019; Pritchard et al., 2019).

Head injury has been reported to be an unfavourable but typical consequence due to physical violence in people experiencing homelessness environment (Heerde & Pallotta-Chiarolli, 2020). Youth experiencing homelessness have reported having to use physical violence on the streets to establish dominance and hierarchy (Heerde & Pallotta-Chiarolli, 2020). The learned behaviour is to fight back and, over time, become dissociated from the emotion and thoughts attached to violence (Heerde & Pallotta-Chiarolli, 2020. Head injury with loss of consciousness (LOC) is often more common in men experiencing homelessness (Topolovec-Vranic et al., 2017). From qualitative studies surrounding people experiencing homelessness and head injury, it was found that for males, violence is often a result of acting tough or establishing power hierarchies on the street or being assaulted while rough sleeping (Heerde & Pallotta-Chiarolli, 2020). In youth

experiencing homelessness, women are more at risk if they accept an offer to stay in a shelter (Heerde & Pallotta-Chiarolli, 2020).

6.8 Relationships with family and others

Living in a family setting was found to be protective for head injury compared to housing instability (Thompson et al., 2020). However, there may be concerns or inconsistencies related to this issue since there is also risk for domestic assault resulting in head injury (Linton, 2015; Pritchard et al., 2019). Mok et al. (2010) found that head injury in infants under the age of two was associated with parental unemployment, health, education level, crime and housing.

Women with head injury were more likely to report assault by a partner or date, while for men the exact mechanisms of assault were not specified (Schmitt et al., 2017). Perpetrators of violence may also have been victims of assault themselves, either previously in their lives such as childhood family violence or childhood abuse or in response to current abuse and trauma such as self-defence (Heerde & Pallotta-Chiarolli, 2020; Pritchard et al., 2019). Therefore, head injury is both a consequence and a predictor of family violence (Pritchard et al., 2019).

Violence and abuse in childhood could be the direct cause of head injury or can lead to poor attachment issues and inability to form relationships and may lead individuals into conditions where they are more vulnerable to head injury later in life, such as abusive relationships or sex work (Adshead et al., 2019; Ma et al., 2019). A study by Baumann et al. (2018) found that 100% of sex workers had reported at least one head injury directly related to their work (N=10).

6.9 Personal Safety

Song et al. (2018) found that of five hundred people experiencing homelessness, 64% had a previous head injury and 88% had experienced childhood abuse and trauma. Ma et al. (2019) also found that adverse childhood experiences were associated with a history of head injury.

People experiencing homelessness are treated more often for assault-related injuries compared to individuals who are housed (32% versus 9.5%), with similar findings for intentional self-harm (10.7 versus 2.7%), and penetrating injury (16.0 versus 6.5%) (Miller et al., 2020). Topolovec-Vranic et al. (2017) also found that head injury with LOC was associated with previous suicide attempts. Personal safety continues to be an issue for both men, women, and children, as abuse and assaults remain one of the leading mechanisms of injury in people experiencing homelessness (Barnes et al., 2015; Gargaro et al., 2016; Schmitt et al., 2017; To et al., 2015; Topolovec-Vranic et al., 2014).

6.10 Health Service Use

People experiencing homelessness with a history of head injury have been found to have high use of emergency department (ED) and justice services (To et al., 2015). People experiencing homelessness were more likely to have a head injury requiring hospitalization compared to the general population (McMillan et al., 2015; Rosendale et al., 2021; Topolovec-Vranic et al., 2017). Admission to hospital in people experiencing homelessness is often physical in nature, the most common diagnoses were: mental and behavioural disorders including substance use, overdose, self-harm, suicidal ideation and depression (28.3%), external causes of morbidity and mortality including MVA, trauma and assault (18.7%), or other consequences of external causes including head injury and poisoning (12.4%) (Field et al., 2019). This population is also at risk for having unmet healthcare needs (Topolovec-Vranic et al., 2017), and as well are at higher risk for hospital readmission within 30 days of discharge compared to the general population, particularly in the case of admission due to head injury (Rosendale et al., 2021).

Individuals with comorbid diagnosis of mental illness, substance use and a head injury may be at risk for poor treatment and poor management within the healthcare system, as they often become stuck between services or become transient due to lack of confidence with HCP to manage care (Gargaro et al., 2016). Healthcare providers may stigmatize or be unaware of the interplay between these diagnoses and therefore believe that symptoms of head injury may be an exacerbation of substance use or mental illness rather than severe head injury (Gargaro et al., 2016).

Stigma and discrimination within systems of healthcare may also lead individuals to avoid healthcare treatment (Baumann et al., 2018) or leave against medical advice (Miller et al., 2020). They often attempt to manage and treat their own injuries or are dishonest about how the injuries were sustained for fear of further stigma or discrimination from healthcare professionals (Heerde & Pallotta-Chiarolli, 2020). In a study by Synovec and Berry (2020), providers were trained to better screen for head injury in a healthcare agency that works with people experiencing homelessness. Once providers were trained to screen properly, it was found that 84% of their population had a history of head injury but only 12% had it originally listed in their health problem list. Therefore, head injury may be vastly underrecognized in this population and could lead to mismanagement of symptoms (Synovec & Berry, 2020).

6.11 Substance Use

In the literature, substance use was found to be associated with head injury in people experiencing homelessness (Gargaro et al., 2016; Hwang et al., 2008; Mackleprang et al., 2014; Mejia-Lancheros et al., 2020; Miller et al., 2020; Topolovec-Vranic et al., 2017; Schmitt et al.,2017). The incidence of head injury during one longitudinal study was associated with lifetime occurrence of head injury, mental health diagnosis and alcohol and drug use (Nikoo et al., 2017). Svodoba and Ramsay (2015) found that intoxication and head injury were the main causes why homeless or precariously housed men appear in the ER unconscious. Alternatively, Yue et al. (2020) studied individuals who presented to the ED with a head injury and found that only 27% of the participants had used substances prior to arrival to ED with head injury.

Substance use can be due to stress from adverse life events such as abuse or trauma (Pritchard et al., 2019). Substance use in the household during childhood was found to be associated with head injury in adulthood (Guinn et al., 2018) (Topolovec-Vranic et al., 2014). In addition, the risks for head injury and violence can be increased while the perpetrator or victim is under the influence of substances (Pritchard et al., 2019). Substance use may also increase occurrence of head injury indirectly through an increase of risk-taking behaviours, such as sex work or driving while intoxicated, which may lead to head injury.

7 Purpose Statement

Lifetime occurrence of head injury is disproportionately affecting people experiencing homelessness in Canada. Experiencing homelessness is a predictor and an outcome of head injury (Barnes et al., 2015; Hwang et al., 2008; Schmitt et al., 2017). The mechanism of head injury in this population is most often assault (Barnes et al., 2015; Gargaro et al., 2016; Topolovec-Vranic et al., 2014) and is not typically an isolated incident (Nikoo et al., 2017). Risk factors for head injury in people experiencing homelessness include history of abuse and trauma, housing instability and substance use. However, intersections between risks for head injury and overlapping factors including gender, race, class and ability can create complex dynamics leading to social and health inequities (Marmot, 2008; McCall, 2005; Mikkonen & Raphael, 2010).

Through secondary exploration of data from the No Fixed Address Version 2 (NFAv2) (Forchuk et al., 2021) and No Fixed Address Version 2x (NFAv2x) (Forchuk et al., 2020) studies, the purpose of this study is to explore relationships between personal identities and risks related to head injury in people experiencing homelessness with particular regard to specific intersections of social and physical societal structures.

8 Research Questions

Using structures of individual identity (gender, race, class [education and income] and disability [physical or mental]) as well as known risk factors for head injury in people experiencing homelessness (history of victimization, housing instability, substance use), the following research questions were addressed:

1. What associations exist among housing instability, victimization, and substance use, in relation to head injury in people experiencing homelessness?
2. What associations exist among sex, ethnicity, education, income, physical and mental health issues, in relation to head injury in people experiencing homelessness?

9 Hypotheses

H1: Gender, race, education, income, physical and mental health issues are associated with head injury in people experiencing homelessness.

H2: Housing instability, victimization and substance use are associated with head injury in people experiencing homelessness.

10 Methodology

10.1 Study Design

The current study applied a quantitative, exploratory correlational design in which cross-sectional secondary data are used. The primary studies generated the data using a longitudinal, mixed methods program evaluation design. The purpose of NFAv2 and NFAv2x, the primary studies, was to examine housing outcomes from a homeless prevention intervention in acute medicine (NFAv2x) and psychiatric hospital wards (NFAv2) (Forchuk et al., 2020 & 2021). The programs required collaborations with Ontario Works, Canadian Mental Health Association (CMHA) and the Salvation Army Centre of Hope in order to implement and fund the interventions. The aims of the intervention studies were to identify individuals at risk for being discharged to no fixed address, connect them with housing using the collaborative services and follow study participants longitudinally to gather quantitative data on housing outcomes. Qualitative data were also obtained to explore participant experiences with the intervention.

10.2 Setting

The NFAv2 and NFAv2x studies were both completed in an urban city in Ontario, Canada. The studies took place within two acute care hospitals as well as one psychiatric hospital and one health centre institute within the city. In addition, follow up data were collected in the community at agreed upon locations arranged between the participant and the interviewer. Locations included in-home visits with participants, coffee shops or other public locations.

10.3 Sampling

Social workers and other discharge facilitators assisted to recruit participants who were at risk for or experiencing homelessness from the inpatient medical and psychiatric wards through referrals to the intervention team (Forchuk et al., 2020 & 2021). For the NFAv2 study, a total of 107 adult participants were recruited from psychiatric units at SJHC and LHSC and were included in the study sample. Inclusion criteria for this study included participants over the age of 18, who were experiencing homelessness or at risk of homelessness and an inpatient on the psychiatric units at LHSC or SJHC.

In the NFAv2x study, there were 76 adult participants who accessed the intervention, of these, 24 participants consented to participate and were included in the study sample. Inclusion criteria for this study included participants over the age of 18, who were experiencing homelessness or at risk of homelessness and an inpatient on the medical units at LHSC.

With 107 from NFAv2 and 24 from NFAv2x, this study potentially had a total of 131 subjects. However, four of the participants were unable to complete baseline data collection and one participant did not know if they had sustained a head injury in their lifetime and was unable to answer the question, two participants declined to answer any questions regarding income and three participants did not feel comfortable to answer questions regarding victimization and thus were eliminated from the study leaving a total sample size of 121.

Power analysis was completed to determine the statistical strength of the study. It was estimated using G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007) that with a sample size of 121, and alpha = 0.05, we will need an odds ratio (OR) of 1.8 to achieve a power = 0.80.

10.4 Inclusion Criteria

Inclusion criteria for NFAv2x study included:

1. Participants over the age of 18
2. Experiencing homelessness or at risk for homelessness

3. Medical unit inpatient

Inclusion Criteria for the NFAv2 study included:

1. Participants over the age of 18
2. Experiencing homelessness or at risk for homelessness
3. Psychiatric unit inpatient

10.5 Operational Definitions

10.5.1 Self-Reported Head Injury

The dependent variable for this study was self-reported lifetime history of head injury. Head injury encompasses a broad range of injuries, all relating to a blow or injury sustained to the head including brain and scalp (Teasdale, 1995). An exact description or timeline was not provided to participants during data collection; therefore, our particular variable encompasses lifetime incidence of diffuse and focal head injuries with or without loss of consciousness. The data were self-reported as participants answered the question "have you ever had a head injury?" on the demographic and migration questionnaire independently and the response was dichotomous; yes or no (Forchuk et al., 2020).

10.5.2 Gender

The relationship between gender and head injury in people experiencing homelessness were observed in this study to examine if inequities exist. The data for this variable came from the demographic and migration questionnaire. Participants self-identified their sex and gender as male, female, transgender or prefer not to disclose in two places in the questionnaire and responses were consistent across both variables (Forchuk et al., 2021). Gender was the characteristic used for this study as it was identified by the individual rather than biologically. As only the male and female options were reported, the transgender and prefer not to disclose options were not included and the variable was treated as dichotomous. Since gender was chosen as the self-identified characteristic and

female and male are biologic, or sex, components, man and woman will be used for the remainder of this study (Clayton et al., 2016).

10.5.3 Ethnic/racial group

From the literature on head injury in people experiencing homelessness, Indigenous (Linton, 2015; Topolovec-Vranic at al., 2017) and Caucasian (Guinn et al., 2018; Hwang et al., 2008; Mejia-Lancheros et al., 2020) were the most commonly represented ethnic/racial groups. In our study, participants self-reported their race/ethnicity. Potential responses included European origin (Caucasian), Indigenous, visible minority or other. Visible minorities, in Canada, refer to "persons, other than Indigenous peoples, who are non-Caucasian in race or non-white in colour" (Statistics Canada, 2021). Due to low reported levels for Indigenous, visible minorities and other, this was collapsed into a category called "Indigenous/other." Therefore, there are two categories for race; European origin (Caucasian) or Indigenous /other.

10.5.4 Social Class

Social class is a hierarchal societal structure based on social and economic standing within society. Low social and economic standing, particularly in urban centres, are associated with having a higher risk for violence and subsequent head injury (Mejia-Lancheros et al., 2020; Muggah, 2012). In this study, class was measured by highest level of education and income. Since homelessness was one of the inclusion criteria for this study, history of homelessness was not included in measuring social class.

For the variable "highest level of education," there were three highest achieved levels that participants were to choose from; grade school, high school, or community college/university. Income was valued in Canadian dollars and ranged from $0 to $3000 per month. In Canada, low income is relative to the median of household incomes in the country. If a household income is less than 50% of the median household income, they are considered low income (Statistics Canada, 2021). For this study, many income sources were OW and ODSP which have a monthly income of less than $1169.

Therefore, for this study, income was separated into two variables; those with a monthly income less than $1169 and those with an income above $1170 per month.

10.5.5 Disability

Head injury is associated with overall poorer reported physical and mental health status (Hwang et al., 2008). For this study, disability was measured using two self-reported variables from the Demographic and Migration Questionnaire; “have you had any physical health issues in the past year” or “have you had any mental health issues in the past year” (Forchuk et al., 2020). The responses were not combined as there may be differences in relationships with head injury depending on if participants have mental health or physical health issue. Self-reported physical and mental health issues within the last year each had the dichotomous response of yes, they have had an issue in the past year or no, they have not had an issue in the past year.

10.5.6 Substance Use and addiction

Substance use and addiction was found to be associated with head injury in people experiencing homelessness (Gargaro et al., 2016; Hwang et al., 2008; Mejia-Lancheros et al., 2020; Miller at al., 2020; Topolovec-Vranic at al., 2017; Schmitt et al., 2017). For this study self-reported substance use or addiction was measured using the variable “do you currently have any substance/addiction issues?” from the Demographic and Migration questionnaire (Forchuk et al., 2020). The response was a dichotomous yes or no.

10.5.7 Housing Stability

Residential instability is associated with increased odds for head injury in people experiencing homelessness (Nikoo et al., 2017). For this study the variable being measured is “number of undesirable moves in the past five years.” This variable was recoded into a categorical variable from a continuous variable in order to decrease the number of levels, as all levels four and above had less than ten subjects per item. Recoded variable had five responses; zero, one, two, three and four or more.

10.5.8 Victimization

Victimization causing head injury in people experiencing homelessness can be related to assault, intimate partner violence, and self-inflicted violence (Mejia-Lancheros et al., 2020). Assault is the leading cause of head injury in people experiencing homelessness (Barnes et al., 2015; Gargaro et al., 2016; Schmitt et al., 2017; To et al., 2015; Topolovec-Vranic et al., 2014). Directly, violence and victimization in people experiencing homelessness can be due to establishing power and hierarchy on the street, rough sleeping or accepting a place to stay for the night and being assaulted. For some, family violence or intimate partner violence is a risk factor for head injury secondary to physical assault (Adshead et al., 2019; Pritchard et al., 2019). For this study, we used the variable “in the past year, have you been the victim of any violent crimes such as assault, rape, mugging or robbery?” from Lehman’s quality of life questionnaire, the response was a dichotomous yes or no.

10.6 Measures and Covariates

The dependent variable was occurrence of self-reported head injury. The independent variables included; gender, race, education and income (i.e., social class), physical and mental health issues (i.e., disability), history of abuse and trauma (i.e., victimization), housing instability and substance use. Data Collection tools including; Demographic and Migration (Forchuk et al., 2020), Housing History Survey (Forchuk et al., 2020) and the Lehman Quality of Life Scale (Lehman, 1988; Lehman et al., 1993) were used to gather data on the variables of interest in this study.

The Demographic and Migration Form (Appendix A), a 26-item questionnaire, was used to collect data with regards to a participant’s socio-demographic variables (Forchuk et al., 2020). The questionnaire was developed by the NFAv2 and NFAv2x research teams specifically for these studies. Data for the dependent variable of self-reported head injury is obtained from this Form.

The Housing History Form (Appendix B) was used to collect data on participant’s last five years of housing including type of residence, length of time spent residing and

satisfaction with the living situation. The final question on the form is “How many undesirable moves have you had in the last five years?,” this question was used to represent the independent variable “housing stability.”

Lehman Quality of Life Scale (Appendix C) measured quality of life both objectively (what do you do) and subjectively (how do you feel about what you do) in participants with mental illness. There are ten sections labelled A to J which measure items such as living situation, activities of daily living, family and social relationships, finances, work and school, legal and safety issues, health, and general life satisfaction. The Lehman Quality of life scale is considered to be a reliable and valid self-report tool to measure Quality of Life (Lehman, 1988; Lehman et al., 1993). Using this tool, we gathered data on victimization as well as income.

10.7 Data Collection Procedures

Primary data were collected from intervention participants, community supports and healthcare providers between the years 2017 to 2021 (Forchuk et al., 2020). For quantitative data, Demographic and Migration questions, Lehman Quality of Life, Housing History Survey, Consumer Housing Preference Survey, Utilization of Hospital and Community Services and SPDAT instruments were self-completed by intervention participants with guidance provided by trained research coordinators and assistants as part of the NFAv2 and NFAv2x research studies. Qualitative data were obtained using focus groups with intervention participants, community supports and healthcare providers to explore intervention experiences. Prior to data collection, a letter of information and informed consent was reviewed and obtained. Participants received a $20 honorarium for participating in the research study. Prior to study use, the instruments were checked by research coordinators for errors, formatting, and consistency. Once completed by participants the data were then entered into REDCap and validated by research assistants to ensure completeness and accuracy.

10.8 Data Analysis

The Statistical Package for Social Sciences (SPSS) version 27 (IBM Corp., Armonk, NY) was used to analyse data. Binary logistic regression was performed to identify variables associated with head injury in people experiencing homelessness in accordance with the study hypotheses.

A priori statistical significance (α) was set at .05. Data were examined for the presence of outliers and missing data. Preliminary analyses included performing: 1) descriptive and frequency analyses for each variable; 2) demographic statistics to analyze the sample characteristics; 3) Bivariate analyses to explore relationships between independent and the dependent variable (Table 1); and 4) Binary logistic regression modeling to determine possible associations between the independent variables and the dichotomous dependent variable (occurrence of self-reported head injury).

For the binary logistic regression, variables were tested in blocks; intersectional variables of gender, race, class and disability in one block and known risk factors in the other to align with each of the two research questions. Variables which have categories with low case counts were collapsed into fewer to ensure at least 15 cases per category (Laerd Statistics, 2017). Missing data were managed using listwise deletion (Polit & Beck, 2012).

11 Findings and Interpretation

11.1 Demographic Data

There were 121 total participants from NFAv2 and NFAv2x who participated in the study at baseline data collection where this study acquired its cross-sectional data. From this sample 58.7% identified as male/man and 41.3% identified as female/woman. Ages ranged from 18-81, with a mean of 39.57, median of 38 and mode of 26 (Appendix D). Race/ethnicity comprised of 74.4% Caucasian, 12.6% Indigenous, and 12.9% visible minority/other. Income sources mainly included OW (22.3%), ODSP (57.9%), Canada Pension Plan (CPP) (11.6%) and other (14.2%). The rate of employment was 3.3%. Single/never married was the most common marital status (65.3%). Of the participants,

81.8% reported they are currently in contact with someone in their family. Just under half of the participants reported having children (47.1%), of this, 6.3% had full custody. Highest level of education included grade school (28.1%), high school (38.8%), or college/ university (33.1%).

The percentage of the sample who reported experiencing homelessness in their lifetime was 81%, the mean age for experiencing homelessness was 30. On average, participants reported experiencing homelessness three times. Just over half of the participants (50.8%) reported a lifetime occurrence of head injury. The mean age of first head injury was 15.2 and the mean number of self-reported head injuries was 7.4. This finding aligns with the literature that most participants had a head injury prior to their first episode of homelessness (Cusimano et al., 2021; Hwang et al., 2008; Topolovec-Vranic et al., 2014).

The percentage of participants who had a previous psychiatric hospitalization was 83.5%, common psychiatric diagnoses included mood disorders (52.8%), anxiety disorder (35.5%), post-traumatic stress disorder (23.1%) and schizophrenia (18.2%). Chronic physical illnesses were reported in 62% of participants, most commonly; arthritis (10.7%), hepatitis/liver diseases (10.7%), high blood pressure (9.1%), respiratory illness (8.3%) and other (38.8%). Other chronic illnesses commonly reported was back pain, hypothyroid, gastrointestinal issues, and eating disorders. Current substance use or addiction were reported in 67.5% of participants including; tobacco (48.8%), caffeine (27.3%), alcohol (16.5%), marijuana (17.4%), and prescription drugs (14.3%), other street drugs were less common (0.8%-11.9%).

11.2 Variables of Interest

Frequencies of variables of interest were examined to ensure adequate cell size independently (Appendix E & F) as well as in relation to the dependent variable (Appendix G). Gender, mental as well as physical health problems, and current substance use or addiction were all dichotomous originally and had adequate cell sizes, therefore no alteration of the variables was required

The variable race originally had four categories: European Origins (Caucasian), Indigenous, visible minority or other, due to the small cell sizes of Indigenous, visible minority and other they were collapsed into one variable called other.

The variable of housing stability, “how many undesirable moves have you had in the past five years” was originally a continuous variable. Responses above four moves in the past five years had low cell counts, but ranged from zero to 57 moves. This variable was collapsed into a categorical variable with five responses; zero, one, two, three, or four or more moves in the past five years.

Income was also a continuous variable originally, it was collapsed into two variables to represent income below $1169 Canadian Dollars per month which is the amount most people were receiving if they were enrolled in ODSP, this category would also represent those receiving OW or those who have no income. Income levels $1170 and above would represent those who are collecting pensions from previous employment or are currently employed, this category may also include people who are receiving supplemental income and on ODSP or OW such as Ontario Trillium Benefit, Good and Service Tax (GST), Workplace Safety and Insurance Board (WSIB) or Child Tax Benefits. Highest level of education was left as a variable with three responses; grade school, high school or college/university. Two participants declined to answer this question and were therefore not included in the logistic regression.

The variable victimization had three participants who declined to answer the question and were therefore not included in the logistic regression. There were 121 participants remaining who were included in the logistic regression analysis.

11.3 Bivariate Analysis

Bivariate analyses were conducted to examine the relationships between the dependent variable (self-reported head injury) and independent variables (gender, race, education and income, substance use, victimization, housing stability, and physical and mental health problems) (Appendix G). Using Pearson Chi Square analyses, significant relationships were found between; 1) physical health problems in the past year and the

self-reported head injury; 2) mental health problems in the past year and self-reported head injury; and 3) victimization such as assault in the past year and self-reported head injury (Table 1). Therefore, Hypothesis one (H1) and Hypothesis two (H2) were partially supported as four of the independent variables have a bivariate relationship with the dependent variable. The independent variables gender, race, education, income, substance use or housing instability were not associated with head injury.

The theory of Intersectionality posits that structures that shape an individual's experience of oppression or privilege also intersect to shape social and health inequities. Therefore, bivariate analyses were performed using Kendall's tau b statistical testing to determine if any of the variables were significantly associated. From this analysis, physical health issues and gender, physical health issues and income, and violence and substance use were also related to each other (Appendix H). In addition, education and income were significantly related which were being examined together to measure class.

Table 1- Relationships between Independent Variables and Self-Reported Head Injury

Variable	No Occurrence of Head injury	occurrence of head injury	Totals	Pearson Chi-Square	p-value
Income					
$0-1169	47.8% (43)	52.2% (47)	72.6 % (90)	0.263 (1df)	0.608
$1170-3000	52.9% (18)	47.1% (16)	27.4% (34)		
Education					
Grade school	38.2% (13)	61.8% (21)	27% (34)	2.962 (2df)	0.227
Highschool	48.9% (23)	51.1% (24)	37.3% (47)		
Community College	57.8% (26)	42% (19)	35.7% (45)		
In the last year, have you had any physical health problems?					
Yes	40.5% (32)	59.5% (47)	62.7% (79)	6.414 (1df)	**0.011**
No	63.8% (30)	36.2% (17)	37.3% (47)		
In the last year, have you had any mental health issues?					

Yes No	44.6% (45) 68% (17)	55.4% (56) 32% (8)	80.2% (101) 19.8% (25)	4.407 (1df)	**0.036**
Gender Man Woman	 43.8% (32) 56.6% (30)	 56.2% (41) 43.4% (23)	 57.9% (73) 42.1% (53)	 2.003 (1df)	 0.157
Race/Ethnicity European origins Indigenous/ Other	 54.3% (51) 34.4% (11)	 45.7% (43) 65.6% (21)	 74.6% (94) 24.4% (32)	 3.775 (1df)	 0.052
Current Substance Use/ Addiction Yes No	 49.4% (42) 48.8% (20)	 50.6% (43) 51.2% (21)	 67.5% (85) 32.5% (41)	 0.004 (1df)	 0.947
Undesirable moves in past 5 years 0 1 2 3 4+	 47.4% (9) 51.9% (14) 65.4% (17) 47.6% (10) 36.4% (12)	 52.6% (10) 48.1% (13) 34.6% (9) 52.4% (11) 63.6% (21)	 15.1% (19) 21.4% (27) 20.6% (26) 16.7% (21) 26.2% (33)	 5.023 (4df)	 0.285
Victim of violent crime in the past year Yes No	 22.7 (10) 63.3% (50)	 77.3% (34) 36.7% (29)	 34.9% (44) 32.7% (79)	 18.980 (2df)	 **<.001**

11.4 Binomial Logistic Regression

Assumptions were met for a logistic regression including: 1) one dependent variable that is dichotomous; 2) one or more independent variables what are continuous or nominal; 3) there is independence of observations, dependent and independent variables are mutually exclusive and exhaustive; 4) minimum of 15 cases per independent variable; and 5) no significant outliers (Laerd Statistics, 2017). From examination of frequency and bivariate analysis, our data set met the assumptions for this statistical test. There were three cases with a residual value of greater than 2.5, determining that they may be outliers. After review, it was determined that they were kept in the analysis; first was -2.60, second was 3.91 and third was 6.43 standard deviations (Appendix I).

From the initial analyses, it was determined that there were significant relationships between head injury in people experiencing homelessness and experiencing victimization in the past year as well as having a mental or a physical health issue in the past year. There were no significant relationships between gender, race, class (education and income), substance use or housing stability and head injury. However, based on the literature and informed by the theory of intersectionality, each of the independent variables were retained in the logistic regression model. Although this approach reduced power of the study and increased the chance of a type two error, it was important for research to include intersectional as well as risk factor variables as determined through the literature review. In conclusion, the independent variables used in model building were: gender, race, class (education and income), mental and physical health issues in the past year, housing instability (number of undesirable moves in the past five years), current substance use or addiction, and victimization in the past year.

A multiple logistic regression analysis was performed to determine the relationship between gender, race, class, disability, substance use, housing instability and violence and head injury in people experiencing homelessness. The logistic regression model was run in two blocks in order to address both of the research questions. The first block included known risk factors for head injury including substance use, housing instability and victimization (Table 2). The second block included the risk factors from block one as well as intersectional identities including gender, race, class (education and income) and disability (mental and physical) (Table 3).

Block one was statistically significant $\chi 2(6df) = 23.89$, $p < .001$. The model accounted for approximately 18% (Cox & Snell R2) to 24% (Nagelkerke R2) of variance in head injury in people experiencing homelessness and was correctly classified in 69.4% of cases (Appendix I). Hosmer and Lemeshow test was not significant at 0.49, therefore the model was a good fit for the data. The variable that added most significantly to the model in block one was victimization (p=<.001, Wald chi-square=16.84) (Table 2). In addition, people experiencing homelessness had 7.11 times higher odds of having a head injury if they had been a victim of a violent crime such as assault, mugging, rape or burglary in

the past year (OR 7.11, 95% CI= 2.79, 18.15). The variables, substance use/addiction and housing instability were not significant in this model (Table 2).

Block two was also statistically significant $\chi 2(7df) = 31.17$, $p < .001$. The model was improved from block one as it now accounted for approximately 37% (Cox & Snell R2) to 49% (Nagelkerke R2) of variance in head injury in people experiencing homelessness and was correctly classified in 79.3% of cases (Appendix I). Hosmer and Lemeshow test was not significant at 0.22, therefore the model was a good fit for the data. Independent variables which were significant in this model included; victimization (p=<.001, Wald chi-square=17.95), highest level of education grade school (p=0.039, Wald chi-square=6.48) and college university (p=0.021, Wald chi-square=6.29), mental (p=0.004, Wald chi-square=8.46) and physical health issues (p=0.002, Wald chi-square=10.02) (Table 3). Variables which were not significant to the model included; housing instability, substance use, gender, race, high school education, or income. The adjusted odds ratios from "Exp(B)" column shows that; head injury was 13 times more likely in those who had been a victim of violence in the past year (OR 13.07, 95% CI= 3.98, 42.96), 82% less likely if they completed college/university (OR 0.180, 95% CI= 0.047, 0.688); head injury was 7.6 times more likely in those who report mental health problems in the past year (OR 7.64, 95% CI=1.94, 30.08); and head injury was 5.7 times more likely in those who reported a physical health problem in the past year (OR 5.66, 95% CI 1.94, 16.53). Variables which were not significant to the model included housing instability, substance use, gender, race, or income (Table 3).

Table 2- Variables in Block 1

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Substance/ addiction issues- Yes	-.422	.453	.865	1	.352	.656	.270	1.595
	Victimization- Yes	1.962	.478	16.840	1	.000	7.112	2.787	18.152

	Zero moves in the last 5 years			3.497	4	.478			
	One move in the last 5 years	-.482	.665	.526	1	.468	.617	.168	2.273
	Two moves in the last 5 years	-1.102	.707	2.427	1	.119	.332	.083	1.329
	Three moves in the last 5 years	-.167	.690	.059	1	.809	.846	.219	3.272
	Four or more moves in the last 5 years	-.131	.674	.038	1	.846	.877	.234	3.289
	Constant	.055	.607	.008	1	.927	1.057		

a. Variable(s) entered on step 1: Do you currently have any substance/addiction issues?, Have you been a victim of a violent crime in the past year?, How many undesirable moves have you had in the last 5 years?.

Table 3- Variables in Block 2

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Gender- Woman	-.996	.532	3.507	1	.061	.369	.130	1.048
	Highest Level of Education-Grade School			6.477	2	.039			
	Highest Level of Education- High School	-.660	.608	1.178	1	.278	.517	.157	1.702
	Highest Level of Education-College/University	-1.713	.683	6.294	1	.012	.180	.047	.688
	Ethnic/racial/ cultural group-Indigenous/other	.797	.556	2.051	1	.152	2.218	.745	6.602

Mental health problems- Yes	2.034	.699	8.464	1	.004	7.644	1.942	30.087
Physical health problems- Yes	1.733	.547	10.021	1	.002	5.656	1.935	16.534
Monthly income- $1170-3000	-.483	.541	.798	1	.372	.617	.214	1.781
Substance/addiction issues- Yes	-1.115	.581	3.680	1	.055	.328	.105	1.024
Victimization- Yes	2.571	.607	17.953	1	<.001	13.078	3.982	42.956
Zero moves in the last 5 years			4.533	4	.339			
One move in the last 5 years	-.578	.811	.507	1	.477	.561	.114	2.753
Two moves in the last 5 years	-1.493	.842	3.140	1	.076	.225	.043	1.171
Three moves in the last 5 years	-.083	.812	.011	1	.918	.920	.187	4.516
Four or more moves in the last 5 years	-.320	.814	.155	1	.694	.726	.147	3.579
Constant	-1.140	1.046	1.189	1	.276	.320		

Variable(s) entered on step 1: Do you currently have any substance/addiction issues?, Any violent crimes such as assault, rape, mugging, or robbery?, How many undesirable moves have you had in the last 5 years?.

12 Discussion

People experiencing homelessness have an increase in the occurrence of head injury compared to the general population (Ang & Wasserman, 2021; McMillan et al., 2015; Song et al., 2018). Understanding head injury in people experiencing homelessness requires more evidence to determine the scale of the problem and to better understand the intersections of oppressive identities and the layers of disadvantage that potentiate health inequity in this population. The theory of intersectionality suggests that social identities such as experiencing homelessness, may intersect with other identities such as gender, race, class and/or disability and create axes of oppression. At this axis is where

individuals may experience the multiplicative effect of oppression creating the conditions for health inequities such as head injury (Heard et al., 2019).

From this study, head injuries in people experiencing homelessness were significantly related to education, victimization as well as both mental and physical disability. Therefore, the research questions; 1) there will be a relationship between gender, race, class and disability, and head injury in people experiencing homelessness; and 2) there will be a relationship between housing instability, substance use, and victimization, are each partially supported by evidence from this study.

Low socioeconomic class is a known oppressive force, called classism, contributing to social and health inequities in Canada (Heard et al., 2019; Mikkonen & Raphael, 2010). It is a social hierarchy which has been created through power and social structures and is often measured by income and education (Luchenski et al., 2018; Mohd Saleem, 2020). In this study, all of the participants were experiencing housing instability and 96.7% were unemployed which created a context where many of the participants were already in a lower socioeconomic class. Many of the participants were receiving income from ODSP (57.9%) or OW (22.3%) which is less than $1169 dollars per month. This lack of variability may be why there was no significant relationship found between head injury and income. There was however, variability found within the variable highest level of education as well as a significant relationship between highest level of education and head injury.

There was a significant relationship found that participants with grade school as their highest level of education had greater odds of experiencing head injury (p=.039) compared to participants who had their highest level of education in high school or college/university. In addition, higher level of education was significant and found to be protective of head injury with participants 82% less likely to have experienced a head injury if they attended college/university (p=.012) (Appendix I). This does not imply that higher education directly prevents individuals from obtaining a head injury as there may be mediating or moderating variables which were not included in this study. For example, Stormacq et al. (2019) found through an integrated review of the literature that health

literacy was a variable that mediated the relationship between higher education and health outcomes such as occurrence of head injury.

For this study we do not have the temporal data to demonstrate age or education level in relation to lifetime head injuries. In our study sample, the mean age of the population was 40 and the mean age of first head injury was 15. At 15, participants would still be in high school, therefore, if they were unable to continue in school at the time of their head injury their highest level of education would be grade school. If participants were unable to continue attending school in grade school, they may not return to school in order to attain a high school, college or university diploma which through social hierarchies put them at risk for head injury as they were in a lower socioeconomic class.

From our background analyses we also found that income and education are significantly associated (Appendix H). Although this was not one of our research questions it does help to better understand the relationship between class and head injury. Even though income alone was not found to be significant in the logistic regression model, education was significant to the model and education and income are related to each other which may explain the mixed findings. For this study we had hypothesized that class, including education and income, would be related to head injury in people experiencing homelessness. The findings support this hypothesis, the intersections of lower socioeconomic class and experiencing homelessness together are associated with health inequities that are related to individuals experiencing head injury.

Head injuries are associated with poorer physical and mental health status (Mejia-Lancheros et al., 2020). From an intersectionality perspective, oppression associated with people experiencing physical and mental disabilities is called ableism (Heard et al., 2019; Mikkonen & Raphael, 2010). Individuals living with mental and physical disabilities may experience oppression though health inequity therefore preventing them from attaining their highest level of health. Disability as described in our operational definitions included both mental and physical disabilities, both of which were both significantly associated to head injury in people experiencing homelessness in the logistic regression

model. Therefore, our hypothesis was supported; disability was related to head injury in people experiencing homelessness.

From our sample, many participants had reported a history of mental health problems in the past year (80.2%) (Appendix G). This is consistent with the demographics and sampling as there were 107 participants who were recruited from a psychiatric unit. Having a mental health issue in the past year was significantly related to head injury in people experiencing homelessness (p=.004). From this study we could not determine causality, or temporality of the relationship; whether mental health led to an increase of head injury or if head injury led to mental health issues. But we can determine that people who did experience mental health issues in the past year were 7.6 times more likely to report a lifetime occurrence of head injury (Appendix I). Therefore, individuals who experienced a head injury in their lifetime are still experiencing issues with their mental health in the present.

Sixty-two percent of the population sample reported having a history of physical health issues in the past year, of this 61% reported having a lifetime occurrence of head injury (Appendix G). These physical health issues were self-reported therefore ranged from mild to severe physical health issues, both acute and chronic. From the background analysis (Appendix H), having a physical health issue in the past year was also significantly associated with income. The relationship of these two variables was explained by the way income was categorized for this study, either above or below $1169 dollars per month which is the amount people living on ODSP receive (Government of Ontario, 2022). Similar to the 61% of participants who reported having a physical health issue, 73% of participants had income equal to or below $1169 per month. (Appendix E). Participants who reported having a physical health issue in the past year were 5.7 times more likely to report a head injury in their lifetime. Therefore, like mental health issues, individuals who experienced a head injury in their lifetime continue to have physical health issues in the present.

The significant relationship between mental and physical health issues in the past year and head injury in people experiencing homelessness supports that ableism, or oppression

of people living with disability, continues in Canada. People who are living with head injury have continuing mental and physical health issues. Many people living with head injury are unable to work due to disability (Ontario Brain Injury Association, 2012) and are therefore also living in poverty, further potentiating their oppression. There must be long-term supports and follow-up in place for these populations to monitor and treat ongoing health issues.

Being a victim of a violent crime such as assault, rape, mugging or robbery in the past year was the final variable that was significantly related to head injury in people experiencing homelessness (<.001). This victimization can affect people on many levels; emotional, physical, financial, social and psychological (Canadian Resource Centre for Victims of Crime, 2005). Assault is the number one cause of head injury in people experiencing homelessness (Gargaro et al., 2016). This is unlike the general population as head injury in the general population is often caused by falls or MVA. Victimization was the only significant variable from block one which included; housing instability, substance use, and victimization. From our correlational data, victimization is significantly related to substance use and well as housing instability (Appendix H). The relationships between victimization and housing instability and victimization and substance use, although not the purpose for our current study, are valuable to understanding the relationships between victimization and head injury in people experiencing homelessness.

Victimization and head injury has been found across many groups; women are often victim of domestic abuse (Schmitt et al., 2017), up to 100% of sex workers have had a head injury (Baumann et al., 2018); adverse childhood experiences such as physical or emotional abuse is associated with head injury (Song et al., 2018), and people experiencing homelessness often treated in emergency rooms for assault related injuries (Miller et al., 2020). In our study, we were unable to determine causation but victimization was the strongest predictor of head injury in this population of homeless adults (p=>0.001, Wald chi-square=17.95). We can also determine that people experiencing homelessness who have been a victim of violent crime in the past year have 13 times higher odds of reporting a lifetime incidence of head injury. This relationship

explains that although we are unsure of the temporality of head injury, housing instability and victimization, there is work to be done to protect this population from further victimization.

Our two research questions for this study were each partially supported by this study. From our intersectional variables including gender, race, class and disability; class and disability were found to be significant. From our risk factor variables including housing instability, substance use and victimization; victimization was found to be significant. The variables which were not significant to the model included; gender (p=.061), race (p=.152), housing instability (p=0.694) and substance use(p=.055). It is worth noting that the study's small sample size and limited variability within the data set, may have reduced the power of the analysis and thus limited the ability to test for statistical relationships.

13 Implications and Recommendations

Significant relationships were found in this study including; education and head injury in people experiencing homelessness, physical health issues and head injury in people experiencing homelessness, mental health issues and head injury in people experiencing homelessness and victimization and head injury in people experiencing homelessness. Taking an intersectional approach allowed researchers to view other aspects of an individual's identity which may influence health inequities and the multiplicative effect on one's experiences such as experiencing head injury. Classism, ableism and victimization are the types of discrimination and oppression faced by this population creating conditions for them to be at higher odds of reporting a lifetime history of head injury.

Head injuries have been found to be a predictor as well as an outcome of experiencing homelessness (Cusimano et al., 2021). From this study we can see that although the mean age of first head injury was less than the mean age of homelessness in our study population, there are still issues that this population is facing including ongoing mental and physical health issues and victimization including assault, rape, mugging and burglary within the past year. This relationship may imply that head injury should not be

treated as an acute injury, rather a chronic illness with secondary effects that should be monitored and treatment adjusted throughout the course of an individual's lifetime. For people experiencing homelessness in particular, treatments should be person-centred and tailored to their specific needs (Gargaro et al., 2016). In addition, safety precautions for individuals experiencing homelessness should include both physical safety as well as cultural safety. Physical safety in and out of shelters is important as many individuals experience victimization in their living environments leading to assault (Cusimano et al., 2021). Cultural safety people experiencing homelessness through critical self-reflection by healthcare providers as well as examining issues of power at the structural and institutional level to reduce victimization, ableism, classism and racism (Hanafy et al., 2020; Heard et al., 2019; First Nations Health Authority, 2022).

Education and head injury in people experiencing homelessness was significant in this study as people who had their grade school as their highest level of education were at higher risk of head injury and individuals who had completed college/university had lower risk of having reported a head injury. Educational institutions must ensure programs are in place to accommodate and support people living with disabilities related to head injury in childhood/adolescence so that they can stay in school.

14 Study Limitations

This study included secondary analysis of data collected for NFAv2 and NFAv2x studies (Forchuk et al., 2020 & 2021), thus data were collected to address the purpose of the primary study and not the secondary analysis. Therefore, data collected was not specifically tailored to this study including the dependent variable (self-reported lifetime occurrence of head injury) which was obtained from the demographic and migration questionnaire instead of a validated screening tool. The questionnaire collecting dependent variable data did not have a specific definition, therefore it encompassed all types and severity of head injury. In addition, the self-reported nature of the question did leave room for possible recall bias.

The primary study collected data at baseline, one month, six months and at one year; however, this study used cross-sectional results from baseline data only as it had the most

participants with data available as some participants were lost to follow up. Due to the data being cross-sectional we were unable to determine causation from the results.

For this study, the final sample size was 121 for the logistic regression. The sample included people over the age of 18, who were experiencing homeless and who had been admitted to a medical or psychiatric unit at the hospital. As such, the study can only infer the relationships between independent and dependent variables and cannot be generalized to other populations. As stated earlier, due to the smaller sample size, variables were collapsed to ensure cell sizes were above 15. Although this helped to increase the power of the study, it might also have led to a loss of sensitivity to the levels of concern for some of these variables.

15 Conclusions

Head injuries are causing significant morbidity and mortality in Canada (PHAC, 2020). For people experiencing homelessness in this study, 51.2% have experienced a head injury in their lifetime. Relationships were found in this population among variables that were significantly related to higher levels of head injury in people experiencing homelessness, including low education level, mental health and physical health issues as well as victimization. Intersectional theory helps us to understand that head injury is an outcome that is affecting people experiencing homelessness inequitably, due to systems of power and control. In addition, low socioeconomic class, physical and mental disability and being a victim of a violent crime are individual identities which cause social injustices such as classism, ableism and victimization and are related to head injury in people experiencing homelessness. Awareness of these relationships is important to change the narrative around head injury in people experiencing homelessness from an incident that is self-induced to a societal problem to be solved though social, structural and environmental change.

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Chapter 3

16 Implications, Recommendations and Conclusions

16.1 Summary of Key Findings

Relationships between head injury in people experiencing homelessness and a number of possible risk factors were explored in this study. We examined relationships between and within aspects of the participant's identities such as; gender, race, class and disability as well as known risk factors including; housing instability, substance use and victimization. Using a binary logistic regression, we found that our model accounted for 36-48% of variance in head injury in people experiencing homelessness. Significant relationships were found between head injury in people experiencing homelessness and low education, mental and physical health issues, as well as victimization. In this chapter, we will expand on the implications this has on nursing and nursing practice, as well as recommendations for policy change and future research.

17 Implications for Nursing Practice

Current narratives in regards to head injury in people experiencing homelessness include that head injury is characteristically self-induced or due to substance abuse (Gargaro et al., 2016). These narrative places blame on the individual for circumstances that may be beyond their control. All nurses have a practice standard to uphold to protect the public and support the therapeutic nurse-client relationship including attention paid to the importance of trust, respect, professional intimacy, empathy and power (College of Nurses of Ontario, 2019). Cultural safety addresses power imbalances, stigma and judgment which are characteristic of the healthcare system. By engaging in cultural safety in nursing, patients can feel safe to access health care and be free from racism, sexism, classism or ableism secondary to power imbalances. To engage in cultural safety healthcare providers must practice cultural humility through critical self-reflection of their own values and beliefs. Formal education including cultural safety and humility is needed in order to safely care for vulnerable populations including people experiencing homelessness.

Findings from this study uncovered that victimization is related to head injury in people experiencing homelessness. Trauma- and Violence- informed care can be used as a framework to promote patient-centeredness and reduce barriers individuals may perceive as blocks to accessing safe healthcare. By implementing a trauma and victim informed approach to care shifts the position of the healthcare provider from a judgmental approach to a caring and compassionate approach which is empowering and more sensitive to patients who may have a longstanding history with trauma, victimization and head injury (Canadian Public Health Association, 2020; Trauma-Informed Care Implementation Resource Centre, 2021).

Head injuries often go unidentified in people experiencing homelessness (Synovec & Berry, 2020). With over 50% of people experiencing homelessness living with a head injury, nurses should complete a standard neurologic exam at all points of contact to assess for head injury routinely. Lifetime occurrence of head injury in people experiencing homelessness is related to mental and physical health issues within the past year and therefore may have more frequent contacts with the healthcare system. If a head injury is identified early, the healthcare team may be able to support the patient better thus providing the opportunity for better outcomes for the individual.

People who are experiencing homelessness with a head injury may not have completed high school. It may be difficult for individuals, especially with a head injury, to understand specific healthcare jargon and this can lead to a knowledge deficit upon discharge. As with all people who encounter the healthcare system, discharge instructions should be given at a grade four level using the teach-teach back method to ensure that discharge instructions are understood by all.

Nurses are advocates for their patients, specifically people experiencing homelessness, on all levels ranging from individual to a policy level. At an individual level, it can be spending extra time to assess a patient who has been hospitalized for exacerbation of their chronic mental or physical illness or a head injury. In the workplace, nurses can advocate for their colleagues to use more non-judgmental and inclusive language when they are working with people experiencing homelessness who have a head injury. On a larger

scale, nurses can lobby for more supports and less gaps in service for people who have experienced a head injury to their local government officials or engage in nursing research to create change.

18 Policy Recommendations

Head injury often occurs prior to homelessness (Cusimano et al., 2021; Hwang et al., 2008). Marmot et al. (2008), described health equity and actions to take to work towards population health. One of these actions was improvement of daily living conditions for Canadians. This still hold true today as daily living conditions are still not ensuring the safety and health of all Canadians.

Children need a safe environment to live, grow and learn. Level of education was related to history of head injury in people experiencing homelessness. Participants whose highest level of education was less than high school were more likely to report a head injury. Participants who reported completing college or university were 82% less likely to have reported a head injury in their lifetime. This relationship is imperative to the education sector, although more research is needed to understand this problem more thoroughly. Accommodation and support may be required for students who have sustained a head injury to ensure they are able to complete at least high school and either begin working or go on to obtain a college or university diploma. Many classrooms are pushed to their maximum capacity which would not allow for extra support to one student. Lower student-teacher ratios, educational assistants or specialized classrooms would be necessary to provide extra support and mentorship to these students.

Mental and physical health issues were also associated with head injury in people experiencing homelessness in this study. This highlights the need for better follow-up care and crisis support for individuals, specifically people experiencing homelessness who have experienced head injury. Telehealth or mobile (street) support may be required for vulnerable populations such as people experiencing homelessness.

Although income was not shown to be directly correlated with head injury in this study, 73% of participants were receiving less than $1169 dollars per month. This income was

mostly coming from government subsidy, Ontario Works (OW) or Ontario Disability Support Program (ODSP). In the past few years, housing in Ontario has become unaffordable on this amount of income. The government must re-evaluate the amount of subsidy given to these individuals as all Canadians should receive at least the amount to cover a healthy standard of living, especially for those unable to work due to disability. In addition, those who may be able to work require more opportunities for fair employment including; permanent work, benefits, flexible hours, safe working conditions and a living wage.

Finally, policies regarding safety and victimization need to be addressed in Ontario. Shelters are high risk environments for head injury in people experiencing homelessness, assault resulting in head injury is often financially motivated and not always preventable (Cusimano et al., 2021). If shelters are not safe for people experiencing homelessness, there are not many other options. Rough sleeping and trading sex for a place to sleep are also very high-risk environments that are associated with head injury in people experiencing homelessness (Heerde & Pallotta-Chiarolli, 2020). Safe housing should be of utmost importance to achieve a healthier population.

19 Recommendations for Future Research

Research on head injury in people experiencing homelessness is still growing. It is understood that head injury is a predictor and an outcome of people experiencing homelessness, but more studies are needed to better understand these relationships. For example, the relationship between education and head injury is not well documented or understood. It would be beneficial for future studies to examine the temporal relationship of head injury and education. Particularly, why there was a higher odds of head injury in participants who only completed grade school compared to those who completed college/university.

More longitudinal research with intervention groups to determine prevention and causation of head injury in people experiencing homelessness. In order to eradicate violence in childhood and also in people experiencing homelessness, we need more data to observe relationships and patterns in Canada. Public health measures are in place to

decrease head injury such as helmet use, air bags and seatbelts, but still more than 50% of people experiencing homelessness have experienced a head injury. What can we do to prevent head injury from assault? More information is needed to decrease head injury across the lifespan and across social gradients.

In addition, research on severity of brain damage from head injuries in people experiencing homelessness is needed. Many people report having multiple head injuries in their lifetime (Nikoo et al., 2017) and may have worsening symptoms and outcomes with each subsequent head injury due to brain damage.

20 Conclusions

We still have much to understand in regard to head injury in people experiencing homelessness. From this study, we have some more data regarding education, mental and physical health issues as well as victimization in relation to head injury in people experiencing homelessness. One implication of this research includes engaging healthcare providers, particularly nursing, in patient-focused and trauma-informed care so it can be integrated into their practice. Policy recommendations include; support for people who have experienced head injury across the lifespan, follow up care for head injury to include more long-term mental health and physical illness support as well as safety and victimization prevention including safe housing. This study can hopefully add to the knowledge base of head injury in people experiencing homelessness as we continue to strive for safety and health equity in people experiencing homelessness in Canada.

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Appendices

Appendix A- Demographic and Migration Form

Confidential

Preventing Discharge to "No Fixed Address" version 2
Page 1

Demographic And Migration Form

Record ID	_____
Were all instruments for this interview collected on the same date?	◯ Yes ◯ No
Date of Interview	_____
Age	_____ (years)
Sex	◯ Male ◯ Female ◯ Transgender ◯ Prefer not to disclose
At which hospital did you access the NFA v.2 program?	◯ Victoria Hospital (Department of Psychiatry) v.2 ◯ Victoria Hospital (Department of Medicine) v.2x ◯ University Hospital (Department of Medicine) v.2x ◯ Parkwood Institute (Department of Psychiatry) v.2
Family	
1. Marital status	◯ Single/ Never Married ◯ Separated/ Divorced ◯ Widowed ◯ Married/ Common Law ◯ Other ◯ Missed
Other (specify)	_____
2. Do you have any children?	◯ Yes ◯ No ◯ Missed
3a. Number Over 18	_____
3b. Number Under 18	_____
3c. Do you currently have custody?	◯ Yes ◯ No ◯ Other ◯ Missed
Other (specify)	_____

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4. Are you currently in contact with one or more members of your family?	◯ Yes ◯ No ◯ Missed
5. What is your current living arrangement?	◯ Lives with parent(s) ◯ Lives alone ◯ Lives with spouse/partner ◯ Lives with unrelated person ◯ Lives with other relative ◯ Inpatient ◯ Other ◯ Missed
Other (specify)	_____

Education, Employment and Income

6. Highest Level of Education	◯ Grade School ◯ High School ◯ Community College/ University ◯ Other ◯ Missed
Other (specify)	_____
7. Are you currently employed?	◯ Yes ◯ No ◯ Missed
Yes (specify)	_____

Mental Health and Addictions

8. Psychiatric diagnoses	☐ Developmental handicap ☐ Anxiety Disorder ☐ Disorder of childhood/adolescence ☐ Organic Disorder ☐ Substance-related disorder ☐ Personality Disorder ☐ Schizophrenia ☐ Other ☐ Mood Disorder ☐ Post Traumatic Stress Disorder ☐ Unknown ☐ Missed (check all that apply)
Other (specify)	_____
9. Age at first contact with mental health system	_____

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10. Have you ever had a psychiatric hospitalization?	◯ Yes ◯ No ◯ Missed
Age at first Psychiatric hospitalization	_____
Number of Psychiatric Admissions in last year	_____
Duration of current stay Go to calculateme to convert to days.	_____ (days)
How long since last admission Go to calculateme to convert to days.	_____ (days)
Estimated total number of psychiatric hospitalizations	_____
11. Are you currently on any medication for mental health issues?	◯ Yes ◯ No ◯ Missed
Specify Type	☐ antidepressant (e.g. Paxil, Seroquel) ☐ mood stabilizer (e.g. Epival, Lithium) ☐ antianxiety (e.g. Ativan, Clonazepam) ☐ antipsychotic (e.g. Risperidone, Seroquel) ☐ assistance with substances (methadone, antabuse) ☐ pain medication (e.g. Tylenol, Advil) ☐ Other ☐ Missed
Other (Specify)	_____
12. Have you ever been on any medication for mental health issues?	◯ Yes ◯ No ◯ Missed
Specify Type	☐ antidepressant (e.g. Paxil, Seroquel) ☐ mood stabilizer (e.g. Epival, Lithium) ☐ antianxiety (e.g. Ativan, Clonazepam) ☐ antipsychotic (e.g. Risperidone, Seroquel) ☐ assistance with substances (methadone, antabuse) ☐ pain medication (e.g. Tylenol, Advil) ☐ Other ☐ Missed
Other (specify)	_____

13. Do you currently have any substance/addiction issues?	◯ Yes ◯ No ◯ Missed
Specify Type	☐ Alcohol ☐ Tobacco ☐ Caffeine ☐ Marijuana ☐ Cocaine/Crack ☐ Hallucinogens ☐ Heroin ☐ Prescription drugs ☐ Other ☐ Missed
Prescription (specify)	_____
Other (specify)	_____
14. Have you had any substance/addiction issues in the past?	◯ Yes ◯ No ◯ Missed
Yes (specify)	☐ Alcohol ☐ Tobacco ☐ Caffeine ☐ Marijuana ☐ Cocaine/Crack ☐ Hallucinogens ☐ Heroin ☐ Prescription drugs ☐ Other ☐ Missed
Prescription (specify)	_____
Other (specify)	_____
15. Do you have any chronic physical illness?	◯ Yes ◯ No ◯ Missed

Yes (specify)	☐ Diabetes ☐ Heart condition ☐ Arthritis ☐ High blood pressure ☐ Cancer ☐ Respiratory illnesses ☐ Kidney/Urinary illnesses ☐ Hepatitis/Liver illnesses ☐ Epilepsy ☐ Autoimmune diseases (Crohn's, Lupus, Ulcerative Colitis) ☐ HIV/AIDS ☐ Osteoporosis ☐ Neurological/brain disorder ☐ Other ☐ Missed
Cancer (specify)	_____
Other (specify)	_____
16. Have you ever had a head injury?	○ Yes ○ No ○ Missed
17. How old were you when this happened (first)?	_____
How many times injured?	_____
18. Have you ever been homeless?	○ Yes ○ No ○ Missed
19. How old were you when this happened first?	_____
20. How many times homeless?	_____

Homelessness, Migration and Transience Section

1. Gender	○ Female ○ Male ○ Transgender ○ Missed
2a. What are the reason(s) that you are at-risk of homelessness AND/OR absolutely homeless?	○ Applicable ○ Not Applicable ○ Missed

Reasons For Being At-Risk For Homelessness	☐ Unemployment ☐ Seeking work ☐ Low wages ☐ Unable to pay rent or mortgage ☐ Evicted ☐ Mental illness ☐ Physical illness or disability ☐ Welfare cheque late ☐ Welfare payment is inadequate/low ☐ Welfare cut-off ☐ Doesn't qualify for welfare benefits ☐ Family events or problems ☐ Divorce ☐ Out of jail/incarceration ☐ Substance abuse ☐ Transient or migrant ☐ Other ☐ Missed
Other (specify)	_____
Reasons for Being Absolutely Homeless	☐ Unemployment ☐ Seeking work ☐ Low wages ☐ Unable to pay rent or mortgage ☐ Evicted ☐ Mental illness ☐ Physical illness or disability ☐ Welfare cheque late ☐ Welfare payment is inadequate/low ☐ Welfare cut-off ☐ Doesn't qualify for welfare benefits ☐ Family events or problems ☐ Divorce ☐ Out of jail/incarceration ☐ Substance abuse ☐ Transient or migrant ☐ Other ☐ Missed
Other (specify)	_____
2b. Do you meet the definition of absolute homeless?	◯ Yes ◯ No ◯ Missed
2c. Do you meet the definition of being at-risk for homeless?	◯ Yes ◯ No ◯ Missed

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3. Income Status	☐ Have no income ☐ Welfare (Ontario Works) ☐ ODSP (Ontario Disability Support Program) ☐ CPP (Canada Pension Plan) ☐ EI (Employment Insurance) ☐ OAS (Old Age Security) ☐ WSIB (Workers Compensation) ☐ War Veterans Allowance ☐ Private pension ☐ Employment ☐ Other ☐ Missed
Other (specify)	_____
4. Ethnic/racial/cultural group	◯ European origins (Caucasian) ◯ Aboriginal ◯ Visible minority ◯ Other ◯ Missed
Aboriginal (specify)	_____
Visible minority (specify)	_____
Other (specify)	_____
5. What language was first learned as a child and is still spoken?	☐ English ☐ French ☐ Algonquin, Cree, Ojibwe, Oji-Cree, Mohawk, or other First Nation language ☐ Other ☐ Missed
First Nation Language (specify)	_____
Other (specify)	_____
6. Marital/ Family Status	◯ Married/ Common Law ◯ Single ◯ Divorced/Separated ◯ Widowed ◯ Other ◯ Missed

Confidential

Other (specify)	_____
7. Number of children or other dependents	_____
8a. Do you have any children who are accompanying you?	◯ Yes ◯ No ◯ MIssed
8b. Do you have children who are in your custody?	◯ Yes ◯ No ◯ Missed
9a. Child #1	◯ Female ◯ Male ◯ Transgender ◯ Missed
9b. Child #1 Age	_____
9c. Child #2	◯ Female ◯ Male ◯ Transgender ◯ Missed
9d. Child #2 Age	_____
9e. Child #3	◯ Female ◯ Male ◯ Transgender ◯ Missed
9f. Child #3 Age	_____
9g. Child #4	◯ Female ◯ Male ◯ Transgender ◯ Missed
9h. Child #4 Age	_____
9i. Child #5	◯ Female ◯ Male ◯ Transgender ◯ Missed
9j. Child #5 Age	_____

Confidential

10. In the last year, have you had any mental health problems?	◯ Yes ◯ No ◯ Missed
Yes (describe)	_____
11. In the last year, have you had any physical health problems?	◯ Yes ◯ No ◯ Missed
Yes (describe)	_____
12a. Have you been absolutely homeless in your lifetime?	◯ Yes ◯ No ◯ Missed
12b. Have you been absolutely homeless in the last year?	◯ Yes ◯ No ◯ Missed
12c. Have you in the last year, slept outdoors/on the streets because you had nowhere to go?	◯ Yes ◯ No ◯ Missed

Transience and migration

13. Were you born in London?	◯ Yes ◯ No ◯ Missed
14. Is London your home community?	◯ Yes ◯ No ◯ Missed
15a. Specify your home community	◯ in the London area ◯ other South-West Ontario area ◯ in Central Ontario ◯ in Toronto Ontario area ◯ in East Ontario ◯ in North-East Ontario ◯ in North-West Ontario ◯ in another province or territory ◯ in another country ◯ Missed
15a. Specify the community/country	_____
15b. Have you recently returned to London after living somewhere else?	◯ Yes ◯ No ◯ Missed

15b. Where?	◯ in the London area ◯ other South-West Ontario area ◯ in Central Ontario ◯ in Toronto Ontario area ◯ in East Ontario ◯ in North-East Ontario ◯ in North-West Ontario ◯ in another province or territory ◯ in another country ◯ Missed
15b. Specify the community/country	_____
16a. Please indicate how long you have been in London (select input type)	☐ Days ☐ Months ☐ Years ☐ Missed
16b. How long have you been in London?	_____ (days)
16b. How long have you been in London?	_____ (months)
16b. How long have you been in London?	_____ (years)
17. How many times have you moved to a different community in the last year?	_____
18. How many times have you moved to a different community in the last 5 years?	_____

19. Why did you leave another community to come to London?	☐ Unemployment ☐ Unable to obtain welfare/didn't qualify ☐ Seeking work in London ☐ Welfare cheque was late ☐ Low wages ☐ Welfare payments inadequate/too low ☐ Unable to pay rent or mortgage ☐ Welfare was cut-off ☐ Evicted ☐ Family events or problems ☐ Mental illness ☐ Divorce ☐ Physical illness or disability ☐ Family violence ☐ To access health or social services ☐ Out of jail/prison ☐ To access education ☐ Substance use (alcohol or drugs) ☐ Encouraged/helped to come to London ☐ Wanted a change ☐ Other ☐ Missed
Other (specify)	_____
Who helped you leave another community to come to London?	☐ family ☐ friends/acquaintances ☐ services ☐ Missed
20. Did you come to London with someone else?	◯ Yes ◯ No ◯ Not Applicable ◯ Missed
20b. Who?	_____
21. Did circumstances improve when you came to London?	◯ Yes ◯ No ◯ Not Applicable ◯ Missed
22. Where are you currently staying in London?	◯ Own place ◯ Family ◯ Friends ◯ A Shelter ◯ Streets ◯ Other ◯ Missed
Other (please specify)	_____

23. Has anyone in London helped you with challenges or difficulties?	◯ Yes ◯ No ◯ Missed
Who?	_____
24. Are you planning to stay in London?	◯ Yes ◯ No ◯ Missed
25. Where will you go?	_____
26. What do you need right now?	_____

Appendix B- Housing History Survey

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Type of Residence

- ○ 1. Group home (permanent) - Level I (24 hour support)
- ○ 2. Group home (permanent) - Level II (daily support)
- ○ 3. Group home (permanent) - Level III (weekly support)
- ○ 4. Group home (permanent) - (less than weekly but more than monthly support)
- ○ 5. Group home (permanent) - (less than monthly but more than annually)
- ○ 6. Apartment (permanent) - Level I (24 hour support)
- ○ 7. Apartment (permanent) - Level II (daily support)
- ○ 8. Apartment (permanent) - Level III (weekly support)
- ○ 9. Apartment (permanent) - (less than weekly but more than monthly support)
- ○ 10. Apartment (permanent) - (less than monthly but more than annually)
- ○ 11. Halfway house (transitional) - Level I (24 hour support)
- ○ 12. Halfway house (transitional) - Level II (daily support)
- ○ 13. Halfway house (transitional) - Level III (weekly support)
- ○ 14. Halfway house (transitional) - (less than weekly but more than monthly support)
- ○ 15. Halfway house (transitional) - (less than monthly but more than annually)
- ○ 16. Apartment (transitional) - Level I (24 hour support)
- ○ 17. Apartment (transitional) - Level II (daily support)
- ○ 18. Apartment (transitional) - Level III (weekly support)
- ○ 19. Apartment (transitional) - (less than weekly but more than monthly support)
- ○ 20. Apartment (transitional) - (less than monthly but more than annually)
- ○ 21. Private apartment or house
- ○ 22. Social/Public apartment or house
- ○ 23. Unregulated rooming house (no meals provided)
- ○ 24. Unregulated room-and-board (includes meals, no program or supervision)
- ○ 25. Unregulated room-and-board (includes meals and supervision)
- ○ 26. Home for Special Care
- ○ 27. Parent's home
- ○ 28. Foster family
- ○ 29. Hostel -- Emergency
- ○ 30. Hostel - Transitional
- ○ 31. Hostel - Long Term
- ○ 32. Psychiatric hospital
- ○ 33. General hospital psychiatric unit
- ○ 34. General hospital non-psychiatric unit
- ○ 35. Jail or prison
- ○ 36. Nursing home/Long Term care home
- ○ 37. Residential Treatment Home
- ○ 38. Group independent living
- ○ 39. Congregate model (apartment with shared social space and meals provided)
- ○ 40. Hotel
- ○ 41. Other

Other - Specify	_____
Type of Residence - Describe	_____
Type of Residence - City	_____
Length of Time (Weeks) (If less than 1 week, enter '0') Go to calculateme to convert to days.	_____
Length of Time (Days) Go to calculateme to convert to days.	_____
Chronology	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○ 11 ○ 12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ 18 ○ 19 ○ 20
Reason for Move	○ 1. Internally controlled - desired change, perceived as self-motivated ○ 2. Externally controlled - not a desired change, perceived as being caused by external forces ○ 3. N/A - Current residence
Reason for Move - describe	_____

Housing Satisfaction Scale (delighted/terrible scale)	○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ missed
Another Residence?	○ Yes ○ No
More than 20 residents? - Describe	_____
How many undesirable moves have you had in the last 5 years?	_____

Appendix C- Lehman Quality of Life Questionnaire

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Lehman Quality of Life

Record ID _____

Date of Interview: [date_of_interview]

Date of Interview _____

Time Began _____

Section A - General Life Satisfaction

1. General Life Satisfaction

- ◯ 1 - Terrible
- ◯ 2 - Unhappy
- ◯ 3 - Mostly Dissatisfied
- ◯ 4 - Mixed
- ◯ 5 - Mostly Satisfied
- ◯ 6 - Pleased
- ◯ 7 - Delighted
- ◯ Missed

Section B: Living Situation

1. What is your current living situation?

IF RESPONDENT IS CURRENTLY IN THE HOSPITAL, AND THIS HOSPITALIZATION HAS LASTED LESS THAN 3 MONTHS, LIVING SITUATION=LIVING SITUATION JUST PRIOR TO HOSPITALIZATION. IF THE HOSPITALIZATION HAS BEEN FOR 3 MONTHS OR MORE, CODE "HOSPITAL

- ◯ 01 Hospital
- ◯ 02 Skilled nursing facility: 24 hour nursing service
- ◯ 03 Intermediate care facility: less than 24 hour nursing facility
- ◯ 04 Supervised group living: (generally long term)
- ◯ 05 Transitional group home: (halfway or quarterway house)
- ◯ 06 Family foster care
- ◯ 07 Cooperative apartment, supervised (staff on premises)
- ◯ 08 Cooperative apartment, unsupervised (staff not on premises)
- ◯ 09 Board and care home: (private proprietary home for adults, with program and supervision)
- ◯ 10 Boarding house: (includes meals, no program or supervision)
- ◯ 11 Rooming or boarding house or hotel: (includes single room occupancy, no meals are provided, cooking facilities may be available)
- ◯ 12 Private house or apartment
- ◯ 13 Shelter
- ◯ 14 Jail
- ◯ 15 No current residence (including the streets, bus stations, missions, etc.)
- ◯ 16 Other
- ◯ 00 No information

Other (specify) _____

2. Using the above codes, list in order the places you have lived during the past year, including psychiatric hospitalizations, beginning with your current living situation	
Current living situation (A)	_____
Next (B)	_____
Next (C)	_____
Next (D)	_____
Next (E)	_____
Next (F)	_____
Total number of different, non-hospital residences, during the past year?	_____
3. Which of these was your usual residence during the past year?	_____
4. IF RESPONDENT IS CURRENTLY IN THE HOSPITAL FOR LESS THAN 3 MONTHS, USE MORE RECENT RESIDENCE PRIOR TO HOSPITALIZATION. IF RESPONDENT IS IN THE HOSPITAL 3 MONTHS OR MORE, USE HOSPITAL AS THE RESIDENCE. SKIP IF HOMELESS Currently homeless?	○ yes ○ no

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
4A. How do you feel about the living arrangements where you live?	○	○	○	○	○	○	○	○
4B. How do you feel about the privacy you have there?	○	○	○	○	○	○	○	○
4C. How do you feel about the prospect of staying on where you currently live for a long period of time?	○	○	○	○	○	○	○	○

Section C: Daily Activities & Functioning

1. Now let's talk about some of the things you did with your time in the past week. I'm going to read you a list of things people may do with their free time. For each of these, please tell me if you did it during the past week. Did you:

	Yes	No	Missed
A. Go for a walk?	○	○	○
B. Go shopping?	○	○	○
C. Go to a restaurant or coffee shop?	○	○	○
D. Read a book, magazine, or newspaper?	○	○	○
E. Go for a ride in a bus or car?	○	○	○
F. Work on a hobby?	○	○	○
G. Play a sport?	○	○	○
H. Go to a park	○	○	○

2. Overall, how would you rate your functioning in home, social, school, and work settings at the present time?

- ○ Excellent
- ○ Good
- ○ Fair
- ○ Poor
- ○ Missed

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
3A. How do you feel about the way you spend your spare time?	○	○	○	○	○	○	○	○
3B. How do you feel about the chance you have to enjoy pleasant or beautiful things?	○	○	○	○	○	○	○	○
3C. How do you feel about the amount of fun you have?	○	○	○	○	○	○	○	○
3D. How do you feel about the amount of relaxation in your life?	○	○	○	○	○	○	○	○

Section D: Family

1. In the past year, how often did you talk to a member of your family on the telephone?

- ○ At least once a day
- ○ At least once a week
- ○ At least once a month
- ○ Less than once a month but at least once during the year
- ○ Not at all
- ○ No family
- ○ Missed

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2. In the past year, how often did you get together with a member of your family?

- ○ At least once a day
- ○ At least once a week
- ○ At least once a month
- ○ Less than once a month but at least once during the year
- ○ Not at all
- ○ No family
- ○ Missed

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
3A. How do you feel about the way you and your family act toward each other?	○	○	○	○	○	○	○	○
3B. How do you feel about the way things are in general between you and your family?	○	○	○	○	○	○	○	○

Section E: Social Relations

1. About how often do you do the following?

	At least once a day	Once a week	Once a month	Less than once a month	Not at all	Missed
A. Visit with someone who does not live with you?	○	○	○	○	○	○
B. Telephone someone who does not live with you?	○	○	○	○	○	○
C. Do something with another person that you planned ahead of time?	○	○	○	○	○	○
D. Spend time with someone you consider more than a friend, like a spouse, a boyfriend or a girlfriend?	○	○	○	○	○	○

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
2A. How do you feel about the things you do with other people?	○	○	○	○	○	○	○	○
2B. How do you feel about the amount of time you spend with other people?	○	○	○	○	○	○	○	○
2C. How do you feel about the people you see socially?	○	○	○	○	○	○	○	○

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Section F: Finances

1. In the past year have you had any financial support from the following sources?

- ☐ A. Earned Income
- ☐ B. Social Security Benefits (SSA)
- ☐ C. Social Security Disability Income (SSDI)
- ☐ D. Supplemental Security Income (SSI)
- ☐ E. Armed Service connected disability payments
- ☐ F. Other Social Welfare benefits-state or county (general welfare, Aid to Families with Dependent Children (AFDC))
- ☐ G. Vocational program (Comprehensive Employment and Training Act (CETA), Vocational Rehabilitation, sheltered workshop)
- ☐ H. Unemployment compensation
- ☐ I. Retirement, investment or savings income
- ☐ J. Rent supplements (including HUD, Section 8 certificates, living programs receiving public assistance support)
- ☐ K. Alimony and child support
- ☐ L. Food stamps
- ☐ M. Family and/or spouse contribution
- ☐ N. Other source(s)
- ☐ Missed

Other (specify) _____

2. How much money did you receive during the past month from all of these sources? _____ ($)

3. On the average, how much money did you have to spend on yourself in the past month, not counting money for room and meals? _____ ($)

Interviewer Rating

- ○ Very Reliable
- ○ Generally Reliable
- ○ Generally Unreliable
- ○ Very Unreliable
- ○ Missed

	Yes	No	Missed
4A. During the past year did you generally have enough money each month to cover food?	○	○	○
4B. During the past year did you generally have enough money each month to cover clothing?	○	○	○
4C. During the past year did you generally have enough money each month to cover housing?	○	○	○

4D. During the past year did you generally have enough money each month to cover traveling around the city for things like shopping, medical appointments, or vising friends and relatives?	○	○	○
4E. During the past year did you generally have enough money each month to cover social activities like movies or eating in restaurants?	○	○	○

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
5A. How do you feel about the amount of money you get?	○	○	○	○	○	○	○	○
5B. How do you feel about how comfortable and well-off you are financially?	○	○	○	○	○	○	○	○
5C. How do you feel about the amount of money you have available to spend for fun?	○	○	○	○	○	○	○	○

Section G: Work and School

1. Have you worked during the past year?
- ○ Currently working
- ○ Yes, worked in the past year but not currently employed
- ○ No work in the past year
- ○ Missing

2. What kind of work do you do at the present time? _____

3. How many hours a week do you usually work? _____

4. How much do you earn per hour at this job?
Can enter week calculation below instead _____

How much do you earn per week at this job? _____

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
5A. How do you feel about your job?	O	O	O	O	O	O	O	O
5B. How do you feel about what it is like where you work (the physical surroundings)?	O	O	O	O	O	O	O	O
5C. How do you feel about the amount you get paid?	O	O	O	O	O	O	O	O

Section H: Legal & Safety Issues

1. In the past year, were you a victim of:

	Yes	No	Missed
A. Any violent crimes such as assault, rape, mugging, or robbery?	O	O	O
B. Any nonviolent crimes such as burglary, theft of your property or money, or being cheated?	O	O	O

2. In the past year, have you been arrested or picked-up for any crimes?

O Yes
O No
O Missed

Number of arrests _____

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfied	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
3A. How do you feel about how safe you are on the streets in your neighborhood?	O	O	O	O	O	O	O	O
3B. How do you feel about how safe you are where you live?	O	O	O	O	O	O	O	O
3C. How do you feel about the protection you have against being robbed or attacked?	O	O	O	O	O	O	O	O

Section I: Health

1. In general, would you say your health is:

O Excellent
O Very good
O Good
O Fair
O Poor
O Missed

	1 - Terrible	2 - Unhappy	3 - Mostly Dissatisfie	4 - Mixed	5 - Mostly Satisfied	6 - Pleased	7 - Delighted	Missed
2A. How do you feel about your health in general?	○	○	○	○	○	○	○	○
2B. How do you feel about your physical condition?	○	○	○	○	○	○	○	○
2C. How do you feel about your emotional well-being?	○	○	○	○	○	○	○	○

Section J: Global Rating

1. How do you feel about:
Your life in general?

- ○ 1 - Terrible
- ○ 2 - Unhappy
- ○ 3 - Mostly Dissatisfied
- ○ 4 - Mixed
- ○ 5 - Mostly Satisfied
- ○ 6 - Pleased
- ○ 7 - Delighted
- ○ Missed

Time End _____

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Appendix D- Demographic Variables

Age		
	Valid	121
	Missing	0
	Mean	39.57
	Median	38
	Mode	26
	Std. Deviation	12.93
	Skewness	0.68
	Std. Error of Skewness	0.22
	Kurtosis	0.17
	Std. Error of Kurtosis	0.43
	Range	63
	Minimum	18
	Maximum	81
Sex/Gender ***Consistent across demographic/migration questionnaire**	Man	71 (58.7%)
	Woman	50 (41.3%)
	Transgender	0 (0%)
	Prefer not to disclose	0 (0%)
Marital Status	Single/never married	79 (65.3%)
	Separated/divorced	32 (26.4%)
	Widowed	4 (3.3%)
	Married/Common Law	6 (5%)
Do you have any children?	Yes	57 (47.1)
	No	64 (52.9)
	Children Under 18	68 (54%)
	Children Over 18	72 (57.1%)
	Current Custody	
	Yes	6 (6.3%)
	No	34 (37%)
	Other*	22 (18.3%)
	Missed	2 (1.6%)
	*Other: split custody, over 18	

Are you Currently in contact with one or more members of your family?	Yes No Missed	99 (81.8%) 19 (15.7%) 3 (2.5%)
Highest level of Education	Grade school High school Community college/university Other	34 (28.1%) 47 (38.8%) 40 (33.1%) 0 (0%)
Are you currently employed?	Yes No	4 (3.3%) 117 (96.7%)
Psychiatric Diagnosis	Developmental Handicap Anxiety disorder Disorder of childhood/adolescence Organic disorder Substance-related disorder Personality disorder Schizophrenia Other* Mood disorder Post-traumatic stress disorder Unknown *Other: type A personality, night terrors, panic attacks, suicidal/self-harm, obsessive compulsive disorder, emotional distress/ grieving, separation disorder, hallucinations, psychosis, acquired brain injury, serotonin syndrome, anorexia, sleep disorder, danger to others	2 (1.7%) 43 (35.5%) 8 (6.6%) 1 (0.8%) 11 (9.1%) 17 (14%) 22 (18.2%) 26 (20.6%) 64 (52.8%) 28 (23.1%) 11 (9.1%)

Age at first contact with the mental health system	Valid	107
	Missing	14
	Mean	24.4
	Median	21
	Mode	15
	Std. Deviation	13.12
	Skewness	1.68
	Std. Error of Skewness	0.23
	Kurtosis	3.77
	Std. Error of Kurtosis	0.46
	Range	75
	Minimum	2
	Maximum	77
Have you ever had a psychiatric hospitalization?	Yes	10 (83.5%)
	No	16 (13.2%)
	Missed	4 (3.2%)
Age at first psychiatric hospitalization	Valid	100
	Missing	21
	Mean	27.14
	Median	23.5
	Mode	18
	Std. Deviation	12.46
	Skewness	1.42
	Std. Error of Skewness	0.24
	Kurtosis	2.48
	Std. Error of Kurtosis	0.48
	Range	68
	Minimum	9
	Maximum	77
Number of psychiatric admissions in the past year?	Valid	99
	Missing	22
	Mean	2.13
	Median	1
	Mode	1
	Std. Deviation	2.71
	Skewness	4.24
	Std. Error of Skewness	0.24

	Kurtosis Std. Error of Kurtosis Range Minimum Maximum	22.09 0.48 20 0 20
Do you currently have any substance/addiction issues?	Yes No	85 (67.5%) 41 (32.5%)
Yes, Specify	Alcohol Tobacco Caffeine Marijuana Cocaine/Crack Hallucinogens Heroin Prescription drugs Other* *Other: methamphetamine, speed, fentanyl, opiates, nicotine vaporizer, “uppers,” methadone	20 (16.5%) 59 (48.8%) 33 (27.3%) 21 (17.4%) 8 (6.6%) 1 (0.8%) 9 (7.1%) 18 (14.3%) 15 (11.9%)
Have you had any substance/addiction issues in the past?	Yes No	92 (76%) 29 (24%)
Yes, specify	Alcohol Tobacco Caffeine Marijuana Cocaine/Crack Hallucinogens Heroin Prescription drugs Other*	53 (43.8%) 54 (44.6%) 37 (30.6%) 40 (33.1%) 41 (33.9%) 15 (12.4%) 13 (10.7%) 31 (25.6%) 14 (11.6%)

	*Other: methamphetamine, MDMA, speed, oxycodone, LSD, ecstasy, prefer not to specify, morphine, fentanyl, Ritalin, food	
Do you have any chronic physical illness?	Yes No Missing	75 (62%) 45 (37.2%) 1 (0.8%)
Yes, Specify	Diabetes Heart Condition Arthritis High Blood Pressure Cancer Respiratory Illnesses Kidney/ Urinary Illness Hepatitis/Liver Illnesses Epilepsy Auto Immune Diseases HIV/AIDS Osteoporosis Neurological brain disorder Other* Missed *Other: back pain, fibromyalgia, degenerative disk disease, hernia, gastrointestinal issues, fatigue, high cholesterol, hypothyroid, low blood pressure, cellulitis, MRSA, Irregular pap smear, knee pain, sciatica, endometriosis, eating disorder, scoliosis, sleep	9 (7.4%) 8 (6.6%) 13 (10.7%) 11 (9.1%) 1 (0.8%) 10 (8.3%) 2 (1.7%) 13 (10.7%) 3 (2.5%) 2 (1.7%) 1 (0.8%) 1 (0.8%) 6 (5%) 47 (38.8%) 1 (0.8%)

	apnea, eye issues, transient ischemic attack (TIA), skin problems, polycystic ovarian syndrome, headaches, acid reflux, spina bifida	
Have you ever had a head injury?	Yes No	62 (51.2%) 59 (48.8%)
When did head injury happen first?	Valid Missing Mean Median Mode Std. Deviation Skewness Std. Error of Skewness Kurtosis Std. Error of Kurtosis Range Minimum Maximum	60 61 15.22 12 10 13.14 2.38 0.31 7.96 0.61 76 1 77
How many times head injury?	Valid Missing Mean Median Mode Std. Deviation Skewness Std. Error of Skewness Kurtosis Std. Error of Kurtosis Range Minimum Maximum	59 62 7.44 3 1 14.77 4.85 0.31 27.72 0.61 99 1 100
Have you ever been homeless?	Yes No	98 (81%) 23 (19%)

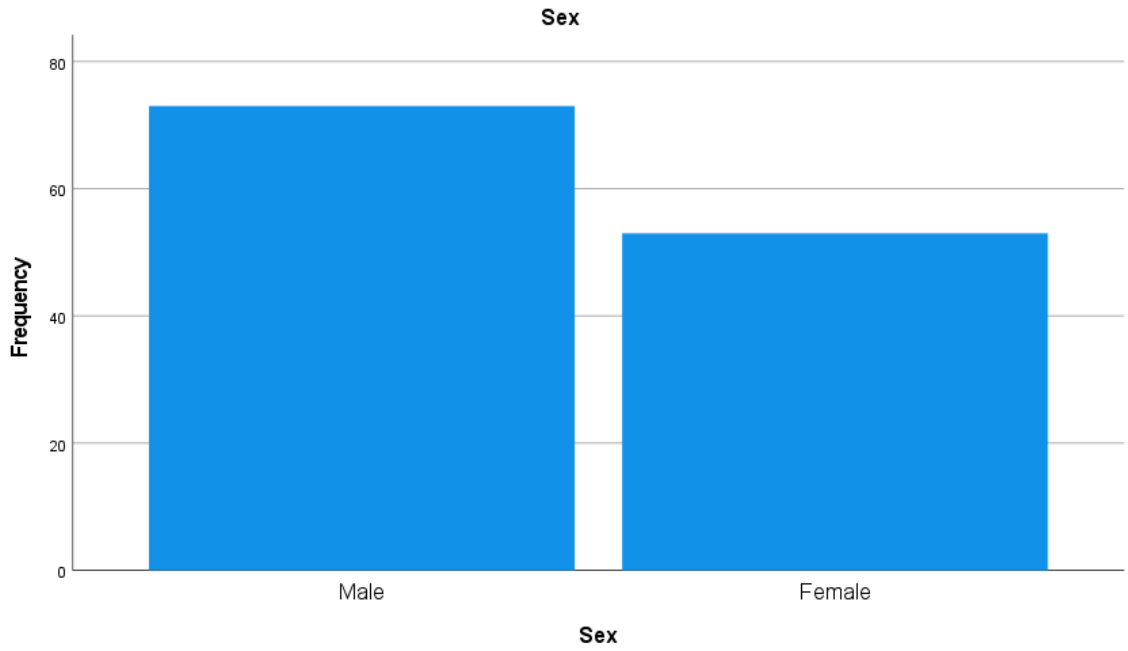
When did homelessness happen first?	Valid	94
	Missing	27
	Mean	30.21
	Median	28
	Mode	18
	Std. Deviation	14.42
	Skewness	0.95
	Std. Error of Skewness	0.25
	Kurtosis	0.49
	Std. Error of Kurtosis	0.49
	Range	65
	Minimum	11
	Maximum	76
How many times homeless?	Valid	93
	Missing	28
	Mean	3.34
	Median	2
	Mode	1
	Std. Deviation	3.99
	Skewness	2.59
	Std. Error of Skewness	0.25
	Kurtosis	6.90
	Std. Error of Kurtosis	0.50
	Range	20
	Minimum	0
	Maximum	20
Income status	Have no income	7 (5.8%)
	Welfare (Ontario Works)	27 (22.3%)
	Ontario disability support program (ODSP)	70 (57.9%)
	Canada Pension Plan (CPP)	14 (11.6%)
	Employment Insurance	1 (10.8%)
	Old Age Security	3 (2.5%)
	Workers Compensation	3 (2.5%)
	War Veterans Allowance	0 (0%)
	Private Pension	1 (0.8%)

	Employment Other* *Other: child tax benefit, trillium, GST, pan handling, gift from family, SST, GIS, CI, union benefits, OSAP, long term disability insurance, Children's Aid Society,	3 (2.5%) 18 (14.9%)
Racial/Ethnic/cultural group	European Origins (Caucasian) Indigenous Visible Minority Other* *Other: Turkish, Spanish, white and black mixed, Eurasian, Half east Indian, Middle Eastern, European and Japanese, Caribbean, European and Aboriginal	90 (74.4%) 16 (12.6%) 7 (5.5%) 9 (7.4%)
Language First learned and still speak	English French Algonquin, Cree, Ojibwe, Oji-Cree, Mohawk, or other First Nation language Other* *Other: Arabic, Spanish, Bulgarian, Gaelic, Polish, Hungarian, German, Italian, Finnish, Serbian/Croatian, Russian, Dutch, Albanian, Swahili,	104 (86%) 5 (4.1%) 0 (0%) 18 (14.9%)

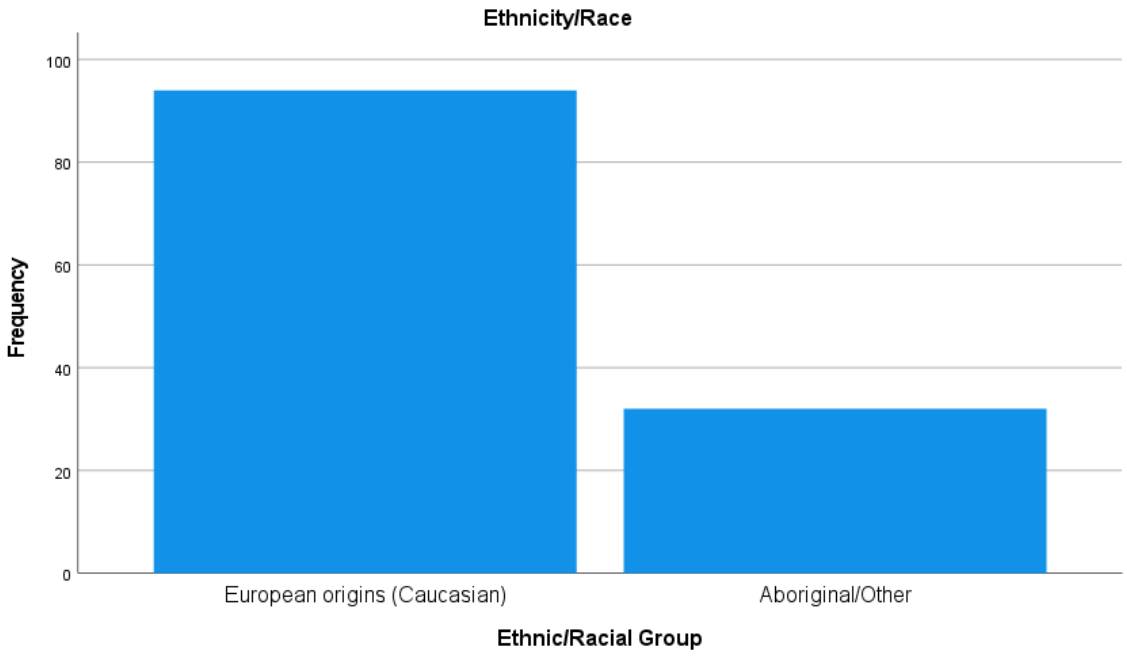
	Mandarin, Hon, Romanian,	

Appendix E- Independent Variables: Frequencies and Bar Charts

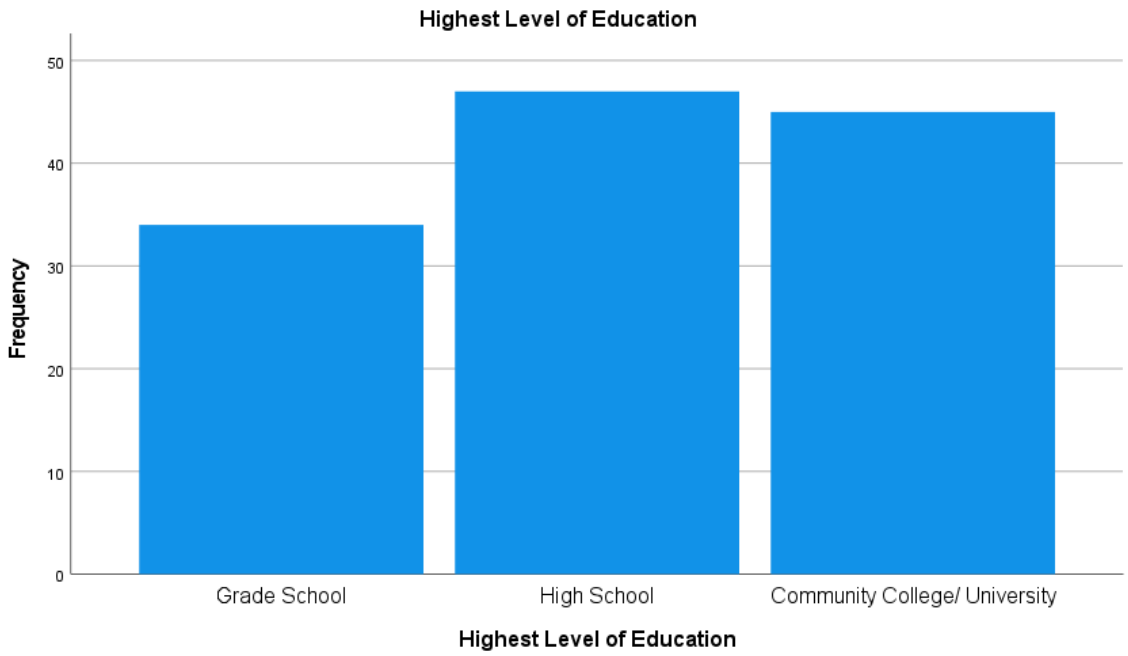
Gender		**Frequency**	**Percent**
Valid	Man	71	58.7%
	Woman	50	41.3%
Missing		0	0%
Total		121	100%



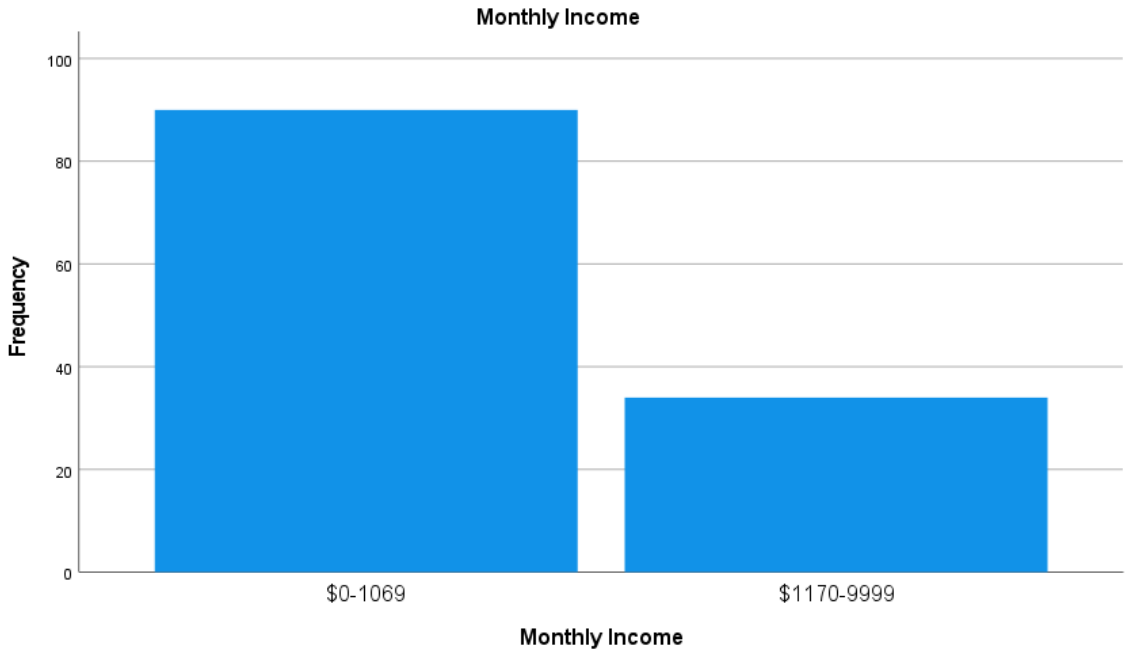
Race		Frequency	Percent
Valid	European (Caucasian)	90	74.4%
	Aboriginal/Other	31	25.6%
Missing		0	0%
Total		121	100%



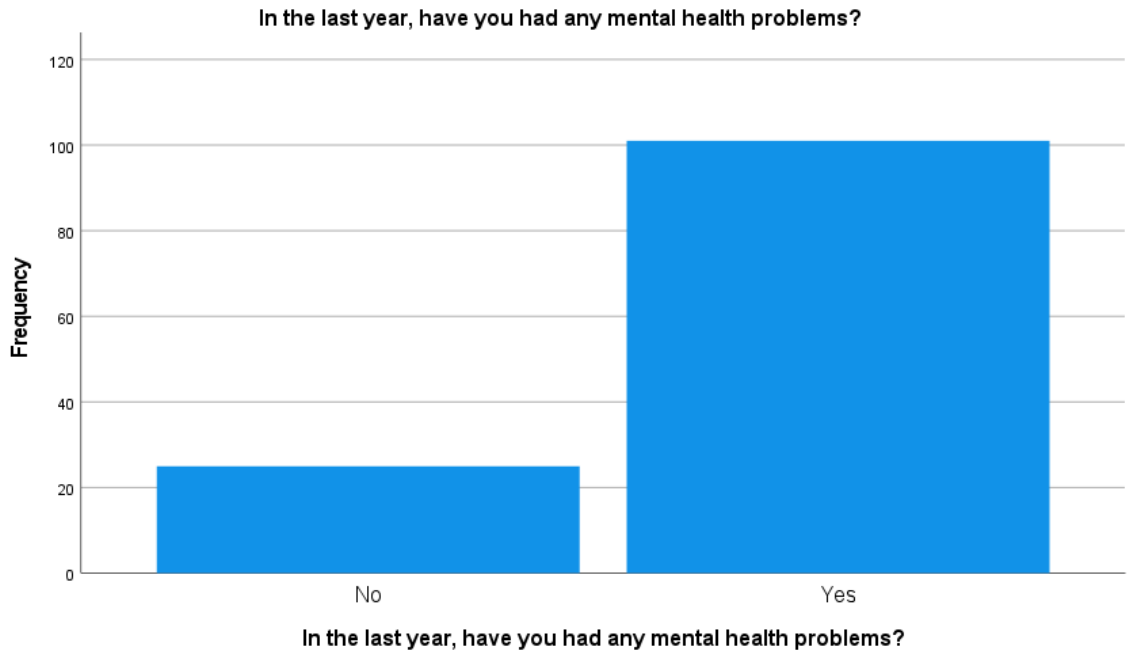
Highest Level of Education		Frequency	Percent
Valid	Grade School	34	28.1%
	High School	47	38.8%
	Community College/University	40	33.1%
Missing		0	0%
Total		121	100%



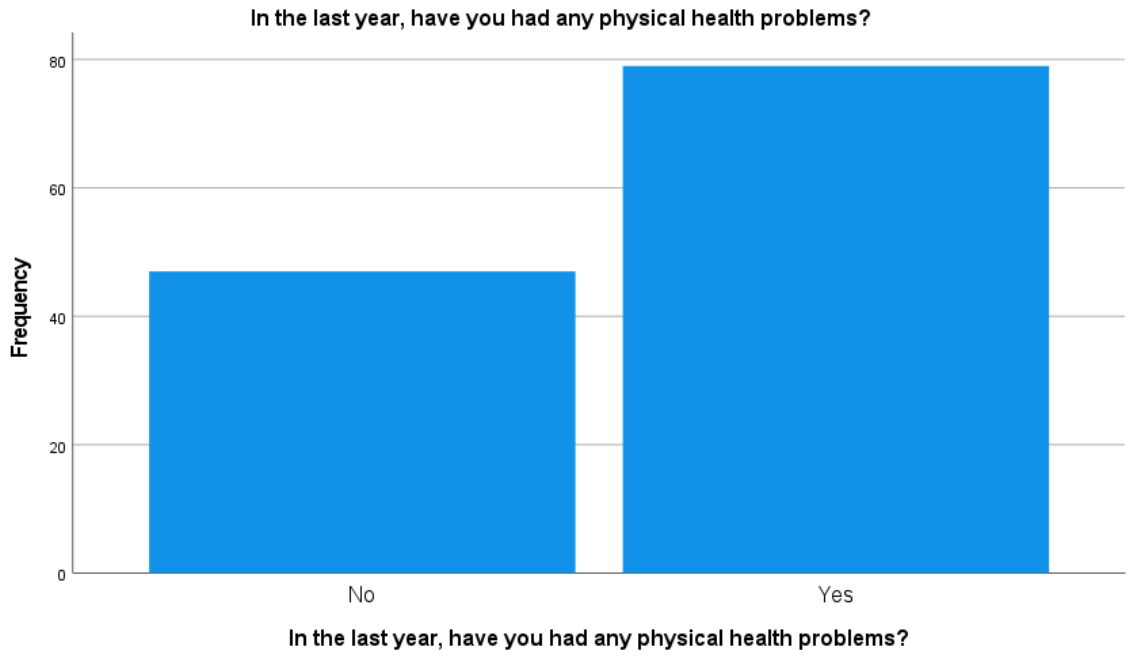
Monthly Income		Frequency	Percent
Valid	0-1169	88	72.7%
	1169-3000	33	27.3%
Missing		0	0%
Total		121	100%



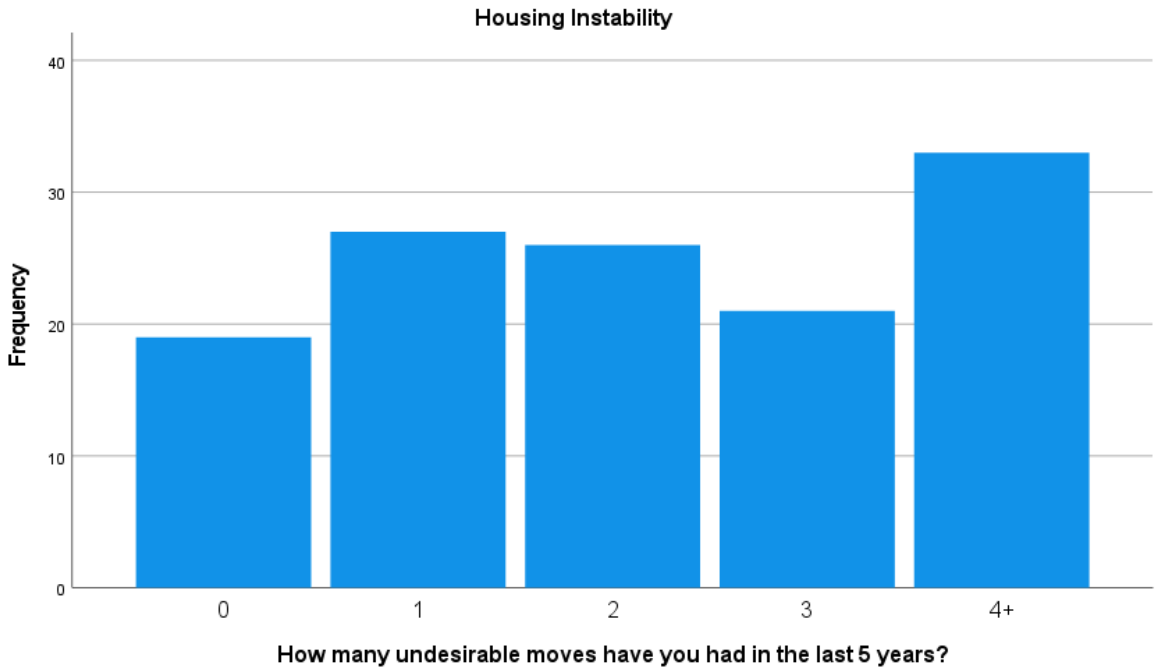
In the last year, have you had any mental health problems?		Frequency	Percent
Valid	Yes	97	80.2%
	No	24	19.8%
Missing		0	0%
Total		121	100%



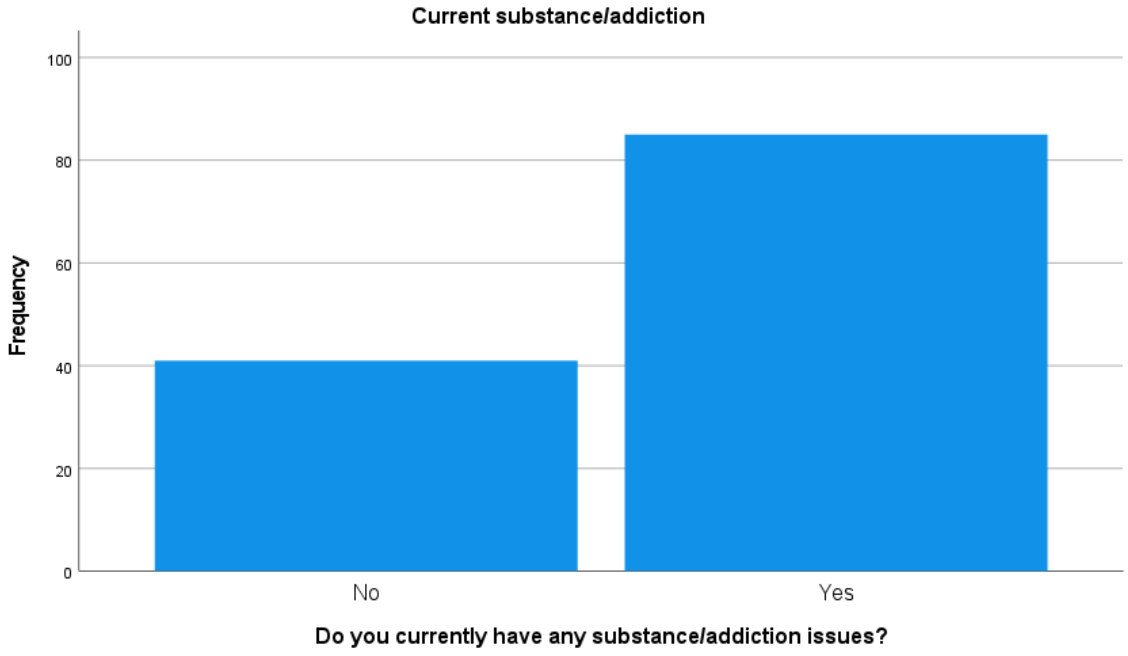
In the last year, have you had any physical health problems?		Frequency	Percent
Valid	Yes	75	62%
	No	46	38%
Missing		0	0%
Total		121	100%



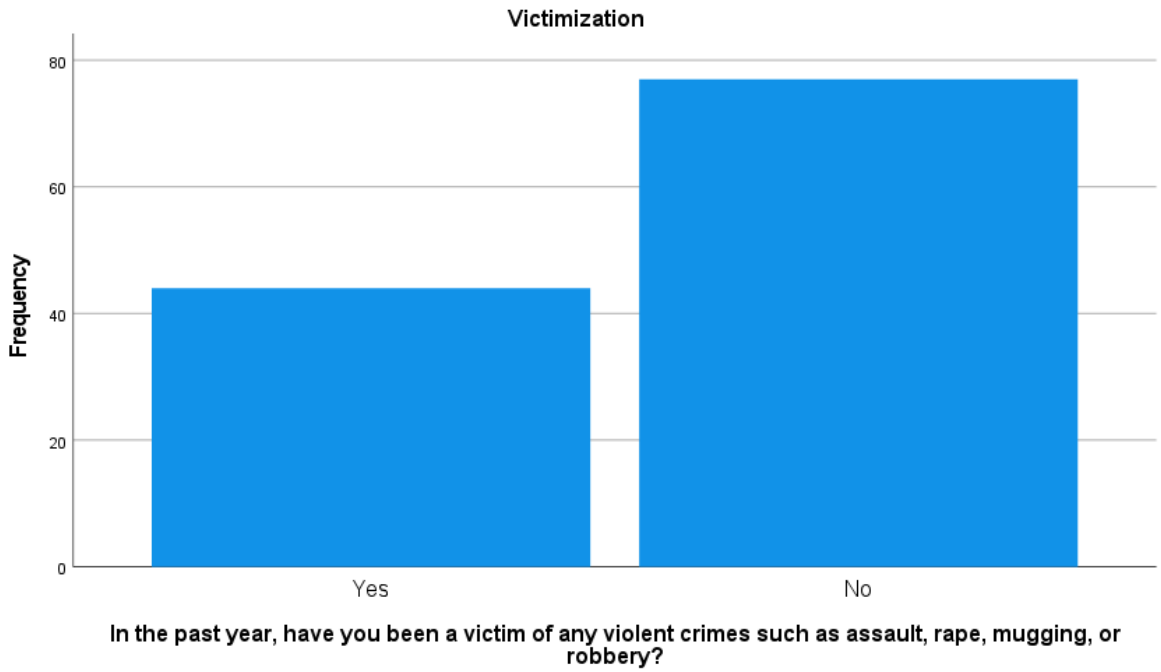
Housing Instability – number of undesirable moves in past 5 years		Frequency	Percent
Valid	0	18	14.9%
	1	27	22.3%
	2	24	19.8%
	3	21	17.4%
	4+	31	25.6%
Missing		0	0%
Total		121	100%



Current Substance Use/Addictions		Frequency	Percent
Valid	Yes	83	68.6%
	No	38	31.4%
Missing		0	0%
Total		121	100%



Victimization		Frequency	Percent
Valid	Yes	44	36.4%
	No	77	63.6%
Missing		0	0%
Total		121	100%



Appendix F- Dependent Variable: Frequencies and Bar Charts

Head Injury		**Frequency**	**Percent**
Valid	Yes	62	51.2%
	No	59	48.8%
Missing		0	0%
Total		121	100%

Appendix G- SPSS Data Output- Examining Relationships Between Head Injury and Independent Variables: Crosstabulation Tables, Chi-Square, Bar Charts

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * head injury	**121**	**100.0%**	**0**	**0.0%**	**121**	**100.0%**

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
Gender	**Man**	**Count**	31	40	71
		% within Gender	43.7%	56.3%	100.0%
		% within head injury	52.5%	64.5%	58.7%
		% of Total	25.6%	33.1%	58.7%
	Woman	**Count**	28	22	50
		% within Gender	56.0%	44.0%	100.0%
		% within head injury	47.5%	35.5%	41.3%

	% of Total	23.1%	18.2%	41.3%
Total	**Count**	59	62	121
	% within Gender	48.8%	51.2%	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

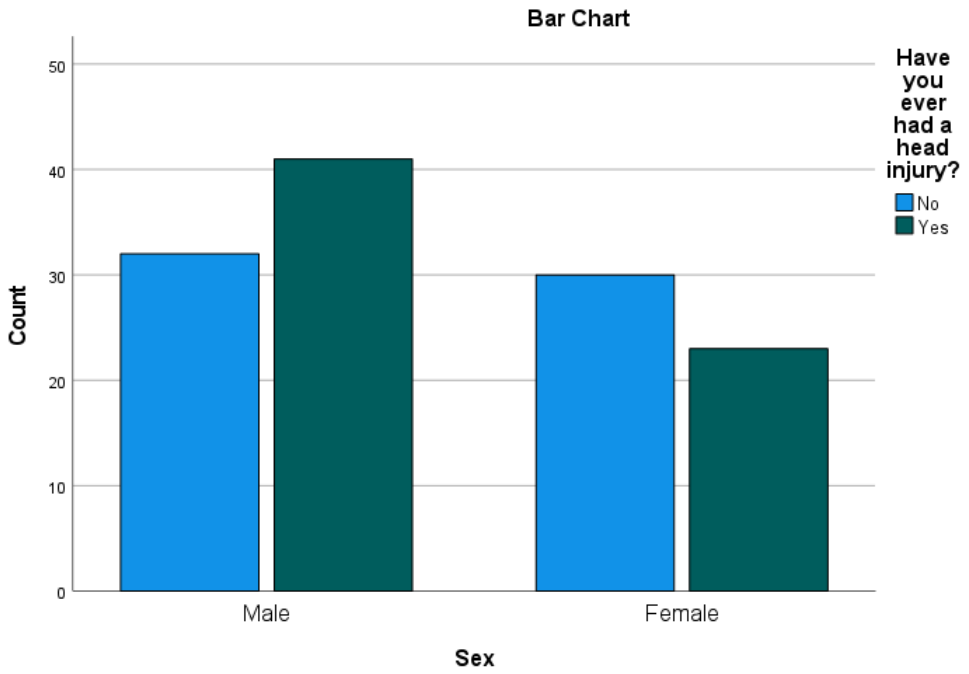
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	1.788[a]	1	.181		
Continuity Correction[b]	1.328	1	.249		
Likelihood Ratio	1.791	1	.181		
Fisher's Exact Test				.200	.125
Linear-by-Linear Association	1.773	1	.183		
N of Valid Cases	121				

0 cells (0.0%) have expected count less than 5. The minimum expected count is 24.38.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-.122	.181
	Cramer's V	.122	.181
	Contingency Coefficient	.121	.181
N of Valid Cases		121	



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Ethnic/racial group * head injury	**121**	**100.0%**	**0**	**0.0%**	**121**	**100.0%**

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
Ethnic/racial group	**European origins (Caucasian)**	**Count**	49	41	90
		% within Ethnic/racial group	54.4%	45.6%	100.0%
		% within head injury	83.1%	66.1%	74.4%
		% of Total	40.5%	33.9%	74.4%
	Aboriginal/Other	**Count**	10	21	31
		% within Ethnic/racial group	32.3%	67.7%	100.0%

	% within head injury	16.9%	33.9%	25.6%
	% of Total	8.3%	17.4%	25.6%
Total	**Count**	59	62	121
	% within Ethnic/racial group	48.8%	51.2%	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	4.543[a]	1	0.033		
Continuity Correction[b]	3.698	1	0.054		
Likelihood Ratio	4.627	1	0.031		
Fisher's Exact Test				.039	0.027
Linear-by-Linear Association	4.505	1	0.34		

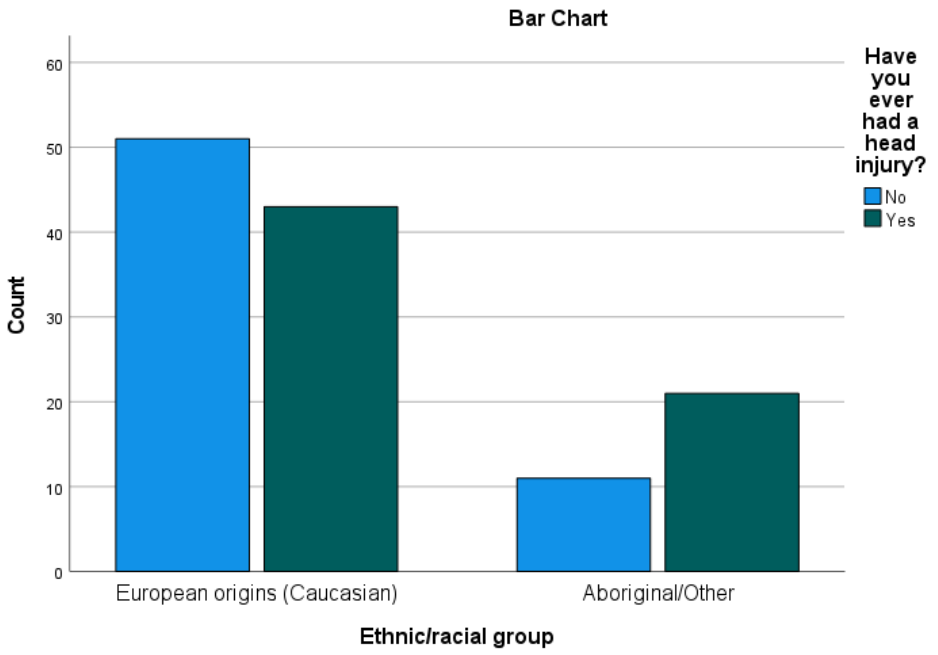
N of Valid Cases	121				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.12.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.194	.033
	Cramer's V	.194	.033
	Contingency Coefficient	.190	.033
N of Valid Cases		121	



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Highest Level of Education * head injury	**121**	**100.0%**	**0**	**0.0%**	**121**	**100.0%**

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
Highest Level of Education	**Grade School**	**Count**	13	21	34
		% within education	38.2%	61.8%	100.0%
		% within head injury	22.0%	33.9%	28.1%
		% of Total	10.7%	17.4%	28.1%
	High School	**Count**	23	24	47

		% within education	48.9%	51.1%	100.0%
		% within head injury	39.0%	38.7%	38.8%
		% of Total	19.0%	19.8%	38.8%
	Community College/ University	**Count**	23	17	40
		% within education	57.5%	42.5%	100.0%
		% within head injury	39.0%	27.4%	33.1%
		% of Total	19.0%	14.0%	33.1%
Total		**Count**	59	62	121
		% within education	48.8%	51.2%	100.0%
		% within head injury	100.0%	100.0%	100.0%
		% of Total	48.8%	51.2%	100.0%

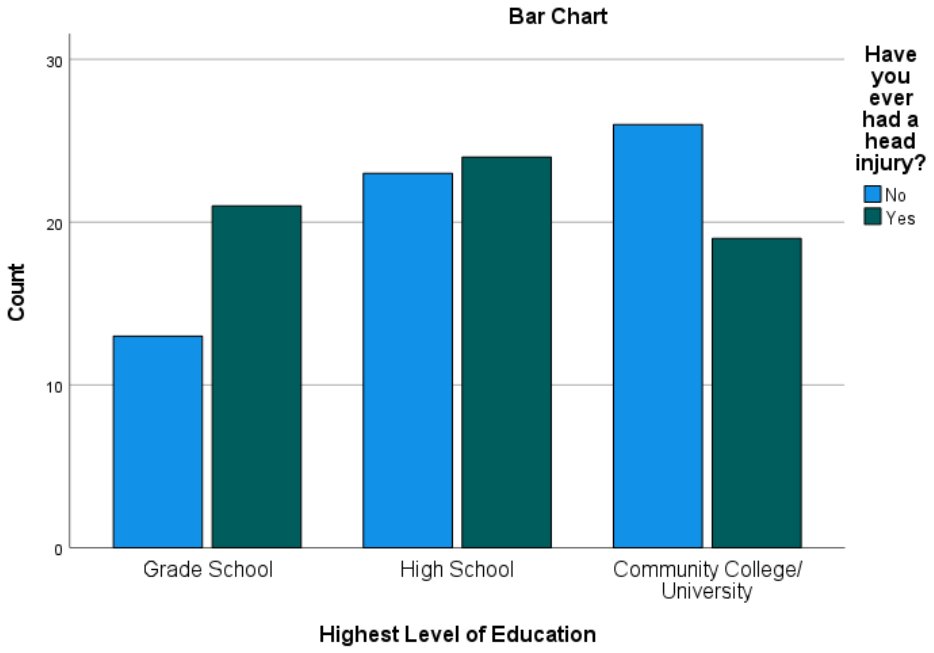
Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.731[a]	2	.255
Likelihood Ratio	2.750	2	.253
Linear-by-Linear Association	2.695	1	.101
N of Valid Cases	121		

0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.58.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.150	.255
	Cramer's V	.150	.255
	Contingency Coefficient	.149	.255
N of Valid Cases		121	



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
income * head injury	121	100.0%	0	0%	121	100.0%

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
How much money did you receive during the past month?	0-1169	Count	41	47	88
		% within income	46.6%	53.4%	100.0%
		% within head injury	69.5%	75.8%	72.7%
		% of Total	33.9%	38.8%	72.7%
	1170-3000	Count	18	15	33
		% within income	54.5%	45.5%	100.0%
		% within head injury	30.5%	24.2%	27.3%

	% of Total	14.9%	12.4%	27.3%
Total	**Count**	59	62	121
	% within income	48.8	51.2	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

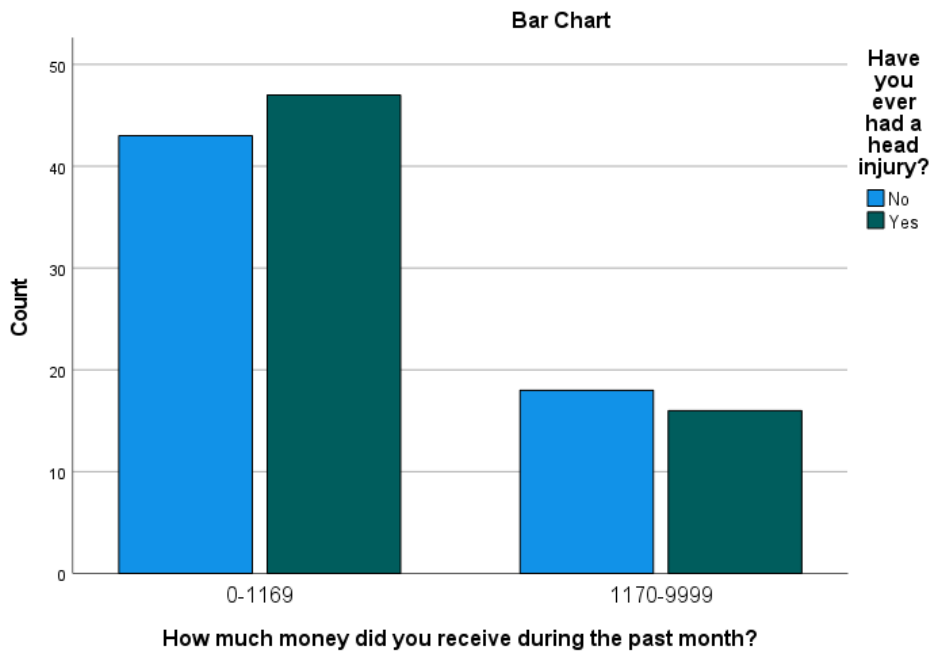
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	.608[a]	1	.436		
Continuity Correction[b]	.331	1	.565		
Likelihood Ratio	.608	1	.435		
Fisher's Exact Test				.541	.283
Linear-by-Linear Association	.603	1	.438		
N of Valid Cases	121				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.09.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-.071	.6436
	Cramer's V	.071	.436
	Contingency Coefficient	.071	.436
N of Valid Cases		121	



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
mental health problems * head injury	121	100.0%	0	0.0%	121	100.0%

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
In the last year, have you had any mental health problems?	No	Count	17	7	24
		% within mental health problems	70.8%	29.2%	100.0%
		% within head injury	28.8%	11.3%	19.8%
		% of Total	14.0%	5.8%	19.8%
	Yes	Count	42	55	97
		% within mental health problems	43.3%	56.7%	100.0%
		% within head injury	71.2%	88.7%	80.2%

	% of Total	34.7%	45.5%	80.2%
Total	**Count**	59	62	121
	% within mental health problems	48.8%	51.2%	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

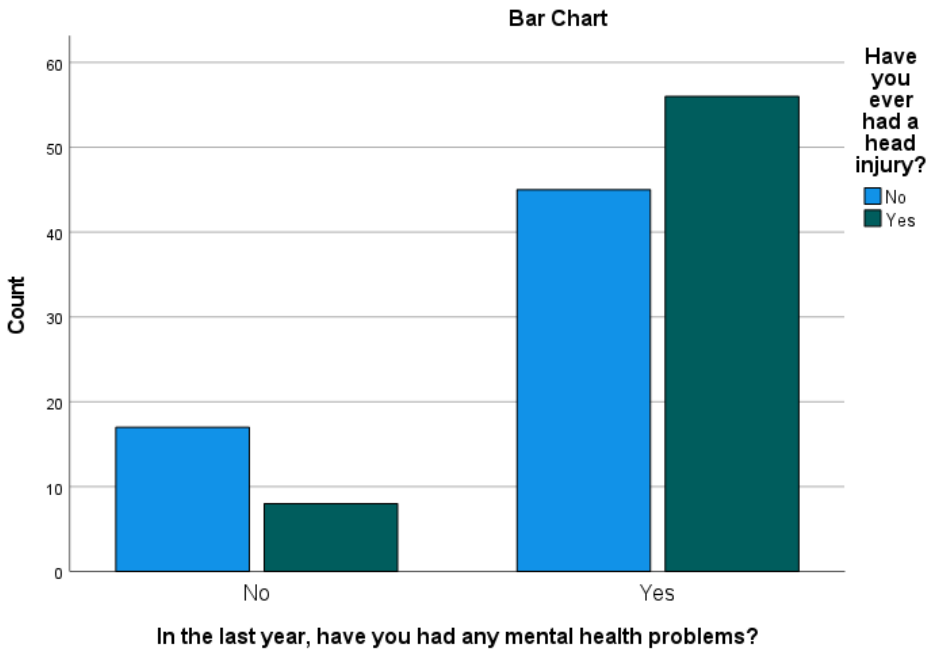
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	5.838[a]	1	.016		
Continuity Correction[b]	4.788	1	.029		
Likelihood Ratio	5.970	1	.015		
Fisher's Exact Test				.022	.014
Linear-by-Linear Association	5.790	1	.016		
N of Valid Cases	121				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.70.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.220	.016
	Cramer's V	.220	.016
	Contingency Coefficient	.215	.016
N of Valid Cases		121	



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
physical health problems * head injury	121	100.0%	0	0.0%	121	100.0%

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
In the last year, have you had any physical health problems?	No	Count	30	16	46
		% within physical health problems	65.2%	34.8%	100.0%
		% within head injury	50.8%	25.8%	38.0%
		% of Total	24.8%	13.2%	38.0%
	Yes	Count	29	46	75
		% within physical health problems	38.7%	61.3%	100.0%
		% within head injury	49.2%	74.2%	62.0%

	% of Total	24.0%	38.0%	62.0%
Total	**Count**	59	62	121
	% within physical health problems	48.8%	51.2%	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	8.045[a]	1	.005		
Continuity Correction[b]	7.017	1	.008		
Likelihood Ratio	8.142	1	.004		
Fisher's Exact Test				.005	.004

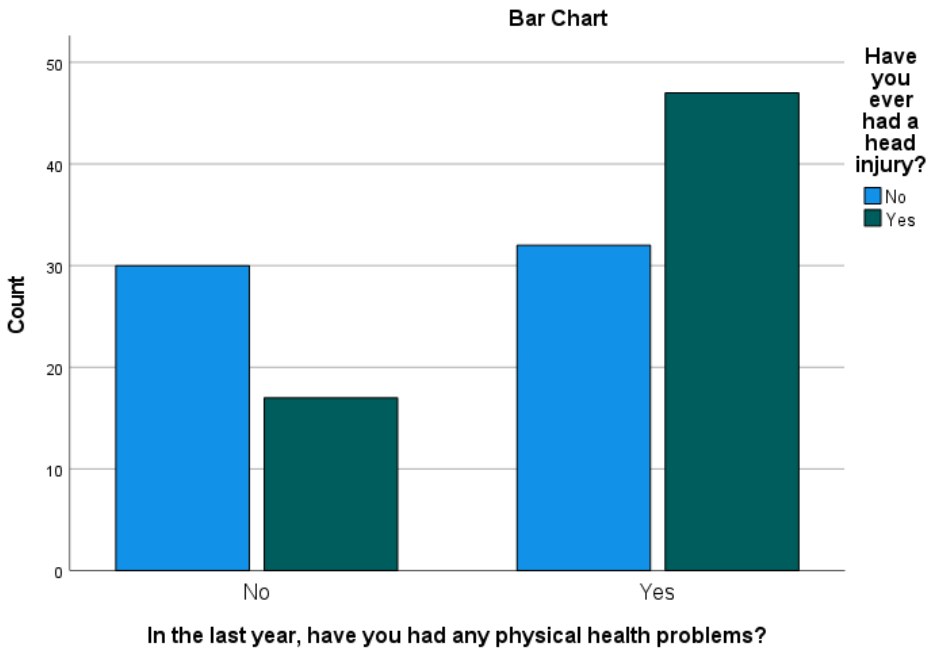
Linear-by-Linear Association	7.978	1	.005		
N of Valid Cases	121				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.43.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.258	.005
	Cramer's V	.258	.005
	Contingency Coefficient	.250	.005
N of Valid Cases		121	


Bar Chart
Have you ever had a head injury?
No
Yes
Count
50
40
30
20
10
0
No
Yes
In the last year, have you had any physical health problems?

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Housing instability * head injury	**126**	**100.0%**	**0**	**0.0%**	**126**	**100.0%**

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
How many undesirable moves have you had in the last 5 years?	**0**	**Count**	**9**	**9**	**18**
		% within housing instability	50.0%	50.0%	100.0%
		% within head injury	15.3%	14.5%	14.9%
		% of Total	7.4%	7.4%	14.9%
	1	**Count**	14	13	27
		% within housing instability	51.9%	48.1%	100.0%
		% within head injury	23.7%	21.0%	22.3%

		% of Total	11.6%	10.7%	223.3%
	2	**Count**	15	9	24
		% within housing instability	62.5%	37.5%	100.0%
		% within head injury	25.4%	14.5%	19.8%
		% of Total	12.4%	7.4%	19.8%
	3	**Count**	10	11	21
		% within housing instability	47.6%	52.4%	100.0%
		% within head injury	16.9%	17.7%	17.4%
		% of Total	8.3%	9.1%	17.4%
	4+	**Count**	11	20	31
		% within housing instability	35.5%	64.5%	100.0%
		% within head injury	18.6%	32.3%	25.6%
		% of Total	9.1%	16.5%	25.6%
Total		**Count**	59	62	121
		% within housing instability	48.8%	51.2%	100.0%
		% within head injury	100.0%	100.0%	100.0%

	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

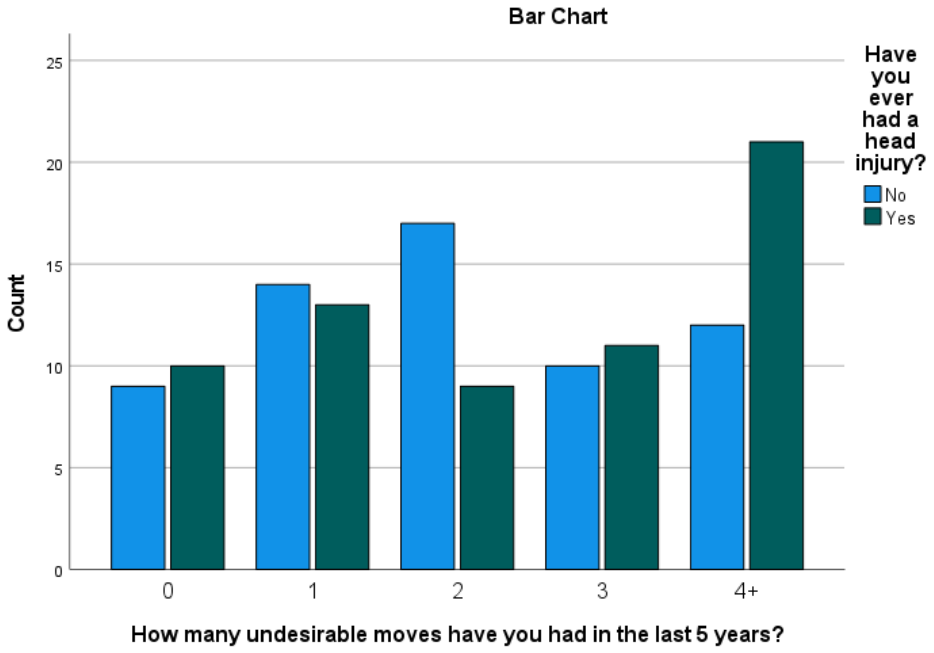
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	4.126[a]	4	.389
Likelihood Ratio	4.177	4	.383
Linear-by-Linear Association	1.568	1	.210
N of Valid Cases	121		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.78.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.185	.389
	Cramer's V	.185	.389
	Contingency Coefficient	.182	.389

N of Valid Cases	121



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Current substance/addiction issues? * head injury	**121**	**100.0%**	**0**	**0.0%**	**121**	**100.0%**

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
Do you currently have any substance/addiction issues?	**No**	**Count**	19	19	38
		% within current substance/addiction issues	50.0%	50.0%	100.0%
		% within head injury	32.2%	30.6%	31.4%
		% of Total	15.7%	15.7%	31.4%
	Yes	**Count**	40	43	83
		% within current substance/addiction issues	48.2%	51.8%	100.0%
		% within head injury	67.8%	69.4%	68.6%

	% of Total	33.1%	35.5%	68.6%
Total	**Count**	59	62	121
	% within current substance/addiction issues	48.8%	51.2%	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

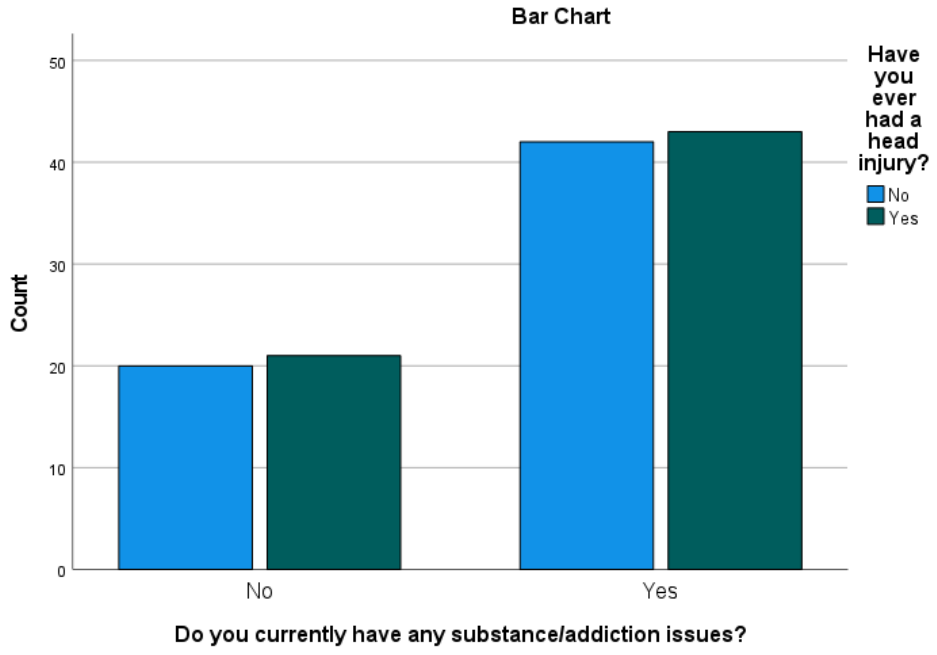
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	.034[a]	1	.854		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.034	1	.854		
Fisher's Exact Test				1.000	.504
Linear-by-Linear Association	.034	1	.854		
N of Valid Cases	121				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.53.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.017	.854
	Cramer's V	.017	.854
	Contingency Coefficient	.017	.854
N of Valid Cases		121	



Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
victimization * head injury	121	100.0%	0	0.0%	121	100.0%

Crosstab

			Have you ever had a head injury?		
			No	Yes	Total
Any violent crimes such as assault, rape, mugging, or robbery?	Yes	Count	10	34	44
		% within victimization	22.7%	77.3%	100.0%
		% within head injury	16.9%	54.8%	36.4%
		% of Total	8.3%	28.1%	36.4%
	No	Count	49	28	77
		% within victimization	63.6%	36.4%	100.0%
		% within head injury	83.1%	45.2%	63.6%

	% of Total	40.5%	23.1%	63.6%
Total	**Count**	59	62	121
	% within victimization	48.8%	51.2%	100.0%
	% within head injury	100.0%	100.0%	100.0%
	% of Total	48.8%	51.2%	100.0%

Chi-Square Tests

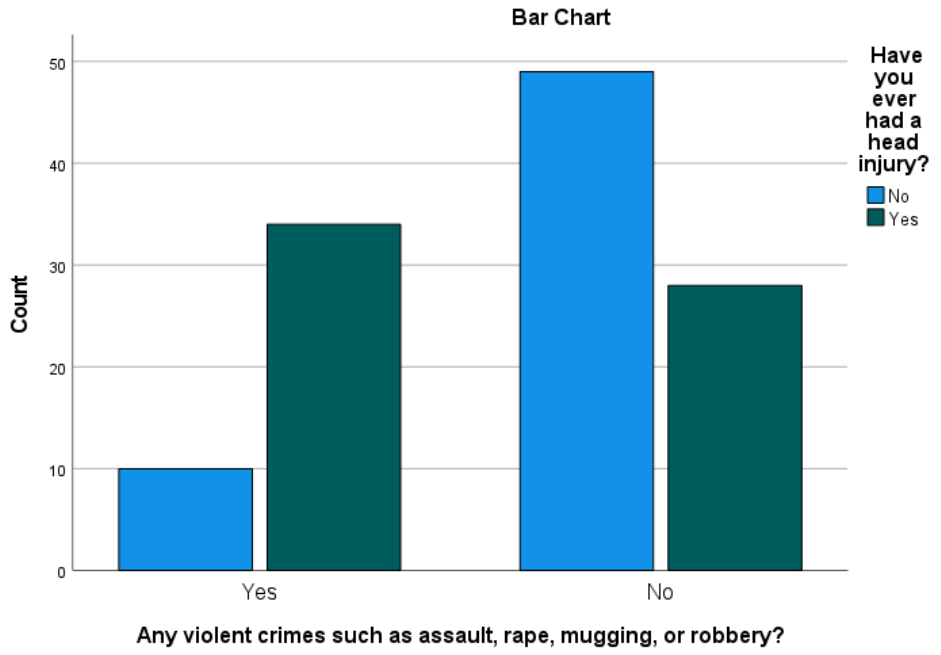
	Value	**df**	**Asymptotic Significance (2-sided)**
Pearson Chi-Square	18.755[a]	1	<.001
Likelihood Ratio	17.154	1	<.001
Linear-by-Linear Association	19.559	1	<.001
N of Valid Cases	121		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 21.45.

Symmetric Measures

	Value	Approximate Significance

Nominal by Nominal	Phi	-.394	<.001
	Cramer's V	.394	<.001
	Contingency Coefficient	.366	<.001
N of Valid Cases		121	



Appendix H- Kendall's Tau Correlations between all variables

			Gender	Highest Level of Education	Do you currently have any substance/addiction issues?
Kendall's tau_b	Gender	Correlation Coefficient	1.000	.152	-.011
		Sig. (2-tailed)	.	.078	.906
	Highest Level of Education	Correlation Coefficient	.152	1.000	-.048
		Sig. (2-tailed)	.078	.	.581
	Do you currently have any substance/addiction issues?	Correlation Coefficient	-.011	-.048	1.000
		Sig. (2-tailed)	.906	.581	.
	Have you ever had a head injury?	Correlation Coefficient	-.122	-.141	.017
		Sig. (2-tailed)	.183	.101	.854
	Ethnic/racial/cultural group	Correlation Coefficient	-.031	-.126	.112
		Sig. (2-tailed)	.733	.144	.222
	In the last year, have you had any mental health problems?	Correlation Coefficient	-.046	-.046	.155
		Sig. (2-tailed)	.618	.597	.090
	In the last year, have you had any physical health problems?	Correlation Coefficient	.173	.129	.057
		Sig. (2-tailed)	.058	.134	.532
	How much money did you receive during the past month from all of these sources?	Correlation Coefficient	.089	.187*	.015
		Sig. (2-tailed)	.329	.030	.873

Any violent crimes such as assault, rape, mugging, or robbery?	Correlation Coefficient	-.068	-.065	-.053
	Sig. (2-tailed)	.404	.399	.515
How many undesirable moves have you had in the last 5 years?	Correlation Coefficient	-.029	-.100	-.215*
	Sig. (2-tailed)	.755	.246	.018

			Ethnic/racial/cultural group	In the last year, have you had any mental health problems?	In the last year, have you had any physical health problems?
Kendall's tau_b	Gender	Correlation Coefficient	-.031	-.046	.173
		Sig. (2-tailed)	.733	.618	.058
	Highest Level of Education	Correlation Coefficient	-.126	-.046	.129
		Sig. (2-tailed)	.144	.597	.134
	Do you currently have any substance/addiction issues?	Correlation Coefficient	.112	.155	.057
		Sig. (2-tailed)	.222	.090	.532
	Have you ever had a head injury?	Correlation Coefficient	.194*	.220*	.258**
		Sig. (2-tailed)	.034	.016	.005
	Ethnic/racial/cultural group	Correlation Coefficient	1.000	.007	.109
		Sig. (2-tailed)	.	.938	.234
	In the last year, have you had any mental health problems?	Correlation Coefficient	.007	1.000	-.091
		Sig. (2-tailed)	.938	.	.321
	In the last year, have you had any physical health problems?	Correlation Coefficient	.109	-.091	1.000
		Sig. (2-tailed)	.234	.321	.
	How much money did you receive during the past month from all of these sources?	Correlation Coefficient	.066	-.114	.212*
		Sig. (2-tailed)	.472	.211	.020
	Any violent crimes such as assault, rape, mugging, or robbery?	Correlation Coefficient	-.099	.054	-.060
		Sig. (2-tailed)	.224	.510	.461
	How many undesirable moves have you had in the last 5 years?	Correlation Coefficient	-.107	-.031	-.132
		Sig. (2-tailed)	.240	.731	.148

			How much money did you receive during the past month from all of these sources?	Any violent crimes such as assault, rape, mugging, or robbery?	How many undesirable moves have you had in the last 5 years?
Kendall's tau_b	Gender	Correlation Coefficient	.089	-.068	-.029
		Sig. (2-tailed)	.329	.404	.755
	Highest Level of Education	Correlation Coefficient	.187*	-.065	-.100
		Sig. (2-tailed)	.030	.399	.246
	Do you currently have any substance/addiction issues?	Correlation Coefficient	.015	-.053	-.215*
		Sig. (2-tailed)	.873	.515	.018
	Have you ever had a head injury?	Correlation Coefficient	-.071	.103	-.394**
		Sig. (2-tailed)	.438	.209	.000
	Ethnic/racial group	Correlation Coefficient	.066	-.099	-.107
		Sig. (2-tailed)	.472	.224	.240
	In the last year, have you had any mental health problems?	Correlation Coefficient	-.114	.054	-.031
		Sig. (2-tailed)	.211	.510	.731
	In the last year, have you had any physical health problems?	Correlation Coefficient	.212*	-.060	-.132
		Sig. (2-tailed)	.020	.461	.148
	How much money did you receive during the past month from all of these sources?	Correlation Coefficient	1.000	-.056	.039
		Sig. (2-tailed)	.	.497	.673
	Any violent crimes such as assault, rape, mugging, or robbery?	Correlation Coefficient	-.056	1.000	-.195*
		Sig. (2-tailed)	.497	.	.017
	How many undesirable moves have you had in the last 5 years?	Correlation Coefficient	.039	-.195*	1.000
		Sig. (2-tailed)	.673	.017	.

			Have you ever had a head injury?
Kendall's tau_b	Gender	Correlation Coefficient	-.122
		Sig. (2-tailed)	.183
	Highest Level of Education	Correlation Coefficient	-.141
		Sig. (2-tailed)	.101
	Do you currently have any substance/addiction issues?	Correlation Coefficient	.017
		Sig. (2-tailed)	.854
	Have you ever had a head injury?	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
	Ethnic/racial/cultural group	Correlation Coefficient	.194*
		Sig. (2-tailed)	.034
	In the last year, have you had any mental health problems?	Correlation Coefficient	.220*
		Sig. (2-tailed)	.016
	In the last year, have you had any physical health problems?	Correlation Coefficient	.258**
		Sig. (2-tailed)	.005
	How much money did you receive during the past month from all of these sources?	Correlation Coefficient	-.071
		Sig. (2-tailed)	.438
	Any violent crimes such as assault, rape, mugging, or robbery?	Correlation Coefficient	.103
		Sig. (2-tailed)	.209
	How many undesirable moves have you had in the last 5 years?	Correlation Coefficient	-.394**
		Sig. (2-tailed)	.000

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix I- Binary Logistic Regression

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	121	100.0
	Missing Cases	0	.0
	Total	121	100.0
Unselected Cases		0	.0
Total		121	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
No	0
Yes	1

Categorical Variables Codings

			Parameter coding			
		Frequency	(1)	(2)	(3)	(4)
How many undesirable moves have you had in the last 5 years?	0	18	.000	.000	.000	.000
	1	27	1.000	.000	.000	.000
	2	24	.000	1.000	.000	.000
	3	21	.000	.000	1.000	.000
	4+	31	.000	.000	.000	1.000
Highest Level of Education	Grade School	34	.000	.000		
	High School	47	1.000	.000		
	Community College/ University	40	.000	1.000		
Ethnic/racial/cultural group	European origins (Caucasian)	90	.000			
	Aboriginal	31	1.000			
	No	24	.000			

In the last year, have you had any mental health problems?	Yes	97	1.000			
In the last year, have you had any physical health problems?	No	46	.000			
	Yes	75	1.000			
How much money did you receive during the past month from all of these sources?	0-733	88	.000			
	734-1169	33	1.000			
Any violent crimes such as assault, rape, mugging, or robbery?	No	77	.000			
	Yes	44	1.000			
Do you currently have any substance/addiction issues?	No	38	.000			
	Yes	83	1.000			
Gender	Man	71	.000			
	Woman	50	1.000			

Block 0: Beginning Block

Classification Table[a,b]

			Predicted		
			Have you ever had a head injury?		Percentage
	Observed		No	Yes	Correct
Step 0	Have you ever had a head injury?	No	0	59	.0
		Yes	0	62	100.0
	Overall Percentage				51.2

a. Constant is included in the model.
b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.050	.182	.074	1	.785	1.051

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	Do you currently have any substance/addiction issues? (1)	.034	1	.854
		Victimization	18.755	1	.000
		How many undesirable moves have you had in the last 5 years?	4.126	4	.389
		How many undesirable moves have you had in the last 5 years? (1)	.133	1	.715
		How many undesirable moves have you had in the last 5 years? (2)	2.262	1	.133
		How many undesirable moves have you had in the last 5 years? (3)	.013	1	.908
		How many undesirable moves have you had in the last 5 years? (4)	2.940	1	.086
	Overall Statistics		22.324	6	.001

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	23.894	6	<.001
	Block	23.894	6	<.001
	Model	23.894	7	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	143.773[a]	.179	.239

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.397	8	.494

Contingency Table for Hosmer and Lemeshow Test

		Have you ever had a head injury? = No		Have you ever had a head injury? = Yes		
		Observed	Expected	Observed	Expected	Total
Step 1	1	13	11.682	2	3.318	15
	2	6	7.003	4	2.997	10
	3	5	5.673	4	3.327	9
	4	9	9.816	7	6.184	16
	5	8	7.087	4	4.913	12
	6	7	6.281	5	5.719	12
	7	3	4.776	9	7.224	12
	8	6	3.138	8	10.862	14
	9	1	2.253	11	9.747	12
	10	1	1.290	8	7.710	9

Classification Table[a]

Observed			Predicted Have you ever had a head injury? No	Yes	Percentage Correct
Step 1	Have you ever had a head injury?	No	48	11	81.4
		Yes	26	36	58.1
	Overall Percentage				69.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Do you currently have any substance/addiction issues?(1)	-.422	.453	.865	1	.352	.656	.270	1.595
	Victimization	1.962	.478	16.840	1	.000	7.112	2.787	18.152
	How many undesirable moves have you had in the last 5 years?			3.497	4	.478			
	How many undesirable moves have you had in the last 5 years?(1)	-.482	.665	.526	1	.468	.617	.168	2.273
	How many undesirable moves have you had in the last 5 years?(2)	-1.102	.707	2.427	1	.119	.332	.083	1.329
	How many undesirable moves have you had in the last 5 years?(3)	-.167	.690	.059	1	.809	.846	.219	3.272

	How many undesirable moves have you had in the last 5 years?(4)	-.131	.674	.038	1	.846	.877	.234	3.289
	Constant	.055	.607	.008	1	.927	1.057		

a. Variable(s) entered on step 1: Do you currently have any substance/addiction issues?, victimization, How many undesirable moves have you had in the last 5 years?.

Block 2: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	31.172	7	<.001
	Block	31.172	7	<.001
	Model	55.066	13	<.001

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	112.601[a]	.366	.488

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.679	8	.221

Contingency Table for Hosmer and Lemeshow Test

		Have you ever had a head injury? = No		Have you ever had a head injury? = Yes		
		Observed	Expected	Observed	Expected	Total
Step 1	1	11	11.604	1	.396	12
	2	10	10.627	2	1.373	12
	3	11	9.208	1	2.792	12
	4	11	8.574	2	4.426	13
	5	4	6.378	8	5.622	12
	6	3	4.754	9	7.246	12
	7	6	3.602	6	8.398	12

	8	2	2.433	10	9.567	12
	9	1	1.437	11	10.563	12
	10	0	.384	12	11.616	12

Classification Table[a]

			Predicted		
			Have you ever had a head injury?		
	Observed		No	Yes	Percentage Correct
Step 1	Have you ever had a head injury?	No	45	14	76.3
		Yes	11	51	82.3
	Overall Percentage				79.3

a. The cut value is .500

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Gender (1)	-.996	.532	3.507	1	.061	.369	.130	1.048
	Highest Level of Education			6.477	2	.039			
	Highest Level of Education(1)	-.660	.608	1.178	1	.278	.517	.157	1.702
	Highest Level of Education(2)	-1.713	.683	6.294	1	.012	.180	.047	.688
	Ethnic/racial/cultural group(1)	.797	.556	2.051	1	.152	2.218	.745	6.602
	In the last year, have you had any mental health problems? (1)	2.034	.699	8.464	1	.004	7.644	1.942	30.087
	In the last year, have you had any physical health problems? (1)	1.733	.547	10.021	1	.002	5.656	1.935	16.534

How much money did you receive during the past month from all of these sources?(1)	-.483	.541	.798	1	.372	.617	.214	1.781
Do you currently have any substance/addiction issues?(1)	-1.115	.581	3.680	1	.055	.328	.105	1.024
Any violent crimes such as assault, rape, mugging, or robbery?(1)	2.571	.607	17.953	1	<.001	13.078	3.982	42.956
How many undesirable moves have you had in the last 5 years?			4.533	4	.339			
How many undesirable moves have you had in the last 5 years?(1)	-.578	.811	.507	1	.477	.561	.114	2.753
How many undesirable moves have you had in the last 5 years?(2)	-1.493	.842	3.140	1	.076	.225	.043	1.171
How many undesirable moves have you had in the last 5 years?(3)	-.083	.812	.011	1	.918	.920	.187	4.516
How many undesirable moves have you had in the last 5 years?(4)	-.320	.814	.155	1	.694	.726	.147	3.579
Constant	-1.140	1.046	1.189	1	.276	.320		

Variable(s) entered on step 1: Do you currently have any substance/addiction issues?, Any violent crimes such as assault, rape, mugging, or robbery?, How many undesirable moves have you had in the last 5 years?.

Casewise List[b]

Case	Selected Status[a]	Observed 16. Have you ever had a head injury?	Predicted	Predicted Group	Temporary Variable Resid	ZResid	SResid
26	S	N**	.865	Y	-.865	-2.533	-2.102
54	S	N**	.831	Y	-.831	-2.217	-2.006
58	S	Y**	.072	N	.928	3.592	2.385
99	S	Y**	.024	N	.976	6.408	2.780

a. S = Selected, U = Unselected cases, and ** = Misclassified cases.

b. Cases with studentized residuals greater than 2.000 are listed.

Curriculum Vitae

Name:	Emily Angus
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Honours and Awards:	Miriam Pritchard Award- 2013 University of Windsor Women's Aux. Burs. in Nursing- 2013 President's Honour Roll-2010-2012 Dean’s List-2012-2014
Conferences	Parkwood Institute Research Day 2022
Related Work Experience	Graduate Research Assistant Western University/ Mental Health Nursing Research Alliance 2019-Present Clinical Nurse Educator London Health Sciences Centre 2021-Present Registered Nurse London Health Sciences Centre 2014-2021