THE DIFFERENCES BETWEEN VIOLENTLY AND NONVIOLENTLY INJURED TRAUMA PATIENTS AND THE FACTORS AMONG VIOLENTLY INJURED TRAUMA PATIENTS FOLLOWING A BRIEF ALCOHOL COUNSELING INTERVENTION

by

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ABSTRACT

LEIGH ZICK DONGRE. The differences between violently and nonviolently injured trauma patients and the factors among violently injured trauma patients following a brief alcohol counseling intervention. (Under the direction of Dr. SUSAN FURR)

Alcohol use is well documented as a public health issue and a significant contributor to violent injury (Lam & Chim, 2010; World Health Organization, 2006). The purpose of this research was to examine the difference between violently and nonviolently injured trauma patients, namely the difference in AUDIT item responses, the change in risky drinking from the initial intervention to the 6-month follow up, and other factors, including resistance, quality of life, urine drug screen, insurance status, age and race. The AUDIT (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) instrument was used to assess risky drinking and the change in risky drinking. The other variables were obtained from patient self-report and patient records. This study employed a retrospective analysis of data from a clinical randomized trial entitled the *Teachable Moment*. A total of 333 participants were included for the analysis between the violently injured and nonviolently injured to examine the differences between the violently injured and nonviolently injured trauma patients. There was no difference indicated in the initial individual AUDIT item responses between the groups. However, a reduction in risky drinking was found for both groups. Likewise, a reduction in each individual AUDIT item response was found for both groups. Analysis also did not indicate a difference in the factors of age, urine drug screen, quality of life or resistance between the two groups. A difference in race and insurance status was found with 28% of the violently injured patients without insurance and 48% of the nonwhite patients with violently injury.

For the second part of the study, the data of 73 participants who were violently injured were included. The differences among only the violently injured patients, such as factors of resistance, urine drug screen, type of violently injury, race, age and risky drinking at the initial brief counseling intervention and the change in risky drinking between the initial a six month follow up, were also studied. A simultaneous linear regression was intended to examine the differences in the factors and risky drinking and the change in risky drinking. However, a Pearson Bivariate correlation found that the variables were not related, and therefore a regression analysis could not be employed. The lack of significance highlights the need for future research to continue to investigate factors associated with risky drinking of violently injured patients and the brief alcohol counseling interventions provided.

DEDICATION

I dedicate this milestone to the strong women of my family. Momma Dot, Momma, Aunt Susan, Katie, Sarah, Grandma and Aunt Kathy. For you I am eternally grateful. I love you.

"There are ties between us.
All men and women living on the Earth, ties of hope and love, sister and brotherhood."
~James Taylor

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with the world. I look forward to watching you grow. Sophie and Sukhi, thank you for snuggling with me on those late writing nights. I love you all.

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CHAPTER I: INTRODUCTION

Violent injury is a prevalent feature of modern life. It negatively impacts people of all ages, genders, races, ethnicities, religions, nationalities, and socioeconomic classes (Riley et al., 2015). Violent injury is defined as, "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in injury, death, psychological harm, maldevelopment or deprivation" (World Health Organization [WHO], 2002, p.5*)* and is the leading cause of death for people aged 15-44 (WHO, 2011). Annually, over a million people die because of violent injury, and many more are inflicted with violent injury worldwide. A nonfatal violent injury alone is devastating to individuals, families, and communities. Survivors of violent injury may experience a host of health consequences such as posttraumatic stress disorder, depression, or engagement in risky behavior such as drug and alcohol use (WHO, 2010). Also, an immense amount of psychosocial and financial burden is laid on communities and the healthcare system because of the high medical cost that occur in trauma units. The effort to mitigate the risk of violent injury is a hallmark of civil society, invariably being followed by the question, how could this have been prevented?

Worldwide, alcohol use is well-documented as a public health issue and a significant contributor to violent injury (Lam & Chim, 2010; WHO, 2006). Specifically, risky drinking has been strongly correlated with violent injury. Risky drinking has been defined as alcohol misuse or problematic drinking. It is when an individual consumes more than low risk limits of alcohol while not being diagnosed with alcohol abuse or

dependency, yet the person still experiences negative consequences. The National Institute on Alcohol Abuse and Alcoholism (NIAAA) claims that the number of risky drinkers may well exceed the number of severe risk drinkers defined as those suffering with alcoholism (NIAAA, 2010). The correlation between alcohol misuse and violent injury is particularly striking. Over half the patients admitted with a violent injury have consumed alcohol during the incident. For instance, roughly 42% of violent crimes involved alcohol with 51% of crime victims reporting that their victimizers had been drinking (Pernanen, 1991). Cornwell et al. (1998) reported that 67% of the patients admitted to a level I trauma center had consumed alcohol prior to a stab wound and 47% prior to a gunshot wound. Cherpitel (1993) found that those injured by violence were more likely to have consumed alcohol an hour before injury with 35% indicating they consumed more than seven drinks, and nearly half of the violently injured participants reported feeling drunk. Moreover, a strong relationship between intimate partner violence and alcohol exists. In a survey conducted in 2001 with partners of spouses with alcohol problems, 23% of African American partners, 11% of Whites partners, and 17% of Hispanic partners experienced intimate partner violence (Caetano, Cunradi, Schafer, & Clark, 2001). These authors also reported that 27% to 41% of the study participants consumed alcohol during an episode in which the partner was violent. An obvious link between violent injury and alcohol use exists. It is believed that strategies, systems, and interventions may deter or reduce violent injury by means of addressing risky drinking behaviors. To date, there is limited exploratory research on intervening with violently injured patients in the hospital setting, but results are promising.

Violent injury is considered a type of traumatic injury. There are two types of traumatic injuries. They are commonly distinguished by "intentionality". The two kinds of injury are those that are intentional and those that are unintentional. Intentional injury is a type of traumatic injury in which an individual is violently injured either by self or another. These causes are categorized as interpersonal violence (e.g., homicide, sexual assault, neglect and abandonment, and other maltreatment), suicide, and collective violence such as war (WHO, 2016). Unintentional injuries are generally those that are accidental in nature, such as motor vehicle accident, fall, burn or drowning (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014a). For the purposes of this paper, intentional has been labelled as violent and unintentional has been labelled as nonviolent.

For both types of injuries, millions of individuals are admitted to emergency departments each year. One in 10 Americans yearly are admitted to an emergency department for a traumatic injury resulting from either an accident or violence (Center for Disease Control [CDC], 2012). Traumatic injury, as opposed to illness, accounts for the five leading causes of death and includes approximately 80% of the deaths nationally. The five leading causes of injury deaths are motor vehicle traffic crashes, poisoning, falls, suicide, and homicide (CDC, 2012).

Findings from The Center for Disease Control and Prevention (2014) indicate that alcohol is the number one leading risk factor for both types of traumatic injury. Nearly 40% of patients in emergency departments were admitted to trauma centers due to trauma related injuries; approximately 40 to 50% of those individuals were intoxicated

(Soderstrom et al., 1997). Likewise, 40-50% of motor vehicle accidents occur when alcohol was consumed (D'Onofrio & Degutis, 2002). Without an intervention, alcohol misuse and abuse can become alcohol dependence and leave individuals more vulnerable to injury or even death (Dischinger, Mitchell, Kufera, Soderstrom, & Lowenfels, 2001). Moreover, injury recidivism is twice as likely in those patients who misuse alcohol than those that do not consume alcohol (Dischinger et al., 2001; Worrell et al., 2006).

Risky drinking behaviors may be impacted by various risk or protective factors, also referred to as determinants. Risk factors are conditions that can lead to negative outcomes; for the purposes of this study, risky drinking is the behavior to be examined in violently injured patients. However, protective factors may lead to more positive outcomes and lessen negative consequences. When seeking understanding for the national concern of alcohol-related violent injury, many factors may play a role in risky drinking and the decision to change risky drinking habits. The factors that will be discussed and analyzed are: resistance, drug use, insurance status, type of violent injury, age, race, and quality of life.

One potential risk factor associated with risky drinking is resistance. Resistance is considered a significant barrier toward changing negative drinking behaviors (Miller & Rollnick, 2002; Project MATCH Research Group, 1997). It is considered the patient's low level of willingness to actively participate in a counseling session. It may also be conceived of as a reaction to confrontation in therapy. The term was coined in the context of the counseling method called Motivational Interviewing (MI) (Miller & Rollnick, 2002) and stands in opposition to the MI concept of "change talk." According to Miller and Rollnick, resistance is a normal behavior observed within the change process.

Resistance is considered common among those struggling with alcohol misuse (Chamberlain, Pattersonk, Reid, Kavanaugh, & Forgatch,1984; Miller, Benefield, & Tonigan,, 1993). It is important to mention that the creators of MI, conceive of resistance in terms of "level of engagement" (Miller & Rollnick, 2002). In essence, it is related to the willingness to make change in behaviors, in this case, drinking behaviors. Research has indicated that this engagement can influence outcomes (Miller et al., 1993). As such, resistance is an important variable to understand when providing brief counseling interventions to violently injured risky drinkers. In addition to the commonality of observed resistance in individuals with alcohol misuse, the level of resistance may also impede trauma patients' ability to change risky drinking habits. Additionally, understanding resistance more fully may offer future counseling interventionists an improved means to support patients in Level I trauma center.

Likewise, lack of insurance can be considered a risk factor for violently injured risky drinkers. Thirty-three million Americans are uninsured, of those the majority are young, racial and ethnic minorities, and people living in poverty (US Census Bureau, 2015). The uninsured group also has more physical and mental health concerns (Hahn & Flood, 1995; Short & Lair, 1994). Stockdale, Tang, Zhang, Belin, & Wells (2007) found that more vulnerable populations, such as the uninsured, racial and ethnic minorities, low socioeconomic status, and older adults, are significantly less likely to use services for alcohol and mental health concerns. Two studies found that that the uninsured are also less likely to receive specialized mental health care (Katz, Kessler, Frank, Leaf, & Lin, 1997;

Wells, Sherbourne, Sturm, Young, & Burnam, 2002). However, studies have not differentiated between mental health and substance abuse treatment; therefore, it is not definitively known how substance abuse, more specifically alcohol abuse and misuse, is influenced by insurance status. As such, this population may stand at a higher risk for untreated alcohol misuse and alcohol use disorders (Norquist & Wells, 1991; Wells et. al., 2002). Moreover, many injured patients admitted to trauma centers are uninsured, underinsured or receive Medicaid or Medicare (Marshall & Orlando, 2002; Smith et al., 1992). In fact, a recent study found that uninsured injured trauma patients are more likely to be transferred to a trauma center than insured patients. However, despite the high rates of alcohol-related trauma admission of patients without insurance, there is a lack of studies on health insurance status with regard to risky alcohol-related violent injury. The study sought to examine if insurance status can predict risky drinking use in violently injured trauma patients.

Also, drug use is an important risk factor to consider with the violently-injured population. The combined use of drugs and alcohol increases the risk of injury (Cherpitel, Watters, Brubacher, & Stenstrom, 2012; Demetriades et al., 2004). Draus, Santos, Franklin, & Foley (2008) used trauma registry data to identify adolescent patients admitted to a trauma center with substance-related blunt trauma. They determined that the majority of adolescents admitted tested positive on a toxicology screening which included both alcohol and drugs. Those who tested positive were more critically injured, had lengthier hospital stays, and had more negative health outcomes than those with negative toxicology screenings. The authors of this study concluded that toxicology screenings helped detect substance use and identify those at risk for recurring injury. As

it applies to this study, it is important to know if drug use is a factor of risky drinking specifically among violently injured populations.

Similarly, the type of violent injury may also be a risk factor associated with risky drinking. Only a few studies have examined the differences in type of violent injury as related to alcohol use. In 2004, researchers examined the trauma deaths documented in a level I trauma center's trauma registry. The study was designed to analyze the connection between substance use, on the one hand, and injury severity, injury location and spinal injury, and death, on the other. The results indicated a higher percentage of patients with penetrating trauma injuries who screened positive for substance use and alcohol use died upon arrival to the hospital (68.8%versus 48.8%, $p = 0.05$). Additionally, the study found that penetrating trauma (gunshot and stab wounds) was significantly more likely (53.0 %) with a positive blood alcohol level, as compared to blunt trauma (fall, motor vehicle accident, assault, etc.) (31%, $p = 0.001$) (Demetriades et al., 2004). While this finding points to a strong association between alcohol and violent injury, no study to date has examined the type of violent injury and alcohol consumption alone. Thus the mechanism of violent injury as it relates to risky drinking is not fully understood and demands further investigation.

Variables such as race and age may serve as demographic risk factors as well. As the United States becomes increasingly more diverse, examining the group disparities associated with alcohol use becomes more relevant. The negative consequences associated with risky drinking do not discriminate among groups of people. However, risky drinking has been shown to affect people of various races differently. For instance, African Americans consume less alcohol less often than whites, but they experience more

negative effects, such as traumatic injury; (Caetano et al., 2001; Jones-Webb, Hsiao, Hannan, & Caetano, 1995; Mulia, Ye, Zemore, & Greenfield, 2009). Whites and Native Americans, however, have the highest rates of DUI as a consequence of drinking behaviors (SAMHSA, 2007). It is important to consider race when investigating risky drinking in violently injured patients receiving counseling intervention at the bedside because it may help the medical staff provide higher quality of care, such as referring to counselors if specific patients are more at risk.

It is equally as important to consider how age impacts risky drinking behaviors. For instance, youth are more at risk for an alcohol-related injury than other age groups. Each day in the United States, 16 youths between the ages of 10 to 24 are murdered; 84% of these fatalities involve a firearm, and homicide is the second leading cause of death for young people (CDC, 2010). Nearly half of youth who die annually from trauma die from violence-related injuries. Medical treatment is provided yearly to approximately one million violently injured youth ages 15 to 24 (CDC, 2010). Therefore, it seems important to consider how age, particularly that of younger individuals, may impact risky drinking behaviors in order to learn how to provide appropriate intervention measures.

Protective factors can support change in risky drinking habits. Quality of life is a protective factor worth considering because risky drinking can negatively impact aspects of an individual's life. Quality of life (QoL) is considered an individual's subjective view of personal well-being which may include, but is not limited to, mental and physical health. The concept of quality of life (QoL) is known within research as a meaningful measurement for treatment outcomes (Wong et al., 2005). Within the social sciences, QoL is deemed the perception of one's goodness of life (Zubaran & Foresti, 2009).

According to Zubaran and Foresti (2009), quality of life (QoL) is considered a significant clinical and research outcome specifically in the study of substance use. For the purposes of this study, the differences in QoL among violently and nonviolently injured patient will be assessed.

It is evident that these factors may influence risky drinking. In an effort to better understand this population and provide high quality care, prevent, or intervene appropriately, it is worth considering the risk factors or protective factors that may play a role in risky drinking behaviors and in turn lead to violent injury. In short, an examination of these factors may significantly impact individuals and society.

Significance of the Study

The above statistics communicate the urgent need to address the issue of alcohol-related violent injury. Risky drinking is acknowledged as a key contributor of violent injury (Cherpitel, Martin, Macdonald, Brubacher, & Stenstrom, 2013; Cunningham et al., 2009). Several factors influence risky drinking behaviors and the consequences. Thus, examining these factors may assist in the reduction of alcohol misuse, thereby combating this national epidemic. First, it is important to establish any differences between those that are violently and nonviolently injured. No studies to date have focused on the difference in nonviolent and violent injury and the change in risky drinking associated with a brief counseling intervention at the hospital bedside. Second, the AUDIT (Alcohol Use Disorder Test), an assessment developed by the World Health Organization to screen for harmful drinking habits specifically useful in the medical setting (Reinert & Allen, 2002; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993), was used to compare the differences in item responses between patients with alcohol-related violent and

nonviolent injuries. Although significant studies have examined screening and brief intervention with the AUDIT, research has not been conducted on the relationship of the AUDIT item responses between violently injured and nonviolently injured patients. Third, no study has examined the difference in resistance, quality of life, insurance status, urine drug screen, type of injury, race and age between these two groups. Likewise, researchers have not explored to what extent the aforementioned factors, excluding quality of life, predict risky drinking at the initial counseling intervention and the change in risky drinking of violently injured patients over time. The aim of this study was to understand these differences and predictors in an effort to provide effective counseling to violently-injured risky drinkers.

Purpose of the Study

The purpose of this study was to identify the differences between violently and nonviolently injured patients seen in a level one trauma center following a brief intervention as related to the following factors: the AUDIT item responses, the change in risky drinking behaviors, resistance, quality of life, insurance status, urine drug screen, race and age. The study also examined resistance, insurance status, urine drug screen, type of injury, race and age as predictors of risky drinking during the initial screening, brief intervention, and referral to treatment (SBIRT) and change in risky drinking conducted with violently injured patients at a level I trauma center.

Research Questions

The research questions for this study are as follows:

1) What is the difference in the initial AUDIT item responses between violently injured patients and nonviolently injured patients?

2) What is the difference in violently injured patients' and nonviolently injured patients' change in risky drinking from the initial intervention to the 6-month follow up?

3) What is the difference in counselors' evaluation of resistance, quality of life at the 6-month follow up, insurance status, urine drug screen, race and age between violently injured and nonviolently injured patients?

4) To what extent do counselors' evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age of violently injured patients predict risky drinking at the initial intervention?

5) To what extent do counselor evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age of violently injured patients predict change in risky drinking from the initial intervention to the 6-month follow up?

Operationalized Definitions

The following are the operational definitions for this research study:

A *trauma patient* is operationally defined as a patient who is admitted to an inpatient hospital trauma service within a Level I medical trauma center.

Blood alcohol level is operationally defined as the percentage of alcohol in the blood in units of mass of alcohol per volume of blood. The patient's blood alcohol level is obtained when they are admitted to the hospital. It is typically measured as mass per volume. A blood alcohol level of less than .01 or less indicates no presence of alcohol.

Positive Urine Drug Screen is operationally defined as a trauma patient's urine sample taken by hospital staff for drug testing. If a patient's urine drug screen is positive, they have drugs present in their bodies. The drugs tests are as follows: benzodiazepines, barbiturates, cocaine, amphetamines, opiates, and tetrahydrocannabinol.

Quality of Life is operationally defined as the self-report of life satisfaction by the patient.

Race is operationally defined as the self-report of White, African-American, Latino, and American Indian by the patient.

Resistance is operationally defined as the counselor's self-reported assessment of the patient's resistance to change during the counseling brief intervention.

Risky Drinking is operationally defined as the patient's AUDIT scores assessed by the counselor during the initial and six month follow up. The *AUDIT* is the Alcohol Use Disorder Identification Test. It is the primary screening tool utilized to assess the level of risky drinking of patients. It consists of 10 questions and is used in the screening, brief intervention, and referral to treatment (SBIRT).

Screening, brief intervention, referral to treatment (SBIRT) is operationally defined as a practice used to "identify, reduce, and prevent problematic use, abuse, and dependence on alcohol and illicit drugs" (SAMSHA, 2013).

Type of violent injury is operationally defined as mechanism of violent injury: stabbing, gunshot, or assault. For the purposes of this research study, type of injury was determined by the variable reason for hospitalization in The *Teachable Moment* archival dataset.

Research Design

This research is a correlational and regression study. A t-test examined the difference in AUDIT items responses between the two groups. An ANOVA was employed to examine the change in risky drinking between violently injured patients and nonviolently injured patient. A t-test for the continuous variables and chi square test for the categorical variables was also used to examine the differences in resistance, quality of life, insurance status, urine drug screen, type of violent injury, race and age between the

two groups. A simultaneous linear regression analysis was utilized to examine the predictive factors of resistance, insurance status, drug use, type of violent injury, race and age of risky drinking and change in risky drinking of violently injured patients.

Assumptions

The following assumptions have been identified:

1) The archival dataset is free of errors.

2) The participants answered all the AUDIT questions truthfully.

3) The AUDIT is valid and reliable.

4) The counselors were adequately trained in screening, brief intervention, and referral to treatment (SBIRT).

Delimitations

The following delimitations have been identified:

1) The researcher is conducting a retrospective study utilizing archival dataset.

2) The population is limited to those patients who were eligible at one trauma center in the Southeastern U.S.

Limitations

The following limitations have been identified:

1) The results have limited generalizability; therefore they may not represent all violently injured patients in all trauma centers nationwide.

2) The study included English and Spanish speaking participants only.

3) The assessment of risky drinking was self-reported by the study participants and was limited due to potential reporter bias.

Threats to Validity

The following threats to internal and external validity have been identified:

Internal validity:

1) Internal validity is defined as the extent to which the results can be accurately interpreted (Tabachnick & Fidell, 2007). Instrumentation has the potential to influence internal validity. Reporter bias can influence internal validity. While research indicates that reporter bias is limited with the AUDIT (Babor et al., 2001), social desirability could influence the participants self-report of risky drinking, thus influencing the study results. Another threat to internal validity is social desirability. While insurance status, race and age are self-reported, they are objective in nature and not subject to social desirability. Also, quality of life is self-reported by patients and also influenced by social desirability.

External validity:

2) External validity is defined as the extent to which a study's results can be generalized to a larger population (Tabachnick & Fidell, 2007). This study is limited because the results were based on only participants from one trauma center in the southeast.

Summary

Chapter I offered an introduction to the national problem of risky drinking and violent injury. Factors associated with risky drinking, namely resistance, quality of life, insurance status urine drug screen, type of injury race, and age as well as the AUDIT were discussed. An overview of the study includes an introduction to the problem, purpose, the significance of the study, the research questions, operationalized definitions, research design, assumptions, the delimitations, limitations, assumptions, and threats.

CHAPTER II: LITERATURE REVIEW

Steven Pinker (2011) cited Abraham Lincoln's famous phrase, "the better angels of our nature" when he wrote of our human disposition towards peace and collaboration juxtaposed against our inclination toward violence and chaos. Pinker draws a connection between alcohol consumption and our tendency towards violence throughout human existence. Today, the World Health Organization (2010) estimates 5.8 million deaths due to injury annually—that is approximately 10% of the deaths worldwide. One third of traumatic injuries are violence related and the most common factor is alcohol (WHO, 2011)**.** Numerous studies have confirmed the link between violence and alcohol. Individuals under the influence of alcohol are more likely to be involved in a violent act, either as victim or victimizer (Bushman, 1997; Bushman & Cooper, 1990). Intoxication of one or more individuals is found in 66% of domestic violence cases, 33% of violence acts with strangers, and 58% of suicides (Nayduch, 2009).

Recently, neuroscientists have found that alcohol interferes with synaptic transmission within the prefrontal cortex, the area of the brain associated with self-control (Abernanthy, Chandler, & Woodward, 2010; Feil et al., 2010). It is well established that the inebriated individual is thus less inhibited and can tend toward violent acts. The cost to society is profound. The economic costs of alcohol-related violence are estimated to be 46.8 billion to 425 billion annually (WHO, 2006). The psychosocial costs are also great, such as social problems associated with witnessing violence, heavy drinking, posttraumatic stress disorder, physical injury, depression, suicide and general

anxiety. A need for understanding how to best prevent this societal harm is worthy of exploration.

The purpose of this study was to better understand risky drinking behaviors as related to the differences in AUDIT item responses and other predictors by studying the relationship between those patients that are violently and nonviolently injured. Other predictors of risky drinking and the change in risky drinking, specifically of violently injured patients, were studied in an effort to obtain more knowledge about this population with the hopes of providing the highest quality of care and treating the whole person. This chapter offers a review of literature concerning hospital trauma care and risky drinking, a theory of change, the historical treatment of alcohol use disorders and brief counseling, screening and brief intervention and referral to treatment, and the AUDIT as an important screening tool. Significant empirical research on alcohol screening and brief interventions in the medical setting and trauma centers is addressed. The nature of violent injury and the mechanism of injury in conjunction with alcohol consumption will be investigated. Additionally, each potential predictor applied in previous research also is discussed. The concluding section summarizes the chapter; and from the exhaustive literature review, significant conclusions are presented.

Risky Drinking and Trauma

Risky drinking, also considered alcohol misuse, is described as consuming more than low risk limits of alcohol while not being diagnosed with alcohol abuse or dependency (Botelho, Engle, Mora, & Holder, 2011). The US National Institute of Alcohol Abuse and Alcoholism (NIAAA) describes at-risk drinking for men as drinking more than 14 standard drinks in a week or more than four drinks on one occasion; at-risk

drinking for women is considered seven drinks per week or more than three drinks on any one occasion (NIAAA, 2010). According to Botehlo et al. (2011), risky drinking can lead to many negative medical and psychosocial consequences.

Drinking in excess can also lead to an Alcohol Use Disorder. According to the Diagnostic Statistical Manual of Mental Disorders, 5th edition, alcohol abuse and dependency are combined into one disorder called Alcohol Use Disorder (AUD) with three subcategories: mild, moderate, and severe (American Psychiatric Association, 2013). A diagnosis of Alcohol Use Disorder requires certain diagnostic criteria. Those who meet the AUD criteria may include: difficulty regulating consumption of alcohol, drinking alcohol despite consequences, drinking leading to risky situations, and development of a tolerance and/or withdrawal symptoms (APA, 2013).

Intoxication may result in cognitive and motor skill impairment, drowsiness, and aggressive conduct (Feil et al., 2010; Ito, Miller & Pollack, 1996; Kumar, Werner, Matthews, Diaz-Granados, & Helfand, 2009; Weissenborn & Duka, 2003). Subsequently, these consequences of intoxication lead to increased risk of injury. Current studies have found that alcohol misuse and abuse is a significant risk factor for traumatic injury including suicides, gunshot and stab wounds, falls, drowning, domestic violence, and motor vehicle crashes (Cherpitel & Ye, 2014; Gentilello, 1995; Gentilello, Ebel, Wickizer, Salkever, & Rivara, 2005). The World Health Organization reported that alcohol causes 1.8 million deaths per year, half of which were due to traumatic injuries (Heather, 2007). Many of those individuals sustaining an injury warrant admission to a trauma center.

According to the American College of Surgeons (ACS), there are 109 accredited Level I trauma center in the nation (ACS, 2012a). ACS is the organization that oversees the Committee on Trauma which serves to verify the trauma center programs throughout the nation. The main role of ACS is to, "improve the quality of care for the surgical patient by setting high standards for surgical education and practice" (ACS, n.d., para 1.) Level I trauma centers must serve over 1200 patients annually (American College of Surgeons Committee on Trauma [ACS-COT], 2006). These specialized centers must meet strict standards in order to provide care to the most critically injured patients. Injuries consist of violent injuries, (e.g. assault, gunshot wounds and stabbing) and nonviolent injuries, (e.g. motor vehicle accidents, falls, and pedestrians struck by vehicles. Level II trauma centers only need trauma surgeons on call. Also, Level II centers do not have an annual required minimum of patients to provide care. (ACS-COT, 2006).

According to the ACS-COT around 50% of all male trauma patients and 40% of all women trauma patients have alcohol in their system at the time of injury (ACS-COT, 2006; Soderstrom et al., 1997). Gentilello et al. (2005) explained that trauma registries have been created to analyze data in order to prevent injury and enhance the quality of care at trauma centers, thereby decreasing the death rate in trauma centers from 40% to approximately 4%. These analyses included reviewing the high rates of alcohol use and the impact on patient care. Gentilello et al. posited that the work of screening and brief intervention is a preventative measure to reduce injury recidivism and improve patient care.

Another study found that 71% of those admitted to trauma centers had positive

screenings for drugs or alcohol (Cornwell et al., 1998), thus confirming that more than half of the patients in trauma units were under the influence of alcohol when a traumatic injury occurred. Similarly, those patients who are identified as risky or high-risk drinkers are twice as likely to be readmitted to the hospital with traumatic injuries (Dischinger et al., 2001; Gentiello et al., 1999; Hungerford, Pollock, & Todd, 2000; Kaufmann, Branas, & Brawley, 1998; Worrell et al., 2006). Moreover, positive blood alcohol levels have been correlated with higher rates of trauma recidivism, and these patients require longer and more acute care during hospital stays (Kaufmann, Branas, & Brawley, 1998; Moore, 2005). Consequently, in 2005 the American College of Surgeons Committee on Trauma (ACS-COT) acknowledged alcohol-related injuries as a significant medical concern and in 2006 made the landmark decision to require Level I trauma centers to have a means to identify patients with risky drinking habits and provide interventions to them (ACS-COT, 2006). However, the manner in which this screening and intervention was to be conducted was not specified thus, striking variability exists across the numerous national Level I trauma centers (Terrell et al., 2008). In an effort to discover what trauma centers were specifically delivering, Terrell et al. conducted a survey of 104 Level I trauma centers, of which 73% completed. The study found that 39% of the centers regularly implemented a screening question or screening assessment. Of those screened in for risky drinking, 25% received an "alcohol consult or an informal alcohol discussion" by various medical providers such as social workers, nursing staff, substance use counselors, psychiatrists, psychologists, trauma residents and surgeons. Forty percent of the trauma centers reported providing brief interventions or motivational interviewing interventions specifically. The study did not mention who provided these interventions, the training, or

qualifications associated with offering these counseling interventions. It is important to note that only one third of the trauma centers provided funding for these ABIRT services which may have influenced the decision making associated with who conducted the interventions, however this was not indicated. Hence, it seems important to further investigate the effectiveness of counseling intervention within trauma centers for at risk patients which is the case with this study.

Hospital Trauma Care

Hospital trauma centers are well suited to address this distressing worldwide concern related to the contributions of substance use to traumatic injury. Trauma centers are medical systems that provide quality care to injured populations (Gunning et al., 2015). The first trauma care system began over 40 years ago worldwide and has become a surgical specialty area with trauma surgeons highly trained in this specialty. The Committee on Trauma (COT) is the "oldest standing committee" within the American College of Surgeons (ACS) which was founded in 1913. In 1960s, the first trauma center in the United States opened its doors at Harborview Medical Center in Washington. There are five tiers of trauma centers that provide various levels of care. For the purposes of this study, only the level I are discussed. A level I trauma center serves the most critically injured patients. According to the American Trauma Society, "A Level I Trauma Center is a comprehensive regional resource that is a tertiary care facility central to the trauma system. A Level I Trauma Center is capable of providing total care for every aspect of injury – from prevention through rehabilitation" (American Trauma Society, 2015, para. 3). Furthermore, trauma centers undergo a rigorous verification process conducted by the American College of Surgeons Committee on Trauma (ACS-

COT) to evaluate and improve quality of trauma care. This verification process includes, "commitment, readiness, resources, policies, patient care, and performance improvement" (American Trauma Society, 2015, para. 3).

A substantial proportion of patients admitted to trauma centers have alcohol-related injuries. This finding makes trauma centers a crucial point of entry to address problematic drinking by means of alcohol screening and brief intervention. Current research indicates that trauma centers and emergency departments are key locations in addressing this rampant health problem (Barnett et al., 2008; Hungerford, 2005; Saitz, 2005). These studies have led trauma centers to acknowledge and incorporate alcohol misuse as an important aspect of trauma center care, especially as it relates to the prevention function of a trauma center. In fact, ACS-COT has standards that address this very concern. The ACS-COT states, "Universal screening for alcohol use must be performed for all injured patients and must be documented (CD 18–3). At Level I and II trauma centers, all patients who have screened positive must receive an intervention by appropriately trained staff, and this intervention must be documented (CD 18–4)" (ACS-COT, 2014). Yet, little research has been conducted on alcohol-related, violently-injured patients. Because of the prevalence of violent injury, further investigation is warranted.

Violent Injury.

There are two types of traumatic injury, those that are intentional and those that are unintentional. Intentional injury refers to injury sustained by violent acts either by an assault, gun or knife. Unintentional injuries are those that are accidental in nature, such as motor vehicle accident or a fall (SAMHSA, 2014b). In the literature these terms may be used interchangeably. For the purposes of this study, the language nonviolent and violent

is used. This study's categorization of violent and nonviolent will be discussed. Only in the 1990s did violence become a public health problem that could be addressed through the social and behavioral sciences. Additionally, the first trauma centers in San Francisco and Chicago became prominent organizations in urban centers that cared for those injured by a high volume of urban violence. Today many trauma centers recognize the need to intervene at the bedside and prevent future violent injury. Also, in recent years, although not mandated, a select few trauma centers have developed violence prevention programs (Cooper, Eslinger, & Stolley, 2005). The aim of these programs is to reduce recidivism, medical demands, and costs associated with violent injuries. A recent study was conducted at a Level I trauma center to examine the differences between two types of programs (Aboutanos et al., 2011). Patients between the ages of 10 to 24 years were randomly selected to receive either brief psychoeducational violence intervention while in the hospital or the brief violence intervention as well as a six month "wraparound community case management services" The brief violence intervention consisted of psychoeducation, motivational interviewing, and CBT therapy. The community wraparound services involved individualized services such as vocational resources and support, health care, mental health, and substance abuse services, recreational and conflict resolution programs, parental education and support as well as housing assistance. The study analyzed recidivism, alcohol abuse, and service utilization. The researchers reported that all the participants, regardless of intervention, were not readmitted for the hospital for violent reinjury or death. Furthermore, the participants who received a brief intervention and wrap around services were less likely to consume alcohol at six weeks and six months than those only receiving the brief intervention.

Likewise, the patients were also more likely to utilize additional services. However, the authors do submit that the high rates of service usage were perhaps due to the dedication of the research team and the community partners and that the outcomes may vary depending on the parties involved in supplying these resources. Also, they suggested that the community wrap around services may require long term follow up in order to be most effective.

Research indicates that individuals engaged in violence are more likely to abuse alcohol and drugs (Chermack et al., 2014; Dischinger et al., 2001; Walton et al., 2009). Dischinger et al. (2001) reported that those patients who sustained violent injuries had higher blood alcohol and drug toxicity than those patients with nonviolent injuries. Within the emergency care setting, patients may be suffering from both illnesses and injuries and may not be admitted to the hospital, Choo et al. (2014) proposed that the most effective approach to reduce violent injury was by also addressing substance use simultaneously. Another study focused specifically on violence and alcohol intervention with teens in the emergency department sought to compare the difference between computerized and based brief intervention (Cunningham et al., 2009). In this study, 533 adolescents age 14-18 who endorsed violence and substance use within the past year were randomly assigned to a brief intervention on a computer, a brief intervention with a therapist, or to a control group while admitted. The therapists' training was utilizing the SafERteens model that is based in motivational interviewing and skills training approaches. The concepts of motivational interviewing (MI) are commonly used with those struggling with alcohol abuse and not violence. This adaptation of motivational interviewing focused on alcohol misuse and violence intervention. Like MI, the clinician

was encouraged to be respectful, nonjudgmental, and nonconfrontational in demeanor, essentially taking on a person-centered way of being. MI also emphasizes independence, autonomy, and choice as well as pointing out discrepancies in behaviors and beliefs, values or goals. Lastly, the clinician was encouraged to "roll with resistance"—meaning reflecting the patient's discrepancies back to them. Additionally, the participants were offered skills training, such as role play of high risk alcohol-related situations. The same content was used with the computer intervention. The participants created animated character personalized by gender, race and age to guide them through the intervention. The study assessed positive attitudes toward alcohol and violence, self-efficacy associated with ability to refrain from alcohol use and violence, and readiness to change alcohol consumption and involvement in violence. Two questions, "how often have [you] gotten into a ''serious physical fight'' or ''took part in a fight where a group of my friends was against another group" from the National Study of Adolescent Health were used to assess violent behavior change. Also, the participants were asked if they were affiliated with a gang. The AUDIT-C and the CRAFFT were used to assess substance use. The findings revealed a reduction in positive alcohol consumption (therapist, p = 0.002, computer p = 0.0001, d = .39) and violence (therapist, p = 0.004, d = .25; computer p = 0.002, d = .22) with both types of interventions. However, only self-efficacy related to alcohol use (therapist, p = 0.050, d = 0.20; computer p = 0.083) improved with the therapist brief intervention. Furthermore, readiness to change alcohol use and violence did not significantly change in either intervention. Because alcohol misuse and abuse is such a prominent aggravating factor in violent injury, it is important to continue to investigate the ways to address the reduction of alcohol consumption,

thereby reducing violent injury. A few limitations in the study did exist, namely those that influenced the sample. The sample came from this specific urban ED and had limited diversity, specifically limited of Hispanic adolescents.

Theory of Change

For at least the past decade, research has been dedicated to identifying techniques and contexts to encourage healthy behaviors while discouraging unhealthy ones. One such concept is referred to as the "teachable moment". A uniform understanding of the notion of the teachable moment is absent. However, the teachable moment has been described as a health event or circumstances that can bring about change in health behaviors. It has also been described as moments generated by patient and clinician interaction to promote change (Flocke et al., 2014; Lawson & Flocke, 2009; McBride et al., 2008). Through a comprehensive review of several disciplines, Lawson and Flocke identified several descriptions of the teachable moment phenomenon. First, they found that the term the teachable moment is defined in terms of unpredictability and as an opportunity for learning due to specific contextual elements, but this event does not demand the involvement of a professional. Ultimately, they determined that it can, in fact, be co-created through an interaction between two parties by which mutually agreed-upon goals, views, information and emotions are exchanged. Said another way, the teachable moment can be conceived as the collaborative interaction between two parties at a particular time to create learning and change. Much of the research has focused on retrospective analysis of what is deemed a teachable moment. Little research has been conducted on the teachable moment that arises due to a violent interaction between two parties. Lawson and Flocke (2009) encouraged continued research to determine the

efficacy of interventions conducted during a teachable moment. This study's data is on a perceived teachable moment between counselors and inpatient trauma patients.

A medical trauma or near-death experience can act as an influential catalyst towards change (Aboutanos et al., 2011). Studies indicate that the "teachable moment" should be utilized with patients sustaining alcohol-related traumatic injuries (Mitka, 1998). The American College of Surgeons Committee on Trauma (ACS-COT) mandate of the establishment of alcohol screening and brief intervention (ASBI) in level I trauma centers and level II trauma centers is an example of capitalizing on the "teachable moment" as a means to reach these patients and to implement SBIRT as a standard means to provide care in trauma. In fact, it is written in the ACS-COT standards, "Universal screening for alcohol use must be performed for all injured patients and must be documented (CD 18–3). At Level I and II trauma centers, all patients who have screened positive must receive an intervention by appropriately trained staff, and this intervention must be documented (CD 18–4)" (ACS-COT, 2006, p. 3). Healthcare professionals have been tasked with assuming this duty to bring about change during the teachable moment that so often occurs while a patient is admitted to a trauma center after an injury.

Brief interventions are commonly employed during a Teachable Moment. Brief clinical trials have determined six vital components employed during this critical time (Crawford, et al., 2010; Dauer Rubio, Coris,& Valls, 2006; Madras, et al., 2009; Neumann et al. (2006). These elements are represented in the FRAMES approach that consists of feedback, responsibility, advice, menus, empathetic counseling, and self-efficacy (Miller & Sanchez, 1993). The F in FRAMES is the feedback which is described as risk or impairment information offered to the client after a substance use assessment.

The R is the responsibility to change which is determined by the patient and not the clinician. The A is the advice to change which is offered by the clinician. Lastly, the menus is the treatment and help options provided by the clinician. Empathic counseling is the counseling approach to support the patient. Self-efficacy is the empowerment instilled in the patient (SAMHSA, 2014b).

History of the Treatment of Alcohol Use Disorders

Humans have a long history with alcohol, dating back to the 5,000 B.C. with the Babylonians (Spicer, 1993). This mood altering beverage is referenced in religious ceremonies and cultural traditions, as well as social and political gatherings. In fact, due to poor sanitation, wine and beer were the drink of choice. Naturally, the heavy influence of alcohol came with societal and individual consequences. The Temperance Movement began a conversation about the negative effects of alcohol (Spicer, 1993). Since then, the treatment for those suffering with alcohol use disorders has been evolving since its inception in the 18th Century. Increased awareness around the harms associated with alcohol use disorders has led to the establishment of inpatient treatment centers, numerous federal policies and acts, acceptance of alcoholism as a disease, numerous addiction therapy models, and the creation of several national groups, such as Alcoholics Anonymous (White, 1998). However, despite acknowledgement of the harms associated with alcohol misuse, for much of history, alcohol use disorders have been perceived as a moral failing. Those in support of alcohol treatment have faced substantial discouragement and stigmatization (Spicer, 1993; White 1998).

It was not until the 1950s that the tides began to turn. In 1955, alcoholism was acknowledged as a public health problem by 38 states. The states also sponsored

alcoholism initiatives, but this effort was sporadic and relatively unpredictable. A critical federal recognition of alcoholism began with Vocational Rehabilitation Act modification of 1956 that decreed that those with alcoholism were eligible for vocation rehabilitation services (Hart, 1977). Treatment centers remained mainly in psychiatric hospitals in the 1950s. Only a few states had units designated especially for alcoholism treatment. Only approximately 200 treatment programs existed during this time. In fact, many suffering with alcoholism were turned away from seeking treatment at hospitals (Spicer, 1993).

Then, beginning in the 1950s the Minnesota Model (MM)—also referred to as the Willmar or Hazelden Model—was developed in Minnesota by Dr. Daniel Anderson and soon spread throughout the nation becoming the widely accepted treatment for alcoholism. It represented a progressive step from viewing alcoholism as a moral fault weakness towards a chronic diagnosable and progressive disease if left untreated (White, 1998). The Model highlights these core elements: acknowledging that alcoholism is a disease and treating those suffering with alcoholism with respect and as a whole person (Spicer, 1993; White, 1998). It also incorporates knowledge from Alcoholics Anonymous into treatment provided by a multidisciplinary team of professionals including counselors (O'Dwyer, 1993). The model is now one of the models most widely embraced today.

Brief Counseling

Since the inception of talk therapy, brief counseling has played a substantial role in the field of counseling, namely addiction therapy (Spicer, 1993). Surprisingly, brief counseling, also known as brief therapy, grew out of the psychodynamic movement with support from Freud. Today a debate remains over the true meaning of brief counseling. Some view it as consisting of one to 40 sessions while others consider brief therapy as

only a single session. However, some clear differences do exist. Compared to longer term counseling, brief counseling emphasizes the present moment and particular behavioral change. An agreed upon definition is that brief therapy occurs within a shorter time period and consists of less sessions than "traditional" therapy (Storie, Kuehn, Mikell, & National Association of Alcoholism and Drug Abuse Counselors [NAADAC], 2005).

There are several forms of brief counseling. Solution-Focused Brief Therapy (SFBT) is a type of therapy based in constructivist theory. De Shazer (1988) encouraged therapists to focus on the client generating solutions rather than the problem. SFBT is widely used within the medical setting (Nelson & Thomas, 2012). Motivational Interviewing is a brief intervention also used in the medical setting by various medical professionals to address risky drinking (Botelho et al., 2011). Motivational Interviewing is considered an efficacious intervention of the misuse and abuse of alcohol and other negative health behaviors. It is also defined as "a collaborative, person-centered form of guiding to elicit and strengthen motivation for change" (Miller & Rollnick, 2009, p. 137).

There are several positive aspects of brief therapy. Brief counseling is largely considered effective in practice (Bien, Miller, & Tonigan, 1993; Storie et al., 2005). According to Holder, Longabuagh, Miller, and Rubonis (1991), brief counseling is one of the most supported research approaches of alcohol misuse. More than 12 randomized controlled studies determined that brief counseling interventions are more effective than no counseling as well as long term treatment (Bien et al., 1993). The largest evaluation was conducted by the WHO which screened over 32,000 patients in a variety of health care settings worldwide. In this study, 1490 risky drinkers received 20-minute interviews, then were randomly assigned to 15 minutes of brief counseling, 5 minutes of advice,

counseling with advice and a self-help guide, or no counseling or advice. At the 9-month follow up, the alcohol consumption of the participants who received brief counseling or brief advice reduced significantly as compared to those who did not receive counseling or advice.

A growing need for brief counseling has developed in recent years. One reason is due to the financial burden of long-term addiction treatment (Storie et al., 2005) and abuse which may range from 30 days to a year in some cases. In fact, insurance companies are more likely to accept brief counseling as a covered service (Murphy, 2013). However, even if it is covered by insurance status, some may be unwilling to receive treatment; thus brief counseling has been found to meet this population's needs (SAMHSA, 2014b). Some professionals even encourage brief counseling before entering into more long-term counseling because it may meet their needs (Budman & Gurman, 1988; Cummings, 1990; Wolberg, 1980). Additionally, brief counseling, by nature of its brevity, can reach more people and lower socioeconomic groups, thus creating greater access to care. Brief counseling can also help clients develop insight into the consequences and problems with drinking that one may not currently be known (SAMHSA, 2014b). Therefore, brief counseling has become a greatly needed and desired option.

Only recently, in the past two decades, the belief has emerged that substance abuse and dependency is only a part of the larger problem associated with the societal cost of substance use. A shift toward recognizing hazardous drinking has led to an increase and need to incorporate brief interventions in addressing this problem. Contrary to the traditional treatment settings, brief interventions are employed at what is deemed

"opportunistic settings"; this may include but is not limited to primary care offices, hospitals, in the courts systems, and universities. The goal is to reach people when they are utilizing other services (SAMHSA, 2014).

Since the early 1980s, studies have been able to illustrate the efficaciousness of alcohol brief interventions. For instance, research of brief counseling interventions for risky drinkers has reliably shown a statistically significant reduction in drinking as compared to both no counseling and longer term treatment (Bien, et al., 1993). However, it is important to note that the core tenet of Carl Roger's Person-Centered Counseling is viewed as a necessary element in brief counseling interventions. Miller (2000) posited that empathy in brief interventions plays a large role in the efficaciousness of brief interventions. Studies have found that a single empathic counseling sessions is as effective as multiple counseling sessions (Beutler Machado, & Neufeldt, 1994; Chafetz et al. 1962,1964). Studies indicate that in fact problem drinkers whose therapists display more accurate empathy had more successful outcomes after a brief intervention than those therapists with lower empathy (Miller, Taylor, & West, 1980; Valle, 1981). Because studies have emphasized client-centered (empathetic) counseling, a study was conducted that focused on confrontational counselor behaviors and the drinking behavior outcomes. Researchers found that 12 months after an intervention the counselor's confrontational style was correlated with increased drinking behaviors (r = .65) (Miller et al.,1993). Alcohol brief counseling is indeed successful, but only if conducted with empathetic counselors.

Screening, Brief Intervention, and Referral to Treatment

Screening, brief intervention, and referral to treatment (SBIRT) is an evidence-based approach designed to identify, reduce, and prevent the misuse and abuse of alcohol and illicit drugs worldwide (SAMSHA, 2013; Vaca & Winn, 2007). SBIRT is generally implemented within a medical system. The aim is for clinicians ranging from healthcare professionals to support staff to target patients at risk for hazardous drinking behaviors that can develop into addiction (Office of National Drug Control Policy [ONDCP] & Substance Abuse and Mental Health Service Administration [SAMSHA], 2012). In other words, it fills the gap between prevention and treatment for dependence (Agerwala & McCance-Katz, 2012). SBIRT is comprised of four elements. First, a screening is conducted to assess for substance use problems (ONDCP & SAMSHA, 2012). Screening does not determine the severity of the problem, but simply if a problem is indicated based on the screening results (SAMSHA, 2013). Screenings are brief and may last from 5-10 minutes. Many screening tools are used in SBIRT such as the Alcohol Use Disorders Identification Test (AUDIT), CAGE, Drug Abuse Screening Test (DAST), and Michigan Alcohol Screening Assessment (MAST) (SAMSHA, 2013). Second, if risky to severe use is identified, a brief intervention is conducted (ONDCP & SAMSHA, 2012). In traditional SBIRT, motivational interviewing approaches are utilized to explore awareness, consequences, and motivation to change. Third, a referral to treatment is made for those patients identified as being at severe risk for a substance use disorder (ONDCP & SAMSHA, 2012). Certain standards for a patient diagnosed with an AUD or SUD have been established as a means for those patients to receive appropriate treatment. The American Society of Addiction Medicine (Mee-Lee, 2013) created client placement

criteria for the treatment of substance use disorders. The criteria are broken into four levels (categories) of treatment services: early intervention (0.5 Level), outpatient services (Level I), intensive outpatient and partial hospitalization (Level II), residential inpatient services (Level III), and medically-managed intensive inpatient (Level IV). Of these levels, those substance users best suited for brief interventions are the nondependent substance users which would receive services at Level .05 and perhaps Level I (SAMHSA, 2014).

The national implementation of SBIRT came to fruition because of the research outcomes of numerous studies that proved the empirical outcomes of SBIRT (ONDCP & SAMSHA, 2012). This research substantiates that the approach is successful for those with risky drinking behaviors (Bien et al., 1993; Kahan, Wilson & Becker, 1995; Wilk, Jensen, & Havighurst, 1997). Such studies indicated that SBIRT has short-term health benefits and also may lead to long-term health benefits as well, such as reduced harmful use and injury recidivism (Babor et al., 2007; Genitello, 2007; Madras, et al., 2009). Additionally, many studies proved the cost-effectiveness of utilizing SBIRT within medical systems (Estee, He, Mancuso, & Felver, 2006, Gentilello et al., 2005). Subsequently, the Federal Government under SAMHSA's Center for Substance Abuse Treatment created the first SBIRT grantee program with the goal to establish SBIRT services within medical settings nationwide. Several of these studies will be addressed in depth later. For the purposes of this paper, we will be exploring only alcohol screening and brief intervention (ASBIRT).

Alcohol Use Disorder Identification Test.

The screening aspect of ASBIRT is essential to the process. The AUDIT is a screening tool commonly used in ASBIRT and for the purposes of this study was used as the measurement of change in risky drinking behaviors. The AUDIT was developed to fill a need for an international, refined, multiculturally appropriate psychometric assessment (Reinert & Allen, 2002). It is considered the gold standard for alcohol assessments (Heather, 2007; Saunders et al.,1993). It was developed by the World Health Organization to screen for harmful drinking habits (Reinert & Allen, 2002; Saunders et al, 1993l Sinclair; McRee & Babor, 1992). The World Health Organization Early Intervention Project produced the AUDIT specifically to identify early alcohol problems in the primary care setting (Saunders et al. 1993). But it has been used in several other medical settings and other nonmedical venues as well. The AUDIT is widely used as a screening tool for ASBIRT and ASBIRT research (Cunningham et al., 2009; Zatzick et al., 2014). A few features make the AUDIT different than other alcohol assessment instruments. Namely, it is short, only consisting of 10 items, which makes it ideal for the medical systems for which it is used. Also in order to identify early risky drinking behaviors, the AUDIT items focus on harmful drinking and less on dependence or consequences (Piccinelli et al, 1997). The AUDIT also assesses for current past drinking habits, not drinking habits over ones' life, particularly within the past year. A score range from 8-15 indicates risky drinking behaviors while a score from 16-40 represents that a further evaluation is needed to determine alcohol dependency (Reinert & Allen, 2002). It is divided into four conceptual domains: questions 1-3 address alcohol consumption; questions 4-6 assess drinking behavior; questions 7-8 assess adverse reactions; and 9-10

measure alcohol-related problems (Saunders et al., 1993).

The AUDIT is particularly valuable for the current study because of its predictive value. Conigrave, Hall, and Saunders, (1995) studied the total AUDIT score in an effort to predict illness and social issues, hospital readmissions, and mortality. In a 2 to 3 year period, they found that the total AUDIT score of eight predicted more illness, social issues, and hospital readmissions. They also found that gamma glutamyltransferase (GGT)—a liver enzyme that increases with chronic alcohol abuse and causes liver damage—was a predictor of mortality. This study illustrates that the AUDIT has predictive use with risky drinkers which pertains to this study's research questions.

The AUDIT is a useful and powerful means to assess risky drinking behaviors. The AUDIT is the screening tool used in this study to determine alcohol misuse or risky drinking. Within this study, in an effort to better understand the differences between violently injured patients and nonviolently injured patients risky drinking habits, each AUDIT item response was analyzed.

Alcohol Screening and Brief Intervention in the Medical Setting.

An abundant amount of research has emphasized the significance of brief interventions in aiding people to change risky drinking behaviors. Over 15 systematic and meta-analyses of SBIRT in several medical settings from primary care, emergency department, college student health centers, and trauma centers, emphasize several positive aspects of SBIRT. In fact, research suggests that a 20-30% reduction in drinking occurs after one brief intervention. Furthermore, SBIRT serves as a gateway to seeking long term treatment (Babor et al., 2007; Babor, 2008; Walton et al. 2009).

Research has found that five minutes of ASBIRT can reduce risky drinking habits. ASBIRT reduces health problems and other consequences associated with risky drinking and is valuable across many populations (Casa Columbia, 2012). Largely, brief interventions have been found to be effective in primary care settings, emergency departments, and student health centers (Agerwala & McCance-Katz, 2012; Larimer, Cronce, Lee, & Kilmer, 2004; ONDCP & SAMSHA, 2012). Several studies conducted on several screening and brief interventions focused on the reduction of drinking as addressed in the medical setting by means of a variety of techniques. Some include: advice giving compared to brief intervention, brief intervention and community wrap around support, telephone interventions, and computerized interventions (Soderstrom et al., 2007; Vaca, Winn, Anderson, Kim, & Arcila, 2011). One study utilizing computers in the ED to administer ABIRT with the AUDIT as a screening instrument found that at 6-month follow up, 47% of the participants who received the computerized ABIRT had cut back to drinking below the NIAAA risky levels (Vaca et al., 2011).

Regardless of the type of brief intervention in the medical setting, studies have indicate that brief interventions prevent and reduce harm related to alcohol consumption and sometimes are more effective than longer more intensive treatment (Bien et al., 1993). In a 1997 meta-analysis study of 12 randomized controlled trials conducted in outpatient settings, inpatient settings and with the general population, researchers assessed the efficacy of brief interventions compared to no intervention on “problem or heavy” drinkers ages 19-60. Results indicated that a brief intervention is twice as likely to reduce alcohol consumption 6 to 12 months post intervention with severe risk drinkers (Wilk et al., 1997). Several studies have also illustrated the efficacy of brief interventions

specifically in the primary care setting. Ballesteros, Duffy, Querejeta, Ariño, and González-Pinto (2004) conducted a meta-analysis of 13 studies worldwide in patients ages 18-70. The studies were randomized trials with two or more interventions and follow ups at 6 and 12 months within the primary care setting only from the late 1980 to the 2000s. The study included moderate to severe drinkers. The review found that brief interventions in risky drinkers are efficacious in the primary care setting for both heavy and risky drinkers. However, the study called for more research to address the long term drinking outcomes as well as with heavy drinkers specifically.

According to a systematic review of 27 articles, brief alcohol interventions have also been highly effective in emergency departments at reducing alcohol consumption and the harmful consequences; thus implementation is recommended (D'Onofrio & Degutis, 2002). From an international perspective, Cherpitel et al. (2010) conducted a randomized controlled trial of 446 patients in an emergency department in Poland. The patients were divided into three groups, those that received a screening, those that received an assessment, and those that received an intervention. The study found that risky to severe risk patients provided with a brief intervention had long-term benefits. Another study sought to examine alcohol brief intervention (ABI) in large public hospital emergency department. The AUDIT was used to screen those patients; of those who screened a score above 6, a brief counseling intervention was provided. In this study, 59% of the patients made goals to reduce or stop drinking alcohol. A three month follow-up was conducted to assess for alcohol use and harm, dependence symptoms, and a readiness for change. Of those patients contacted, 68% reported a statistically significant reduction in drinking, 52% reported a significant reduction in harm—described as legal,

health, and social consequences, and 61% experienced a reduction in alcohol dependence symptoms. Likewise, 43% of patients' readiness to change scores increased. Overall, the participants indicated that the brief counseling intervention was a valuable aspect of their emergency hospital visit (Hungerford, et al., 2000). This study's outcomes warrant continued research into brief counseling interventions in various settings with diverse populations.

Alcohol Screening and Brief Intervention in Trauma Centers.

Now more than ever, trauma centers are serving as primary locations for the incorporation of alcohol screening and brief intervention, namely because trauma care is negatively impacted by alcohol misuse and abuse as well as increased health care costs (Gentilello et al., 2005). Additionally, studies revealed that having a conversation with trauma patients about their alcohol consumption can reduce risky drinking habits. In a seminal study, Gentiello (1995) advocated for the administration of (ASBIRT) in trauma centers. The researchers found that trauma recidivism can be reduced by 50% by conducting a brief intervention specifically at such a crucial and vulnerable time. It is clear that alcohol brief interventions are greatly needed in the trauma setting; therefore continued research on counseling brief inventions is needed.

The type of alcohol screening and brief intervention referral to treatment (ASBIRT) varies depending on the trauma center providing it. ASBIRT is comprised of three components: an alcohol screening, a brief intervention, and referral to treatment. According to the American College of Surgeons Committee on Trauma (ACS-COT), the trauma center must screen the admitted patients for risky drinking (ACS-COT, 2014). Some ways this is accomplished is through blood alcohol concentration (BAC) levels

taken or a prescreening question asked upon admission (ACS-COT, 2006). The BAC is an objective means to screen patients whereas the prescreening question is less so, as the patient could underreport use. Those patients screened into the service will then receive additional screening with an instrument selected by the trauma center. Some assessments used are the CRAFFT, CAGE or AUDIT. Then the brief intervention follows the screening. The overarching goal of a brief intervention is to help patients explore risk related to alcohol misuse. Three aspects of brief intervention: "understanding patient's views of drinking and enhancing motivation", "giving information/feedback", and "giving advice and negotiating" (SAMHSA, 2007, p. 7). The ASBIRT can occur by the bedside with a variety of professionals.

At the trauma center where this study was conducted, counselors are the professionals providing a brief counseling intervention. Once the counselors have identified a patient as a risky drinker, a brief counseling intervention is conducted. The average intervention last roughly 30 minutes. If a patient is suffering with alcohol dependence, a referral to treatment is offered (O'Brien, Reboussin, Veach, & Miller, 2012). The ASBIRT provided specifically in the *Teachable Moment* study will be discussed in more detail in Chapter 3.

Without an intervention, alcohol misuse and abuse can become alcohol dependence which leaves individuals more vulnerable to injury or even death (Dischinger et al., 2001). Brief interventions in trauma centers have been shown to reduce trauma recidivism (Gentilello et al., 1999; Hinde, Bray, Aldridge & Zarkin, 2015). Gentilello et al. (1999) enrolled 762 trauma patients at a level I trauma center to a randomized control trial, of which 366 received one brief intervention based in motivation interviewing by a

psychologist, the remaining 396 patients served as the control. At the 12 month follow up, they found that those who received the brief intervention significantly reduced the number of drinks. The reduction in alcohol consumption was more significant with those patients with mild to moderate alcohol problems. Additionally, reinjury reduced by 48% based on a three year follow up of hospital readmissions. Hinde et al. (2015) also sought to identify the impact of ABIRT on injury recidivism. They used data from the Arizona State Inpatient Database (SID) to select six trauma centers utilizing brief alcohol interventions mandated by ACS-COT. They found that those receiving ABIRT had a significant reduction in injury readmission as compared to those not receiving the intervention. In short, they determined that ABIRT decreased the probability of a re-hospitalization due to an alcohol-related injury. In 2005, the American College of Surgeons passed a mandate that level I trauma centers screen for and intervene with risky drinkers, thereby reducing the incidences of trauma recidivism (American College of Surgeons Committee on Trauma [ACS-COT], 2006). Shortly after this mandate, a national committee to establish Alcohol Screening and Brief Intervention was created to form guidelines for this process (SAMHSA, 2007).

Several research studies have sought to address the association between traumatic injury and alcohol brief interventions. A randomized control trial was conducted to compare the effectiveness of motivational interviewing brief intervention and brief information with advice session provided by a PhD level psychology student in patients 18 years or older admitted to a level I trauma center. The results indicated a reduction in alcohol consumption, in risky drinking habits, and consequences (Soderstrom et al., 2007). Another study, with nurses providing a brief intervention to patients admitted to a

trauma center due to a motor vehicle accident, also reported a reduction in alcohol consumption, risky drinking, and frequency of injury (Sommers et al., 2006). Apodaca and Schermer (2003) conducted a study on trauma center patients' readiness to change risky drinking habits following a traumatic injury. This study only conducted a screening with a questionnaire about drinking habits and willingness to change, but not a brief intervention. All of the patients were screened into the study based on a positive blood alcohol level. The mean blood alcohol level was 197 mg/dL upon admission. The results indicated that when faced with negative consequences, such as a traumatic injury, patients are more motivated to change. The vast majority of the participants (84%) reported considering reducing or quitting drinking. However, the research did not evaluate actual behavior change. The researchers emphasized the need for motivational interviewing for these patients. In a 2006 study, patients with a BAC (blood alcohol content) of greater than 100mg/dL were randomly assigned to four different computerized interventions. The researchers indicated a reduction in alcohol use and alcohol consequences in all the interventions (Blow et al., 2006). The results from the Teachable Moment study—from which this study archival data are analyzed—had two main findings. The study found that qualitative brief counseling intervention is as effective as a quantitative brief intervention in reducing alcohol consumption for patients at a level I trauma center. Second, the AUDIT scores significantly reduced at the 6-month follow up. Namely, lower AUDIT scores were correlated with greater change at the 6-month follow up (Rogers, Veach, Miller, & O'Brien, 2013). These studies confirm the need and efficacy of brief alcohol interventions following an injury. No studies have yet

to utilize counselors as the facilitator of the alcohol brief intervention in trauma centers for violently injured patients.

Predictors of Behavior Change

This study served to investigate the predictors of behavior change and explore the potential implications for counselors providing brief counseling interventions to alcohol related violently injured patients. These predictors may provide useful information as to why particular individuals may change more than others. It is important to determine if predictors may play a role in the actual change that occurs. In other words, some variables may predict the amount of change in risky drinking after a brief counseling intervention at the hospital bedside. If so, counselors may need to consider adjusting the brief counseling intervention to support these patients appropriately. The risk factors examined in the study are: resistance, insurance status, drug use, type of violent injury, race, age, and quality of life.

Resistance

Resistance can be viewed as a risk factor that may negatively impact change in risky drinking behaviors. Resistance as used here is behavior characterized by being unmotivated to change (Connors, DiClemente,Velasquez, & Donovan, 2012). From a therapeutic standpoint, resistant behaviors are marked by the avoidance of negative feelings, such as anxiety and guilt. In the context of individual counseling interventions, resistance is considered a conceptual impediment, and it is often associated with substance use disorders (SAMSHA, 2008). In layman terms it is a feeling of “stuckness” identified by the counselor.

If the role of the clinician in large part comprises the reduction of resistance—and concomitant stimulation of motivation to change—it stands to reason that the degree to which a counselor might affect change in risky drinking behavior in an individual is directly related to the degree to which the counselor is able to reduce resistance in that individual. Furthermore, it follows from the above discussion that the degree to which such a counselor is able to aid in the reduction of resistance would also be directly related to the degree to which the counselor might help change the likelihood of future violent injury. In other words, resistance may not merely be *relevant* to the care counselors provide to risky drinkers; it may have *predictive value* when considering the likelihood of future alcohol use and violent injury. Surprisingly, while resistance has been studied with other counseling approaches, resistance has yet to be researched with alcohol screening and brief intervention and thereby warrants analysis.

Insurance

The rates of Americans without insurance have decreased due to The Affordable Care Act, yet 47.3 million Americans remain underinsured or uninsured. It is important to draw attention to the needs of the uninsured. Very little is known about the relationship between insurance and alcohol misuse. What has been acknowledged is that individuals without insurance are more likely to have substance abuse or dependence (McApline & Mechanic, 2000; Norquest & Wells, 1991; Wells et al., 2002). Additionally, a national survey of 9,533 individuals was conducted to determine insurance status, satisfaction and use of alcohol, drug abuse, and mental health treatment. The study considered Medicare, Medicaid, partially and fully managed care, unmanaged, and uninsured individuals. A logistical and linear regression analysis indicated that those participants who were

uninsured were less likely to utilize treatment and/or were less satisfied with treatment. Those with Medicare used treatment the least; but when utilized, this population was the most satisfied. It stands to reason that this uninsured vulnerable population has unmet alcohol and substance misuse needs if treatment resources are not being utilized. ABIRT is a service that has not been researched in association with insurance status, nor have any studies to date analyzed violently injured risky drinkers and insurance status. Given the needs of the uninsured at risk for alcohol problems, it is important to investigate this population.

Drug Use

In 2013, 2.6 million people 12 years or older met the DSM-IV criteria for substance dependence or abuse of both alcohol and illicit drugs within the past year (SAMSHA, 2013). Alcohol is referred to as the "gateway drug" meaning that an individual typically drinks alcohol first then might try what is considered a "harder" drug such as marijuana, cocaine, or heroin. While this view is considered a theory, it has been supported by recent statistics from the National Institute on Drug Abuse (NIDA). For instance, a study conducted by SAMHSA in 2006 reported that 32.2% of hazardous drinkers were current users of illicit drugs. Similarly, the National Survey on Drug Use and Health (2013) found that 62.3% of heavy alcohol users between the ages of 12-17 also used illicit drugs as opposed to nondrinkers with only 4.9% using illicit drugs. Also, 46.6% of binge drinkers used illicit drugs and 43.2% used marijuana (SAMSHA, 2014a) However, it is important to remember that a correlation between drug use and alcohol does not imply causation. Many studies have indicated a correlation between specifically marijuana use and alcohol use. The US Department of Justice (2008) analyzed data from

the National Longitudinal Survey of Youth and found that 81% of youth who smoked marijuana also consumed alcohol. However, speculation still remains and more research needs to be conducted.

In the realm of trauma related injuries, studies have found that trauma patients are more likely to have consumed alcohol as well as drugs upon admission. One of the limited brief alcohol intervention studies to include drug use found that 50% of patients self-reported drug use upon admission to a trauma center (Gentilello et al., 1999). Dischinger et al. (2001) also reported that those patients who sustained violent injuries had higher blood alcohol and drug toxicity than those patients with nonviolent injuries. Field, Cochran, and Caetano (2011) sought to determine the relationship between drug use and drug dependence on the drinking outcomes after a brief alcohol intervention. Patients ages 18 and above at a level I trauma center, who showed clinical indications of intoxication, alcohol use, or had a positive Blood Alcohol Content (BAC), self-reported drinking within six hours of their injury, self-reported drinking above the NIAAA risk levels or were positive or one or more CAGE items, were randomized into the usual treatment or received a brief alcohol motivational intervention. Drug use and dependence were assessed using The Composite International Diagnostic Interview Short-Form (CIDI-SF). Also, drug use was evaluated as a moderator to change in drinking. The patients were assessed at 6- and 12-month follow-ups. At the six months, 36% of the patients reported using at least one drug. At the 12-months, 35% of the patients reported using at least one drug. When assessing for the impact of drug dependence, significant main effects and interaction effects were not detected ($p > 0.05$) in the models that tested maximum amount, average volume per week, or abstinence for Caucasian or Black

participants. However, a difference in ethnicity was identified when assessing the maximum amount consumed, the average volume per week, and the percentage abstaining from alcohol within the Hispanic patients. The Hispanic participants with drug dependence receiving a brief alcohol intervention drank less during their heaviest drinking episode at the six- (B = −1.08, SE = 0.46, p = 0.02) and twelve-month follow up (B = −1.62, SE = 0.52, p = 0.00; reported consuming less alcohol per week at six (B = −1.92, SE = 0.77, p = 0.01) and twelve month follow up (B = −2.71, SE = 0.86, p = 0.00); and reported a higher percentage days of abstinence at six (B = 0.27, SE = 0.10, p = 0.01) and twelve month follow up (B = 0.41, SE = 0.11, p = 0.00), The researchers posited that the change in drinking behaviors was not negatively influenced by drug dependence when the injury occurred. In other words, patients' drug dependence did not decrease the reduction in drinking after a brief intervention. However, drug dependence does seem to be associated with a reduction in drinking or abstinence among Hispanics.

Interestingly, a 2013 study conducted in two emergency departments with 436 participants found that alcohol and drugs are more significantly associated with violent injury than merely just alcohol use (Cherpitel et al., 2013). Yet, to date, no studies have examined drug use as a factor for those violently injured patients receiving a brief intervention for risky drinking. In light of this, given the high rates of comorbidity between drug and alcohol use within the trauma patient population, it is important to study drug use as a predictor of risky drinking outcomes with the violently injured population being provided with ASBIRT at the bedside.

Type of Violent Injury

As evidenced by the literature, violent injury is of paramount concern. It seems reasonable and valuable to examine the differences between the types of violent injury in order to provide appropriate counseling to those harmed by specific violent means. The National Trauma Data Bank reported that penetrating traumatic injury (gunshot or stab wounds) accounts for approximately 8-10% of all trauma injuries—of which half are a gunshot wound and half are a stab wound. Of the gunshot wounds, 10%-60% are correlated with high mortality rates, whereas a stab wounds mortality rate is as low as 0%-4% (ACS, 2012b). Greater than 88% of those with penetrating wounds have preexisting psychosocial issues, such as substance use as compared those with blunt trauma at 47%.

While studies have illustrated the statistically significant relationship between violence and alcohol use, few studies have been conducted associated with alcohol consumption and the kind of violent injury. One study did find that females involved in gun violence were also associated with high-risk alcohol use (Erickson et al., 2006). Despite the well-established association between alcohol misuse and violence, no study to date has examined the differences in the type of violent injury and drinking habits and change in risky drinking at trauma centers. In doing so, counselors may be better able support this population by understanding the differences in those patients with specific violent injuries.

Race

Variances in risky drinking and the consequences exist among ethnicities. The 2010 National Survey on Drug Use and Health (NSDUH) of individuals 12 years or older reported that Whites (56.7%), Blacks (42.8%) Asian Americans (38%), Hispanics (41.8%), and Native Americans (36.6%) consumed alcohol. Regarding binge drinking in the 2010 survey, Native Americans (24.7%), Whites (24%), Hispanics (25.1%), two or more races (21.5%), Blacks (19.8%), and Asians (12.4%) consumed four drinks (women) and five drinks (men) in two hours (SAMHSA, 2011). In the 2007 NSDUH study on heavy alcohol consumption (five or more drinks on the same occasion for five or more of the past 30 days) indicated that Native Americans have the highest use (12.1%), followed by Whites (8.3%), and Hispanics (6.1%). These alarming statistics suggest high rates of binge drinking for White, Blacks, Hispanics, and Native Americans ethnic groups. Whites are more likely than African Americans, Hispanics, and Asians to have an alcohol use disorder at any point in their life (Hasin, Stinson, Ogburn, & Grant, 2007). However, while African Americans have lower rates of use, abuse or dependence, they report more problems associated with drinking such as illness, injuries, and social and legal consequences (Zapolski, Pedersen, McCarthy, & Smith, 2014).

Studies have found that not only is there a high prevalence of alcohol and drug use in trauma patients, but also an association with race exists. For instance, a study was conducted at a California level I trauma center utilizing the trauma registry to examine those patients who died from traumatic injury. The study found that Hispanic and African-American patients as compared to White or Asian patients were more likely to test positive for drugs or alcohol (Demetriades et al., 2004). Moreover, the Hispanic and

African American patients who presented with alcohol and substances upon admission were more likely to die from a penetrating (gunshot or stab wound) trauma.

Understandably, research associated with race and alcohol use is meaningful. It seems important to assess how risky drinking differences may influence the intervention provided to patients of diverse backgrounds. For instance, if more violently injured White patients had significantly higher initial risky drinking AUDIT scores than Black patients, this finding may alert counselors to the potential high risk of this population. Also, if the risky drinking scores did not significantly change after a brief intervention, it may be appropriate to identify alternative or additional means to best address risky drinking for this group. However, a paucity of research has focused specifically on alcohol screening and brief intervention and race. Of those, the studies have provided inconclusive evidence to support any difference between race and intervention.

A 2009 randomized controlled trial examined the role of race in alcohol screening and brief intervention with trauma patients in an ED. The enrolled participants self-reported as White (45%), Hispanic (36%), or Black (19%). Each participant was randomly selected for an assessment only, specifically the CAGE, or a brief intervention. At the 12-month follow up, no relationship between race and brief intervention efficacy was found (Roudsari, Caetano, Frankowski, & Field, 2009). Moreover, no differences were noted between the assessment only group and the intervention group. Sommers et al. (2006) examined ASBI with trauma patients who were in a motor vehicle accident. The study showed that White participants were more likely to stay in the study with an attrition rate of 44% whereas African-American participants had a higher attrition rate of 67%. The authors purported that due to this difference in attrition rates, cultural

sensitivity is required.

Due to the limited studies regarding race and alcohol screening and brief intervention, it is relevant to continue studying race and brief interventions. These studies point to the need to continue to investigate race in order to provide multiculturally sensitive brief counseling. Also, it is well documented that racial disparities exist in access to substance abuse treatment, and ASBIRT can bridge that gap. For these reasons continued research associated with alcohol screening and brief intervention programs for minorities is paramount.

Age

The age of patients is important to consider when studying ABIRT because this approach offers more information about the populations with heightened risk for risky drinking habits. Research has found that alcohol use and related problems increase dramatically from age 12 to age 20 (Brown et al. 2008). Moreover, around the ages of 15-17 years, binge drinking increases and with it comes an increase in accidental death and injury (Hingson & Zha, 2009). In fact, trauma is the leading cause of injury and death among youth. Therefore, the World Health Organization (WHO), United States Surgeon General, the American Academy of Pediatrics (AAP), and the American Medical Association (AMA) have called to action the need for more screening, brief intervention, and referral for treatment (SBIRT) for adolescent drinkers (AAP, 2001; Elster & Kuznets, 1994; Heather, 2007) Yet, despite this initiative, most adolescents in the medical system do not receive these services (Fairbrother, Scheinmann, Osthimer, Dutton, & Newell, 2005).

Not surprisingly, risky drinking specifically increases youths' susceptibility to violent injury. In fact, youth are the most vulnerable population to violent injury. Youth violence is described as, "the intentional use of physical force or power, threatened or actual, exerted by or against children, adolescents or young adults, ages 10-19, which results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation" (Mercy, Butchart, Farrington, & Cerda, 2002, p. 36). Violence might include community violence, gang violence, dating violence, and bullying. Recent studies indicate that an individual's brain is not fully development until age 25; therefore, several studies categorize participants up to age 25 as youth. Youth that have sustained a previous violent injury have an approximate 20% chance of dying due to violence. Likewise, victims with previous violent injuries will have a 10% to 50% chance of being reinjured through violent means. Researchers believe that increased resources such as brief intervention can serve to support these youth and thereby reduce violent injury recidivism (Goins, Thompson, & Simpkins, 1992; Shibru et al., 2007).

According to the NIAAA, while youth drink less often, they drink more than adults, on average of five drinks in one setting, which constitutes binge drinking. Underaged drinking can significantly impact brain development as well as lead to other serious social, legal, and health consequences. One such consequence is violent injury. In a qualitative analysis, African American youth between the ages of 18 and 30 were interviewed after sustaining a violent injury. The study reported numerous negative consequences of violent injury. The researchers reported that at least two-thirds of the participants met the criteria for PTSD. Furthermore, the participants self-reported not

feeling safe, self-medicating with alcohol or drugs, and experiencing violence re-injury (Rich & Gray, 2005).

In recent years, youth violence has become a monumental concern in healthcare. Medical institutions have been encouraged to provide violence prevention and intervention into the medical care of youth. Also, views on youth violence have shifted from being viewed as a justice system problem to a medical issue (Cunningham et al., 2009). Accordingly, medical institutions such as emergency departments, trauma centers and primary care offices have taken action.

Studies have found that adolescents who are admitted to the ED and later trauma centers are more likely to engage in risky behaviors such as violence and alcohol use (Swahn & Dononvan, 2006; Walton et al., 2009). Research has indicated that brief interventions in trauma centers, specifically, can reduce and prevent the retaliation and traumatic injury recidivism specifically in youth **(**Cooper, Eslinger, Stolley, 2005; Cunningham et al., 2012; Walton et al., 2009**.** The first study of hospital trauma based violence-prevention programs concluded that it is indeed an effective means of reducing recidivism. However, this study did not include alcohol misuse as a contributing factor to violent injury (Cooper et al., 2005). In a randomized control trial conducted at an urban emergency department, the researchers found that a brief intervention with youth who reported alcohol use and violence in the past year was effective and feasible (Cunningham et al., 2009). Likewise, a similar study demonstrated that at a one year follow up, youth self-reported less peer violence after a brief intervention at a trauma center (Cunningham et al., 2012). However, in this study, alcohol use did not reduce for the youth. Another study, however, indicated a reduction in violence and alcohol use at a

six-month follow up (Walton et al., 2009). Study outcomes are indeed mixed when it comes to an intervention combining alcohol and violence intervention with youth. Because alcohol misuse is a risk factor for violent injury, it is important to examine alcohol reduction as it relates to an alcohol screening and brief intervention in the trauma setting. No study to date has examined the relationship between age and change in risky drinking after a brief counseling intervention for violently injured patients.

Quality of Life

Quality of life can be conceived as a protective factor for patients. It seems valuable to examine the differences in quality of life between violently and nonviolently injured risky drinkers for various reasons in order to identify baseline differences that can be utilized through brief counseling interventions. Presently, Quality of Life (QoL) does not have a commonly accepted definition (Laudet, 2011). QoL has been conceived of in many ways. Gill and Feinstein (1994), who conducted a critical appraisal of 75 articles to analyze the understanding of QoL by patients and medical professionals, found that QoL can be described as one's distinctive perception of personal feelings about health and nonmedical aspect (for instance, one's reaction to experiences with family members and friends and work). QoL is also characterized as "life satisfaction, achievement in social and professional roles, a sense of being productive, a sense of control over one's destiny, as well as a pleasurable and satisfying sense of existence and spiritual fulfillment" (Ware, 1976, p.406). Another definition is "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHOQOL Group, 1995, p.1405). At the very least, from a biomedical and social science perspective, it has been established that

QoL is one's subjective perspective of a wide array of clinical, functional, and personal elements (Bonomi, Patrick, Bushnell, & Martin, 2000).

Numerous studies have assessed QoL within medical systems, and it is recognized as an important aspect of patient well-being and care; however, despite the use of QoL in several healthcare fields, very few have studied QoL within the field of substance use (Foster, Powell, Marshall, & Peters, 1999; Laudet, 2011). Furthermore, of the few studies associated with substance use, only alcohol dependent populations have been studied. The few studies of QoL with dependent populations and those seeking treatment found that QoL is lower for them as compared to individuals without Substance Use Disorders (Donovan, Mattson, Cisler, Longabaugh, & Zweben, 2005; Smith and Larson, 2003). The same is true with other populations such as primary care patients and those with physical and mental health conditions (Laudet, 2011; Smith & Larson, 2003. However, no study to date has assessed risky drinkers or trauma patients with violent injuries.

The QoL variable can enhance understanding of patients and the quality of care. A patient's view of one's QoL is indeed significant because it offers a holistic view of wellness instead of the clinician's focus on merely symptoms. Also, a patient can provide unique insight that the clinician may not identify or view as important (Laudet, 2011). Also, according to Hunt and McKenna (1993), QoL is a powerful predictor of treatment-seeking behavior, retention, and treatment evaluation. Laudet (2011) posited that because of the complexity of substance abuse, which impacts one's entire functioning, it seems only natural to consider QoL as a means to see the big picture of substance abuse ill effects. There are many reasons why QoL is a powerful variable to study within addiction research and should thereby continue to be studied. For this study, it is valuable to

determine the differences in QoL between nonviolently and violently injured risky drinkers in a trauma center in an effort to provide the highest quality of care.

Summary

Chapter 2 presented a thorough review of the history of alcohol treatment to include brief counseling and interventions. An in-depth overview of brief interventions in the medical arena and trauma centers in particular was provided. Brief alcohol intervention with violently injured patients has been identified as a needed focus area of research. Further examination of predictors was discussed and identified as demanding consideration in researching brief interventions. This study adds to the research by examining the violently injured population who receive brief alcohol counseling intervention efficacy. Likewise, the predictors of violently injured patients also warrant further research, thus enhancing the understanding of those factors influencing the change in risky drinking following an alcohol screening and brief counseling intervention.

CHAPTER III: METHODOLOGY

This chapter will focus on the research methodology. This study was a retrospective analysis utilizing archival data from a randomized clinical trial. Archival data is defined as previously gathered information that can be utilized for research purposes (Jones, 2010). The study's archival data is based on the original study, the *Teachable Moment (TM)* Study. The aim of the *TM* study was to investigate the efficacy of two types of brief counseling interventions. This chapter provides an overview of the study's participants, procedures and design, instrumentation, data analysis and summary.

Participants

The participants of the study were all adult patients admitted to a Level I trauma center at a southeastern US hospital from January 5, 2009 to June 20, 2011. All trauma patients 18 years or older, male or female of all races, admitted to the trauma center (non-ICU) who met the prescreening criteria for risky drinking, were eligible for enrollment into the study. The sample consisted of male participants (N = 272; 81.7%) and female participants (N = 61; 18.3%). Race was predominately White (72.7%) with African-American (21%), Latino (5.4%), and American-Indian (0.9%) participants. Eighty-three percent of the traumas were blunt injuries and 17% were penetrating injuries. Of the admitted trauma patients, 2,136 patients were assessed for eligibility; of those, 1,629 patients did not meet inclusion criteria. Of the 507 eligible patients, 333 (65.7%) consented to be part of the study and were enrolled.

Inclusion Criteria.

Those participants who met the inclusion criteria for the TM study had the following characteristics: (a) admitted to the inpatient trauma service; (b) were 18 years or older; (c) spoke English or Spanish; (d) had a positive answer to the prescreen questions, and/or had a positive blood alcohol level (BAL of 80 ml/dg or higher); and (e) had a positive AUDIT score (men ≥8; women ≥4). The trauma service draws blood as part of standard protocol. During the hospital admission process, all the trauma patients were asked two questions. The first question was "How many drinks do you have on a typical day when you are drinking?" A positive answer for women is drinking 4 or more drinks per day and 5 or more drinks per day for men (NIAAA, 2010). The second question was "How many days per week are you drunk?" A positive response is drinking greater than one day per week. The counselors obtained the AUDIT scores during the counseling intervention.

Exclusion Criteria.

Patients were not included in the study for several reasons. The patients excluded from the study were: (a) patients that refused contact at the six month follow up call; (b) patients who had a positive blood alcohol level and negative AUDIT score; (c) those who were determined unable to complete the brief intervention based on the counselor's clinical decision which might include low consciousness (i.e. Glascow Coma Score less than 12—this is a scale commonly used in trauma centers to assess medical and mental status), medication or psychiatric condition; (d) those who did not speak English or Spanish); and (e) those that did not meet the prescreening criteria. Further exclusion for the current study included those who did not complete the six month follow up AUDIT assessment.

Procedures and Design

For the original study, all the trauma patients were screened based on the inclusion criteria. The TM study was a randomized clinical trial of two brief counseling interventions. If a patient consented to the study, the patient was randomly assigned into one of two interventions. One brief intervention was quantity-frequency brief counseling intervention based on the NIAAA model of reducing standard alcoholic drink consumption to low-risk levels. The counselor explored the patient's current drinking level, provided suggestions to minimize alcohol use, and collaboratively discussed the patient's thoughts regarding change. Of the 333 patients enrolled, 167 were assigned to the quantity/frequency arm. The second intervention was the qualitative brief counseling which explored subjective drunkenness, reasons given for drinking at high risks, and possible changes to reduce risky drinking. In short, the qualitative intervention involved more of the patient's perception of his/her drinking and less about the amount of alcohol consumption. One hundred and sixty-six patients were assigned to the qualitative arm. Both interventions were on average 29 minute sessions. However, the quantity-frequency intervention was significantly lower at 27.5 minutes than the qualitative intervention at 31 minutes per session. The interventions also had common elements. For instance, both highlighted injury risk due to alcohol use and the patient's individual responsibility to change, provided information about the patient's screening (AUDIT score) results, and discussed the patient's perspective on alcohol use and alcohol use goals. Those patients who declined to be in the study were not enrolled, but were offered the NIAAA quantity-frequency counseling intervention which met the hospital's current standard of care

protocol. All enrolled patient interventions were randomly taped and reviewed by the study team to insure fidelity.

The researcher then enrolled the patient into one of the two interventions based on the selection information contained within an envelope. At six months, the participants received a follow-up call. The follow-up included facilitating the AUDIT and asking two questions. The first question was, “How successful have you been making changes with your drinking?” The self-reported answer was scored on a five-point Likert scale, one being “not successful at all,” and five being “totally quit/major change.” The second question asked the patient to self-report his/her quality of life at the six-month follow up. (O’Brien, et al., 2012). The question was, “On a scale of 1-10, how well is your life going at this time?” This answer was also in Likert format, one being “terrible” and ten being “extremely well”. (See Appendix D.) The below diagram illustrates the Teachable Moment study procedures:

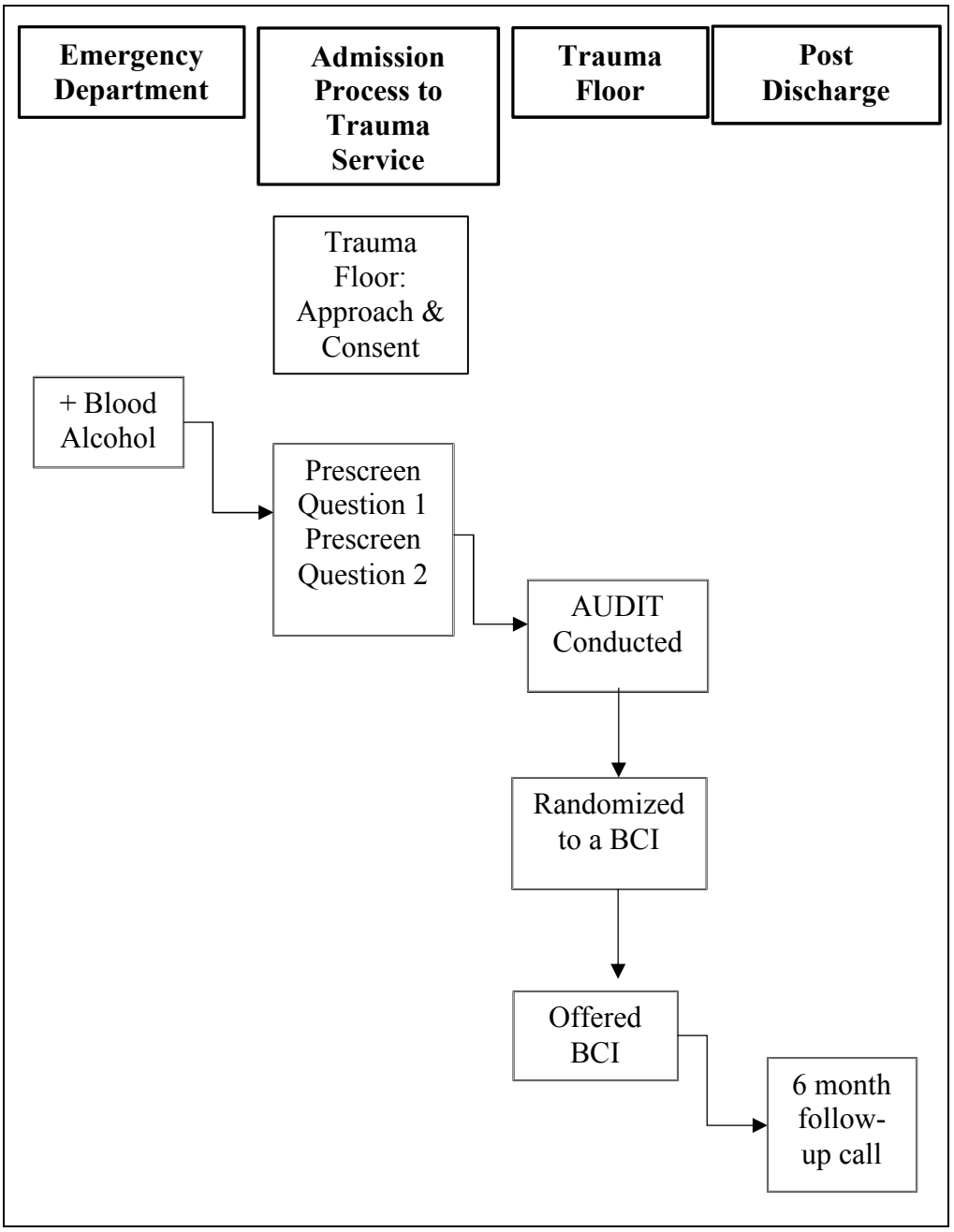

Figure 1: The *Teachable Moment* study procedure

Current Research Design

The current research study utilized the dataset from the original randomized clinical trial study. Within this dataset, the participants are unidentifiable in order to

comply with HIPAA and the IRB guidelines. Once IRB approval was obtained for the study, a new dataset was generated within Statistical Package for Social Science (SPSS) with the participants. All patient information from the *TM* study is unidentifiable and is unknown to the researcher. A new dataset utilizing Statistical Package for Social Science (SPSS) computer software was generated to analyze the data.

Instruments

The Alcohol Use Disorders Identification Test instrument was used to identify risky drinking and the change in risky drinking behaviors. The AUDIT contains ten questions with three conceptual domains: risk factors, drinking consequences, and drinking attitudes (Babor et al., 2001). The items are on a five-point Likert scale of 0-4 with zero being "never", 1 being "less than monthly", 2 being "monthly", 3 being "weekly", and 4 "daily or almost daily" denoting how much one consumes alcohol. The AUDIT manual offers score guidelines. It indicates that total AUDIT scores ranges from 0-40. Scores less than 8 are considered low-risk levels of drinking. Scores between 8 and 15 are considered risky drinking or harmful use. Lastly, scores of 16 through 19 indicate a need for continued monitoring. The highest scores from 20 to 40 warrant more intensive evaluation for alcohol dependence (Babor et al., 2001). However, clinical judgment may be made when following the AUDIT guidelines associated with cut-off scores. Different scores may be used for various populations; in the case of the *TM* study for women the cut of score was a 4. A review of scoring for women with several alcohol assessments (AUDIT, CAGE, MAST, and TWEAK) found that a score of 4 is appropriate for women (Bradley, Boyd-Wickizer, Powell, & Burman, 1998).

The AUDIT has high validity with a correlation coefficient of .78 as compared to

the CAGE (Saunders et al., 1993).The AUDIT also is considered reliable with high internal consistency (Fleming, Barry, & MacDonald, 1991; Hays, Merz, & Nicholas, 1995; Sinclair et al., 1992). According to Sinclair et al. (1992), the test-retest reliability was found to be high (r = .88). Sensitivity and specificity are defined as an instruments measurement of power to accurately predict (Tabachnick & Fidell, 2007). In other words, sensitivity is the measure of the proportion of positives accurately identified and specificity is the measure of the proportion of negatives accurately identified. In the testing stage, Babor et al. (2001) reported The AUDIT's sensitivity as in the .90's and the specificity in the .80's in various criteria and worldwide. The AUDIT has been studied in the medical setting for sensitivity and specificity. In a 26 study review, Reinert and Allen (2007) examined the outcomes of several studies that assessed the AUDIT's criterion validity—defined as a measure of validity based on the strength of the relationship between scores on the instrument and an independent criterion that is an accepted standard against which the instrument may be compared. One of the studies review, Kelly et al. (2004) researched emergency department patients and compared the AUDIT, the CAGE, the CRAFFT, and a modified RAPS-QF. The AUDIT was reported to have the best sensitivity at .87 and specificity at .65, PPV at .60, NPV at .88 and AUC at .85. This indicates that the AUDIT is an accurate screening of harmful alcohol use.

From a cultural perspective, its validity has been tested among various ages, genders, and cultures. In fact, it has been translated into several languages (Babor et al. 2001). Likewise, with other groups, such as women, adolescents, various ethnic and psychiatric groups, the AUDIT was found to be statistically sound (Carey, Carey, & Chandra, 2003; Knight et al., 2003; Reinert & Allen, 2007).

This instrument was specifically designed for the medical setting (Babor et al., 2001). Several studies of the AUDIT have been conducted within healthcare systems. In the primary care setting, a correlation coefficient of .78 between the CAGE and the AUDIT was found (Babor et al. 2001). Similarly, Bohn, Babor and Kranzler (1995) found a strong correlation between the AUDIT and the Michigan Alcohol Screening Test (MAST; r= .88). Likewise, several studies in the emergency and trauma setting have evaluated the AUDIT (Cherpitel, 1998; Donovan et al., 2005). It has also been found to be consistent with ICD codes for harmful alcohol use and dependence (Allen et al., 1997; Cherpitel 1995; Conigrave, et al., 1995).

The AUDIT is a previously established instrument for studying risky drinking in the medical setting and thus is appropriate for use in this study conducted in a trauma center. Additionally, a few prediction studies have also utilized the AUDIT, and this research adds to the suitable nature of this assessment for a retrospective study such as this one (Desy, Howard, Perhats, & Li, 2010; Goodall et al., 2007; Walton et al., 2009).

In the current study, the construct of resistance was measured using an evaluation that was completed by counselors following the initial brief counseling intervention. The evaluation was created by the Teachable Moment Study principal investigators (PIs). This is the first time this specific instrument has been used in research, but it is similar to previous research (Magill et al., 2010). This study's evaluation has two Likert scale items, ranging from 1-5. One represents little to no resistance and 5 represents very high resistance. The first item, "*patient resistance at beginning of brief intervention"* was used to measure the extent to which resistance is a risk factor for violently injured patients (see Appendix E). Also, the second item, "*patient resistance at the end of brief intervention*"

also was examined. (see Appendix E). The counselors providing brief counseling interventions were trained by the PI to ensure inter-rater reliability, which is a measure of reliability used to evaluate the degree to which raters agree in assessment decisions (L. Veach, personal communication, 2016). This instrument, however, is limited due to self-report of patient resistance by the counselor. Thus the raters may differ in the assessment of resistance thus creating variability in the analysis and lower inter rater reliability.

The construct of quality of life also was measured by using the *Teachable Moment study* evaluation question asked at the six month follow up. The question asked, "On a scale of 1-10, how well is your life going at this time?" The question is on a Likert scale from 1 to 10, one being terrible to 10 being extremely well (see Appendix D). any reliability data?

Type of violent injury was measured by the mechanism of violent injury which was found within the medical records and recorded in the TM study dataset. It is categorized as: stabbing, gunshot, or assault. Furthermore, one pedestrian struck case was identified within the medical record as violent in nature. This case was categorized in the analysis as violently injured. Race and age were also both self-reported by the patient upon admission and found within the medical record. For the purposes of this study, participants were classified as white and all nonwhite because of the small number of participants from African-American, Hispanic, and Asian participants. Insurance status was determined by the primary insurance category within the TM study dataset. Urine drug screen was determined by two or positive more drugs found within the medical records.

Statistical Analysis

This study examined the differences in the AUDIT item responses and the change in risky drinking between violently and nonviolently injured patients after a brief counseling intervention. The study also aimed to identify the differences in resistance, quality of life, insurance status, drug use, type of violent injury, race and age among these two groups. Additionally, the study sought to identify how resistance, insurance status, drug use, type of violent injury, race and age predicted risky drinking habits and change in risky drinking of violently injured patients.

The research questions were as follows:

(1) What is the difference in the initial AUDIT item responses between violently injured patients and nonviolently injured patients?

(2) What is the difference in violently injured patients' and nonviolently injured patients' change in risky drinking from the initial intervention to the 6-month follow up?

(3) What is the difference in counselors' evaluation of resistance, quality of life at the 6-month follow up, insurance status, urine drug screen, race and age between violently injured and nonviolently injured patients?

(4) To what extent do counselors' evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age of violently injured patients predict risky drinking at the initial intervention?

(5) To what extent do counselor evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age of violently injured patients predict change in risky drinking from the initial intervention to the 6-month follow up?

In order to answer the research questions noted above, four analyses were selected. This study intended to use t-test, chi square test, Repeated Measures Analysis of

Variance (ANOVA), and Simultaneous Linear Regression for the data analysis (Tabachnick & Fidell, 2007). However, the Linear Regression was not employed due to lack of significance in the correlations. The analyses selected for each question will be discussed in detail.

In the first research question, the criterion variable is the AUDIT item responses (n = 333). A t-test was selected to analyzed The AUDIT responses individually between nonviolently injured and violently injured patients. A t-test is designed to compare whether two groups have different means (Tabachnick & Fidell, 2007). In the case of this study, the purpose of this test is to determine if any difference in the means exist between these two groups. For instance, violently injured patients may score higher on specific AUDIT questions than do nonviolently injured patients.

In the second research question, the criterion variable is the initial assessment of risky drinking for both the violently and nonviolently injured groups. A two-way Repeated-Measures Analysis of Variance was utilized for the second research question. The purpose of an ANOVA is to see if any mean difference exists between groups on some variable (Tabachnick & Fidell, 2007). In other words, the ANOVA was conducted to compare the initial total AUDIT score at the bedside with the six month follow up scores between the violently injured and nonviolently injured patients. For the follow up cases, the total cases analyzed was 181 because 152 cases were not reached by phone during the follow up calls. This analysis is important because it may show a significant difference in the change in risky drinking between the two groups.

The third research question's criterion variable is the counselors' evaluation of resistance, quality of life, insurance status, urine drug screen, race and age. A t-test

analysis was used for the third research question. The objective of this t-test is to analyze the mean differences between these two groups. It was utilized to analyze the difference in counselors' evaluation of resistance, quality of life, insurance status, urine drug screen, race and age between violently injured and nonviolently injured patients. This was important to establish to what extent there are baseline differences between these two groups. For instance, the violently injured group may have a lower quality of life and higher resistance. All 333 cases were analyzed. The nonviolently injured group cases total 263. The violently injured group cases total 73. Seventy-two cases met the retrospective analysis criteria of a reason for hospitalization being violent in nature: sexual assault, non-sexual assault, assault involving intimate/domestic partner, stab wound, or gunshot wound. Additionally, one pedestrian struck case was reviewed and found to be violent in nature. The participant was intentionally struck by another person which constitutes violent injury per the definition. The decision was made based on this information to add this case to the violently injured group. The remaining cases were nonviolent in nature, namely, motor vehicle accidents, falls, motorcycle/bike/ATV accidents, or pedestrian struck.

The predictor variables in the fourth research questions are counselor evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age of violently injured patients. Simultaneous Linear Regression analysis was conducted for the fourth research question. In this type of analysis, the variables are treated simultaneously and are on an equal footing. This is appropriate when there is no logical reason for one variable to be considered before another one (Tabachnick & Fidell, 2007). This is the case with these variables. The dataset has a total sample of 333, and of those,

73 cases selected by the reason for hospitalization were analyzed in the Simultaneous Linear Regression analysis for the violently injured patients. By utilizing regression in this study, the predictor variables of counselor evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age were examined to determine the relationship between them and the initial AUDIT score (risky drinking). This form of analysis offers a clearer understanding of the potential predictive value of risky drinking behaviors for violently injured individuals. In essences, it can serve as a baseline. For example, those with higher resistance may have higher risky drinking behaviors as indicated in the AUDIT scores. Patients with higher urine drug screens may have higher AUDIT scores.

The fifth research question also employed a Simultaneous Linear Regression analysis. The predictor factors are the same as in question 4: counselor evaluation of resistance, insurance status, urine drug screen, type of violent injury, race and age. Seventy-three cases were analyzed. This question addressed the violently injured group's predictive variables impact on the change in risky drinking from the initial counseling intervention and the 6 month follow up. For instance, might having no insurance and high resistance predict less of a change in risky drinking behaviors in those that are violently injured.

Screening

Prior to looking for any significance in the dataset, the data was screened for each analysis. For the t-test and ANOVA, the dataset was run to check for significant outliers, normality of the distribution, and homogeneity of variance. Sphericity was also considered for the ANOVA. For Simultaneous Linear Regression, data was assessed for

accuracy in data entry, outliers, missing values, and distribution normality. In order to meet the assumptions of Simultaneous Linear Regression, multicollinearity, homoscedasticity, and linearity was addressed (Tabachnick & Fidell, 2007).

Summary

This study conducted a retrospective analysis from a three-year randomized clinical trial, *The Teachable Moment* Study. The purpose of the study was to determine if differences exist in the AUDIT item responses and the change in risky drinking (total AUDIT score) between violently injured patients and nonviolently injured patients. Also, the study sought to determine the differences between counselors' evaluation of resistance, quality of life, insurance status, urine drug screen, race and age between violently injured and nonviolently injured patients. Lastly, the research sought to identify how much counselors' evaluation of resistance, insurance status, urine drug screen, type of violent injury race and age of violently injured patients predict risky drinking and change in risky drinking.

CHAPTER IV: DATA ANALYSIS AND RESULTS

This study was designed to examine (a) the difference in the AUDIT item responses between violently and nonviolently injured patients, (b) the difference in the change in risky drinking between the two groups, (c) the differences in several risk factors between the two groups, (d) the predictive nature of these risk factors' impact on risky drinking of violently injured patients, and (e) the predictive nature of these risk factors that may influence the change in risky drinking for violently injured patients. This study used data from a retrospective analysis from the original study, *The Teachable Moment*, conducted from 2009 to 2011 and funded by the Robert Wood Johnson Foundation. Chapter 4 offers, first, a description of the participants through an examination of the descriptive statistics, operationalization of the variables, followed by the screening, analysis and the results for each research question. The chapter will end with a summary.

Description Statistics of the Participants

The demographics for the participants will be addressed by research question. Research questions one and three included all the participants enrolled in the *TM* study. The total sample of enrolled patients was 333 who received a brief counseling intervention. The mean age of the patients was 37 years of age. The baseline demographics were majority White (72.7%), with 20.8% African-American, 5.4% Latino, and 0.9% Native American, with 81.7% male. Positive drug screen upon admission to the hospital for the total sample was 70.6% (n = 228). Thirty-two percent of

the drug screens were missing from the total sample (*n* = 333) which could skew this data. The mean blood alcohol level (BAL) was .162 (*n* = 248). However, there were 8.7% missing BALs which may skew this information as well. A summary of this information is presented in Tables 1 and 2.

Table 1*: Descriptive statistics of the total TM study participants*

	N = 333	
Gender	*n*	%
Male	272	81.7
Female	61	18.3
Race		
White	242	72.7
Nonwhite	91	35.4
Positive Urine Drug Screen	161	48.3
Negative Urine Drug Screen	67	20.1
Missing Urine Drug Screen	105	31.5
Positive Blood Alcohol Level	198	59.5
Positive Nurse Screen Question	275	82.6

Table 2: *Descriptive statistics of age and blood alcohol level (n = 333)*

	n	Minimum	Maximum	Mean	SD
Age	333	18	71	37.04	12.61
BAL	248	.005	.448	.162	.089

Whereas the second research question sought to compare all the participants, not every participant followed up at six months. Thus, this sample only included those who completed the follow up assessment. The sample of patients who completed follow-up telephone interviews included 181 participants (54%). This sample consisted of 149 males (82.3%) and 32 females (17.7%). The race of the participants was 77.3% White (n=140), 19.3% African- American (n=35), and 3.3% Latino (n=6), 1.4% Native American (n=1). The mean age of this sample was 39 years, with participant ages ranging from 18 to 71 years (SD=13.3). These demographics are presented in Table 3. A

descriptive comparison between the violently and nonviolently injured patients is presented below in Table 4. The mean BAL was .162 with a range from .05 to 448 (SD =.089) for the total follow up sample. A comparison in age and BAL between the violently injured and nonviolently injured groups is provided in Table 4.

Table 3*: Descriptive statistics for participants at 6-month follow up*

	N=181	
	n	%
Gender		
Male	149	82.3
Female	32	17.7
Race		
White	140	77.3
Nonwhite	41	22.6
Positive Urine Drug Screen	87	48.1
Negative Urine Drug Screen	35	19.3
Missing Urine Drug Screen	59	32.6
Positive Blood Alcohol Level	103	56.9
Positive Nurse Screen Question	155	85.6

Table 4: *Descriptive Statistics for violently injured vs. nonviolently injured patients (n =181)*

	Injury					
	Violent			Nonviolent		
	M	*SD*	*n*	*M*	*SD*	*n*
Age	38.16	8.80	32	39.05	14.10	149
BAL	.176	.109	24	.159	.084	103

The fourth and fifth research questions of the current study focused only on the violently injured patients who were hospitalized for a traumatic injury at a level I trauma center. Of the 333 participants, 72 were determined by reason for hospitalization to be violently injured. The patients were 93.2% male and 6.8% female with a mean age of 37 years. The baseline demographics included White (48%); African-Americans (41.1%);

Latino (9.6%); and Native American (1.4%). The majority of the patients had penetrating injuries (i.e., gunshot or stabbing) and the remainder had blunt injuries (i.e., assault). A table is provided below. The violently injured patients sustained gunshots wounds (35.6%), stab wounds (32.9%), assaults (30.2%) and intentional pedestrian struck (1.4%).

Table 5: *Descriptive statistics of violently injured patients*

	N=72	
	n	%
Gender		
Male	68	93
Female	5	6.8
Race		
White	35	48
Nonwhite	38	52
Type of Injury		
Penetrating (gun/stab)	51	70
Blunt (Assault)	21	29

Operational Definitions of Variables

Each variable was operationally defined according to each analysis conducted. The first three questions examined the violently injured as compared to the nonviolently injured whereas, the last two research questions examined only the violently injured participants. Therefore, for the first three questions, coding was required to differentiate the two groups (violent vs. nonviolent).

Coding for research questions one and two

The AUDIT item responses are continuous variables and were entered for analysis. The two groups, violently injured and nonviolently injured, are dichotomous variables and required coding in order to conduct the analysis. The variable labeled "reason for current hospitalization" from the TM study was selected to determine the nature of the injury, either violent or nonviolent. All variables coded penetrating

(gunshot/stabbing) and blunt (assault) from the TM study were coded as violently injured. All the variables coded as automobile accident, motorcycle accident, bicycle accident, moped accident, all-terrain vehicle accident, fall, pedestrian struck (to exclude one case which was deemed a violent injury according to the chart), burn, and other serious injury, were coded as a nonviolent injury. The categorical variables of violently injured groups and nonviolently injured groups were then coded dichotomously (1= violently injured, 2=nonviolently injured). Also, for research question two, the total AUDIT scores from the initial intervention at the bedside and the six-month follow up are continuous in nature and were entered for analysis.

Coding for Research Questions Three, Four and Five

Resistance, quality of life, and age were continuous variables and were entered and run for analysis. In order to conduct the analysis, the dichotomous urine drug screen, insurance status, and race were coded. Urine drug screen was coded as (0 = negative, 1 = positive). Insurance status was coded by (no insurance, self pay, or public insurance = 0, commercial/private = 1, other: VA, victim compensation, or worker's compensation = 3). Race was coded as white or nonwhite (White = 0, nonwhite = 1). For research question number three, the violently and nonviolently injured patients were divided the same as above in research questions one and two (1= violently injured, 2=nonviolently injured). Injury type, as a dichotomous variable, was coded as (Assault [blunt] = 0, Gunshot/stabbing [penetrating] =1). For research question four, the variable of risky drinking was continuous with scores that can range from 0-40 according to the AUDIT scoring range. For research question number five, a new variable was added for the change in risking drinking. An equation for the difference in AUDIT scores at the initial

intervention and the AUDIT scores at the six-month follow up was generated and coded as the change in risky drinking. These scores were continuous variables and were entered and run in SPSS.

Screening and Results by Research Question

Prior to running the analyses, the data were screened using the Statistical for the Social Sciences (SPSS). The data were first screened for each research question. The first second, and third research questions were screened for outliers, missing data, normality, and homogeneity of variance. The continuous variables (i.e., AUDIT item responses, total AUDIT scores, resistance, quality of life, and age) were examined for normal distribution. The second research question was also screened for linearity in accordance with an ANOVA analysis. The fourth and fifth research questions were screened for normality, missing data, outliers, linearity, homoscedasticity of residuals, and multicollinearity.

Research Question One: Screening and Results

There were no missing cases for research question 1 (n = 333). The continuous variable, AUDIT item responses, were examined for normal distribution. According to the Kolmogorov-Smirnov and Shapiro-Wilk, the AUDIT item responses are not normality distributed because p is significant ($p < .001$). The skewness and kurtosis for the AUDIT item responses were also examined and found to not be normally distributed. However, it is important to mention that the AUDIT items 1, 3, and 7 were normally distributed. The means, standard deviations, skewness, and kurtosis are presented in Table 6. The variable AUDIT item response was inspected for outliers. The initial AUDIT item number eight had six outliers. Three of the cases were AUDIT scores of

three and three cases were scores of four. The outliers were kept in the analysis because they were not identified as errors. The AUDIT item responses were also inspected for homogeneity of variance and this assumption was met ($p > .05$) with the exception of AUDIT item number 6 ($p = .028$).

Table 6: *Data screening of AUDIT item responses*

	M	SD	Range	Minimum	Maximum	Skewness	Kurtosis
AUDIT 1	2.83	1.01	4	0	4	-.36	-.92
AUDIT 2	2.16	1.37	4	0	4	.06	-1.29
AUDIT 3	2.33	1.16	4	0	4	-.36	-.74
AUDIT 4	.78	1.24	4	0	4	1.46	.85
AUDIT 5	.57	.99	4	0	4	1.93	3.01
AUDIT 6	.54	1.16	4	0	4	2.13	3.18
AUDIT 7	1.12	1.31	4	0	4	1.01	-.22
AUDIT 8	.80	1.01	4	0	4	1.40	1.42
AUDIT 9	1.98	1.93	4	0	4	.02	-1.94
AUDIT 10	2.10	1.91	4	0	4	-.10	-1.91

Research Question 1: T-Test Results

An independent samples t-test was conducted to compare each individual AUDIT item response between the violently and nonviolently injured patients. Because the homogeneity of variance was met for all but AUDIT item number 6, the assumed columns were reported from SPSS accordingly. However, item number 6 was not assumed and therefore the equal variance not assumed SPSS column was reported. Also, the Bonferroni correction was used to reduce Type I error.

There was not a significant difference in any of the individual AUDIT item responses between the violently and nonviolently injured groups. These results suggest that type of injury, violent or nonviolent, does not have an effect on the individual AUDIT item responses. Table 7 presented below illustrates these findings. For instance, there was not a significant difference on AUDIT item seven between the violently

(M=.97, SD=1.29) and nonviolently injured (M=1.16, SD=1.32) groups [t(331)= -1.09, p = .92] nor in AUDIT item nine between the violently (M=1.64, SD=1.93) and nonviolently injured (M=2.07, SD=1.93) groups, [t(331)= -1.63, p = .88]. The results are presented in Table 7 below.

Table 7: *Results of t-test for the initial AUDIT item responses by violent vs. nonviolent injury*

	Injury						95% CI for Mean Difference	t	df
	Violent			Nonviolent					
	M	SD	n	M	SD	n			
AUDIT 1	2.90	.96	73	2.80	1.02	260	-.16, .36	.75	331
AUDIT 2	2.30	1.40	73	2.12	1.36	260	-.18, .54	.98	331
AUDIT 3	2.47	1.04	73	2.29	1.19	260	-.13, .48	1.13	331
AUDIT 4	.81	1.31	73	.78	1.22	260	-.29, .36	.19	331
AUDIT 5	.53	.96	73	.58	1.00	260	-.30, .22	-.33	331
AUDIT 6	.68	1.32	73	.50	1.10	260	-.15, .53	1.12	331
AUDIT 7	.97	1.29	73	1.16	1.32	260	-.53, .15	-1.09	331
AUDIT 8	.78	1.13	73	.81	.98	260	-.29, .24	-.20	331
AUDIT 9	1.64	1.93	73	2.07	1.93	260	-.93, .08	-1.67	331
AUDIT 10	1.78	1.87	73	2.19	1.92	260	-.91, .09	-1.63	331

* $p < .05$.

A paired-samples t-test was also conducted to evaluate each AUDIT item responses at the initial assessment compared to the 6-month follow up AUDIT item responses. The results indicated that the mean score for the 6-month follow up AUDIT item responses were significantly less than the initial AUDIT item responses. For instance, the AUDIT item 1 at the 6-month follow up (M =1.52, SD = 1.37) was significantly less than the initial AUDIT item responses (M = 2.90, SD = .29), t(180) = 12.54, p =.05. The standardized effect size index, d was 1.29. The 95% confidence interval for the mean difference between the two ratings was 1.16 and 1.59. AUDIT items responses 1 through 3 and 6 had a moderate to large effect size. The results are presented in Table 8.

Table 8: *Results of t-test for the AUDIT item responses from the initial to the 6-month follow up*

	Initial AUDIT		AUDIT at 6-month follow up			95% CI for Mean Difference			
	M	*SD*	*M*	*SD*	*n*		*d*	*t*	*df*
AUDIT 1	2.90	.29	1.52	1.37	181	1.16, 1.59	1.29*	12.54*	180
AUDIT 2	2.17	1.33	.73	1.05	181	1.23, 1.66	.97*	13.05*	180
AUDIT 3	2.36	1.19	.93	1.28	181	1.22, 1.65	.97*	13.08*	180
AUDIT 4	.80	1.26	.17	.68	181	.42, .83	.05	6.04*	180
AUDIT 5	.52	.91	.14	.64	181	.22, .54	.05	4.76*	180
AUDIT 6	.48	1.08	.12	.66	181	.20, .52	.34*	4.46*	180
AUDIT 7	1.13	1.31	.36	.87	181	.56, .98	.20	7.29*	180
AUDIT 8	.77	.99	.22	.71	181	.39, .72	.16	6.69*	180
AUDIT 9	1.83	1.93	.11	.65	181	1.43, 2.01	.12	11.86*	180
AUDIT 10	2.08	1.94	.73	1.55	181	1.02, 1.68	.17	8.03*	180

* $p < .05$.

Research Question Two: Screening and Results

For research question two, only one hundred and eighty-one participants were reached for the followed up at six months, of which there were 73 violently injured cases and 149 nonviolently injured cases. The initial AUDIT total scores were then screened for outliers and one was identified, (initial AUDIT = 37). However, five outliers were identified in the 6-month follow up AUDIT scores. The cases' scores ranged from 24-35. The outliers were kept in the analysis because they were not identified as errors and seemed reasonable because they were within the AUDIT score range. The continuous variables of the total AUDIT scores were examined for normal distribution. The Kolmogorov-Smirnov and Shapiro-Wilk indicated that the total AUDIT scores were not normality distributed ($p < .001$). The Levene's test was used to inspect for homogeneity of variance of the AUDIT total scores. This assumption was met ($p > .05$). The

Geenhouse-Geisser was utilized to interpret the results.

Research Question 2: ANOVA

A repeated measures ANOVA was conducted to compare risky drinking at the initial intervention and the 6 month follow up between violently and nonviolently injured patients. The means and standard deviations are presented in Table 9.

Table 9: *The AUDIT scores between violent and nonviolent injury*

	Injury					
	Violent			Nonviolent		
	M	*SD*	*n*	*M*	*SD*	*n*
Initial AUDIT	13.81	7.88	32	15.23	7.95	149
6-Month AUDIT	5.84	7.23	32	4.82	6.16	149

There was not a statistically significant interaction between the violently and nonviolently injured patients in the change of risky drinking from the initial brief counseling intervention to the 6-month follow up, $F(1,179) = 1.90$, $p = .17$, partial eta = .853. In other words, there was not a statistically significant difference in the change of AUDIT scores from first to the second assessment between the two groups. However, the AUDIT scores reduced significantly among the entire group. It follows that there is a significant change in total AUDIT scores (risky drinking) from the initial brief counseling intervention at the bedside to the six month follow up, $F(1,179) = 107.33$, $p < .05$ partial eta squared = .38. The scores reduced for each group, respectively. Table 10 summarizes the results of the repeated measures ANOVA analysis.

Table 10: *Repeated measures analysis of variance between violent and nonviolent injury*

Effect	*MS*	*Df*	*F*	*P*	Greenhouse_Geisser	Huynh-Feldt
AUDIT Scores (initial and 6th month)	4451.92	1	107.33	<.00	<.000	<.000
Audit Score x injury type	78.89	1	1.90	.170	.170	.170
Error	41.48	179.00				

Research Question Three: Screening and Results

For research question three, the continuous variables of resistance, quality of life, and age were checked for normality with the Kolmogorov-Smirnov and Shapiro-Wilk. The test indicated that the assumption of normality was not met, *(p* > .05).

Table 11: *Normality of Distribution (n = 333)*

	M	SD	Range	Minimum	Maximum	Skewness	Kurtosis
Resistance 1	2.22	1.10	4	1	5	.55	-.59
Resistance 2	1.75	.93	4	1	5	1.13	.54
Age	37.04	12.6	53	18	17	.325	-.70
Quality of Life	6.95	2.56	9	1	10	-.58	-.39

The missing cases were as follows: the resistance variable had two missing cases and positive urine drug screen variable had 59 missing cases (32.6%). In an effort to replace the missing values, the MCAR's test was conducted and found to be significant (p = .05). This finding indicated that the cases were not missing at random. Therefore, imputation was not utilized with these missing cases. Four outliers were identified for resistance question number two. Three cases were a score of a four and one case was a

score of five. The assumptions of homogeneity of variance was met for the resistance and quality of life variables. The assumed column was reported below in Table 11. Whereas with the variables of insurance status, age, and race, assumptions were not met, therefore the not assumed column was reported below. Due to multiple comparisons, the Bonferroni correction was utilized for the significance level.

Research Question 3: T-Test & Chi Square Test

A t-test was conducted to determine differences in the factors of resistance, quality of life and age between violently and nonviolently injured patients. For the categorical variables, Chi squared test was employed to determine the differences in insurance status, race and urine drug screen with the significance level set at p=.005 based on the Bonferroni correction for multiple comparisons.

The t-test found that the factors of resistance are not significantly different between violent injury (M = 2.27, SD = 1.13) and nonviolent injury (M = 2.21, SD = 1.09), t(329) = .45, $p > .05$. The age of the patients was also not significantly different between violent (M = 37.05, SD = 9.26) and nonviolent injury (M = 37.03, SD = 13.42), t(331) = 4.95, $p > .05$). Lastly, quality of life was also not significantly different between the two groups, violently injured (M = 6.75, SD = 2.95), and nonviolently injured, (M = 6.99, SD = 2.48), t(180) = -.47, $p > .005$). Table 12 presents the results.

Table 12: *Results of t-tests by violently injured or nonviolently injured*

Outcome	Group						95% CI for Mean Difference		
	Violently			Nonviolently					
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	df
Resistance 1	2.27	1.13	73	2.21	1.09	258	-.22,.35	.45	329
Resistance 2	1.82	.99	73	1.73	.92	258	-.15,.34	.76	329
Quality of Life	6.75	2.95	32	6.99	2.48	149	-1.2,.75	-.47	179
Age	37.05	9.26	73	37.03	13.42	260	.19,.44	.01	331

* $p < .05$.

According to the Chi squared test, there is a significant association between race and the type of injury, violent and nonviolent, χ^2 (df =2, n = 333) = 28.79, p < .01. For the white patients, 14.5% were violently injured and 85.5% were nonviolently injured. Of the nonwhite patients, 41.8% were violently injured and 58.2% were nonviolently injured. Cramer's V is .29 which is viewed as a medium effect.

Likewise, there is a significance association between insurance status and the type of injury, violent and nonviolent, χ^2 (df =3, n = 333) =13.68, p < .01. Twenty-eight percent of the patients with no insurance were violently injured and 72.2% were nonviolently injured. Of the patients with commercial insurance, 10.5% were violently injured and 89.5% were nonviolently injured. Of those patients with Veteran's Assistance or Worker's Compensation, 8.8% were violently injured and 91.2% were nonviolently injured. Cramer's V is .2 which is viewed as a medium effect. However, the Chi squared test did not indicate an association between urine drug screen and type of injury. In other words, urine drug screen is completely independent from injury type.

Research Question Four and Five: Screening and Results

The data for questions four and five were screened together for normality, missing data, outliers, linearity, homoscedasticity of residuals, and multicollinearity. The continuous variables (resistance, quality of life and age) were examined for normal distribution with the Kolmogorov-Smirnov and Shapiro-Wilk tests which indicated that the assumption of normality was not met (p > .05). This means that the data may skew the results. The means, standard deviations, skewness, and kurtosis are presented in Table 13.

Table 13: *Normality distribution of violent injured patients*

	N	M	SD	Range	Minimum	Maximum	Skewness	Kurtosis
Resistance 1	72	2.28	1.14	4	1	5	.66	-.38
Resistance 2	72	1.81	.99	4	1	5	1.13	.64
Age	72	37.11	9.31	39	18	57	.03	-.68
Quality of Life	31	6.90	2.87	9	1	10	.60	-.66

There were several missing cases for research question number four. The positive urine drug screen variable had 28 missing cases (38.9%). Imputation was not employed because the MR test assumption was not met. The Mahalanobis's distance (MD = 13.80) was used to detect multivariate outliers. No cases were greater than 14.06, the critical value of chi square (α=.001, *df*=7) indicated that there were no AUDIT scores that were outliers. The data was run in SPSS for multicollinearity concerns. Multicollinearity and singularity test was run and the assumption was satisfied (r < .9). The assumption was met and the independent variables were not highly correlated. According to the Durbin Watson, we can assume the residuals are independent, (2.55). Homoscedasticity was visually inspected and the variance of observations around the regression line (the residual SE) was not constant. Therefore, the assumption was not met. Linearity was visually inspected with the scatterplots for research questions four and five. No patterns were present; therefore a linear relationship was not found as evidenced by Figures 2-8 below and the assumption was not met.

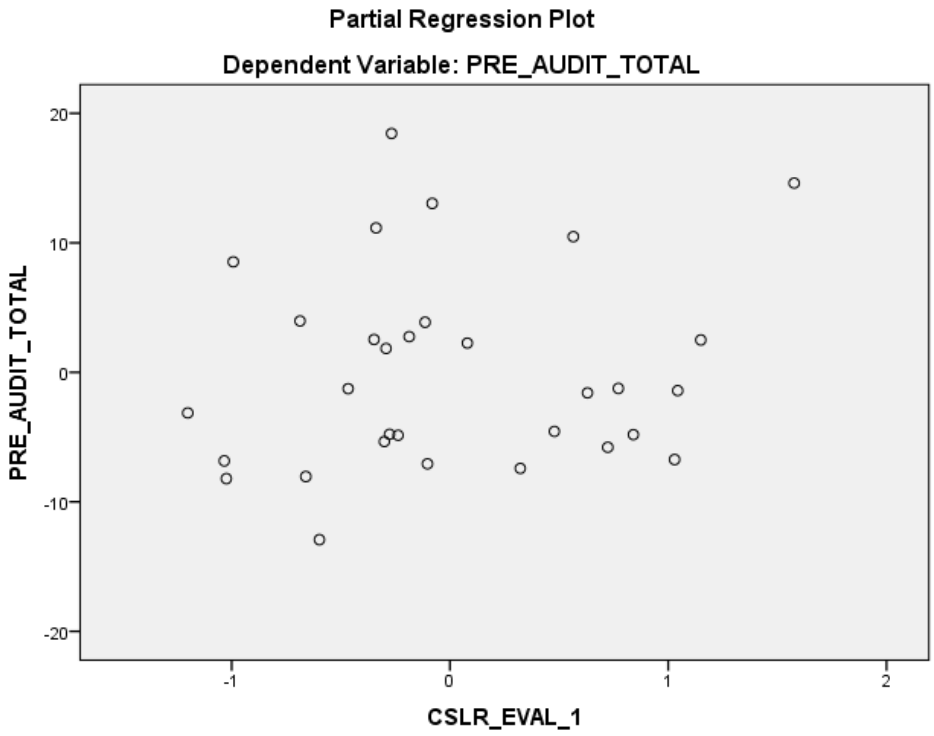

Figure 2: *Research question four linearity for resistance (Q1) and risky drinking*

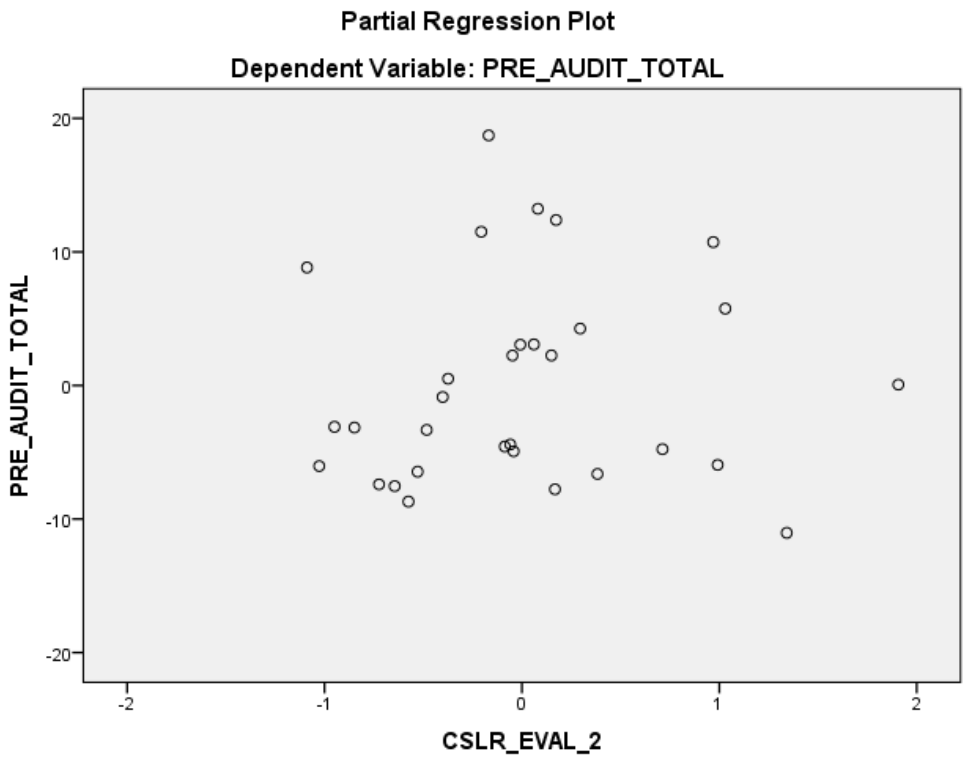

Figure 3: *Research question one linearity for resistance (Q2) and risky drinking*

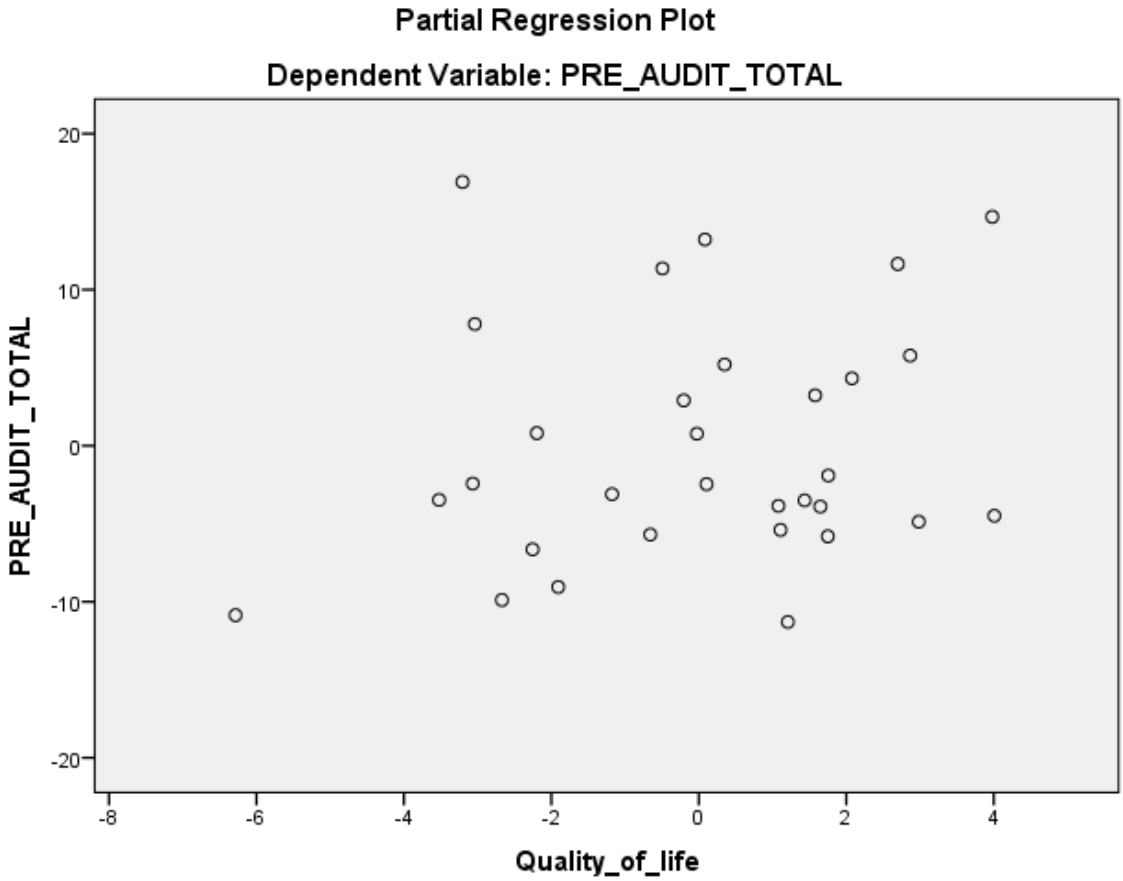

Figure 4: *Research question one linearity for quality of life and risky drinking*

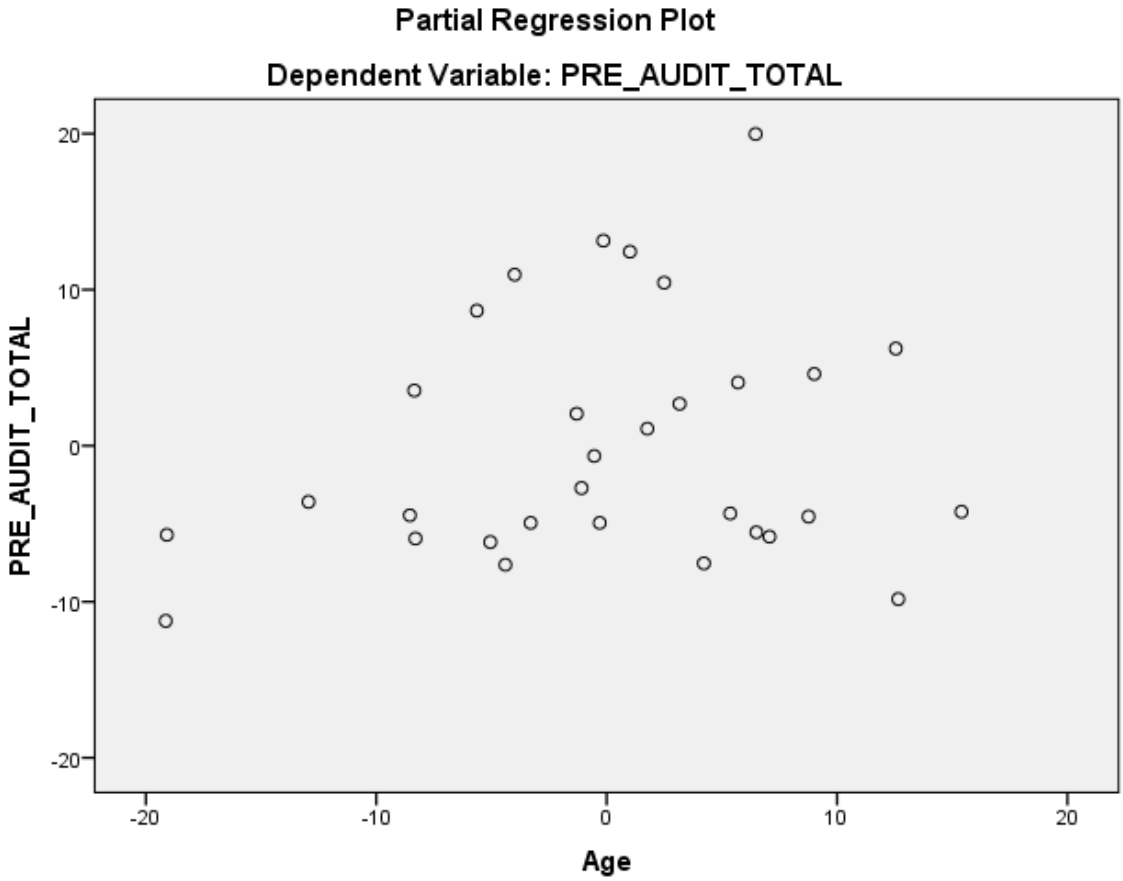

Figure 5: *Research question one linearity for age and risky drinking*

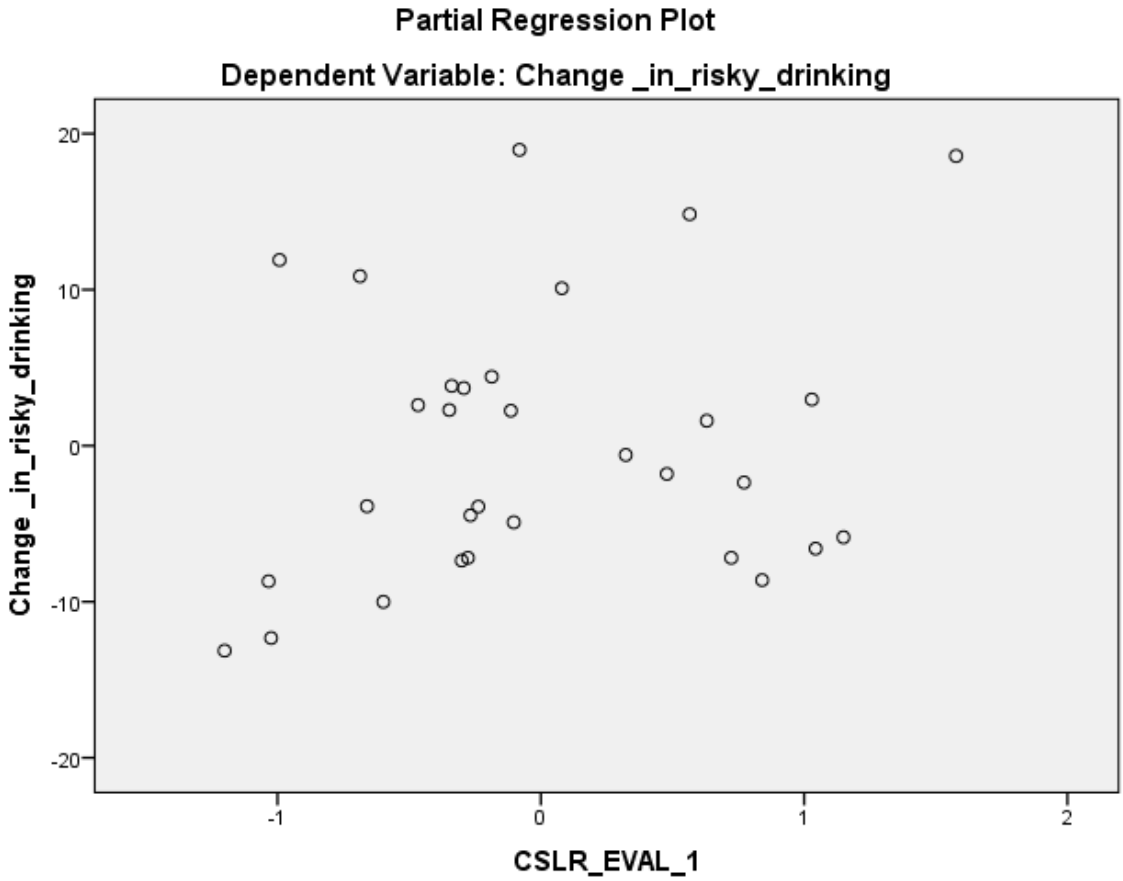

Figure 6: *Research question five linearity for resistance (Q1) and change risky drinking*

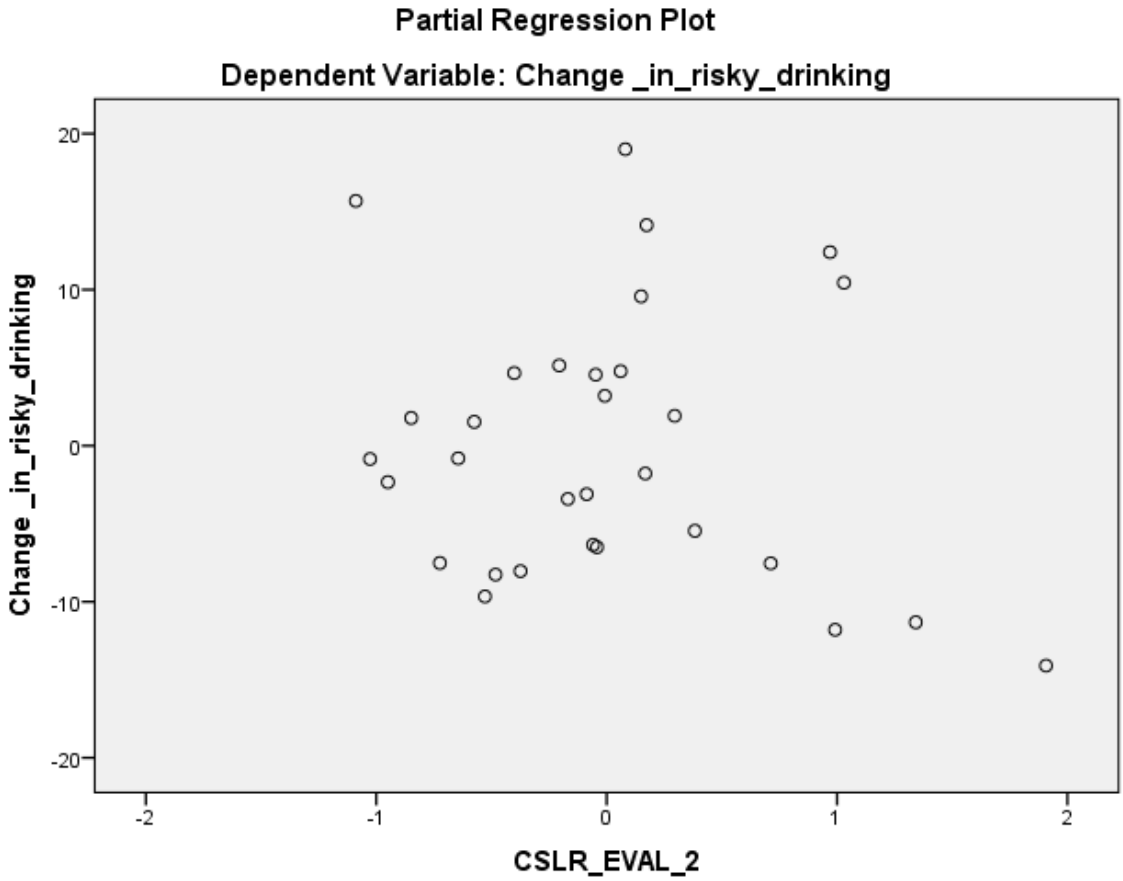

Figure 7: *Research question five linearity for resistance(Q2) and change risky drinking*

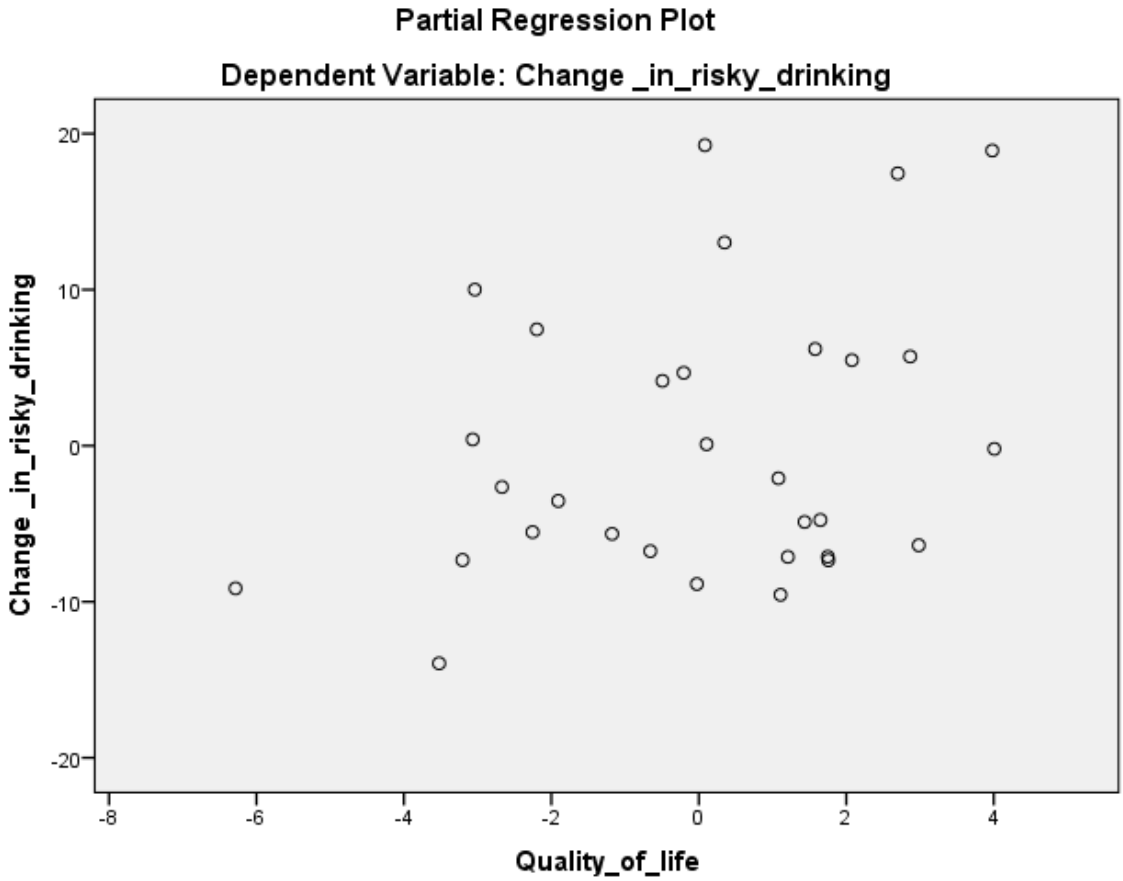

Figure 8*: Research question give linearity for quality of life and change risky drinking*

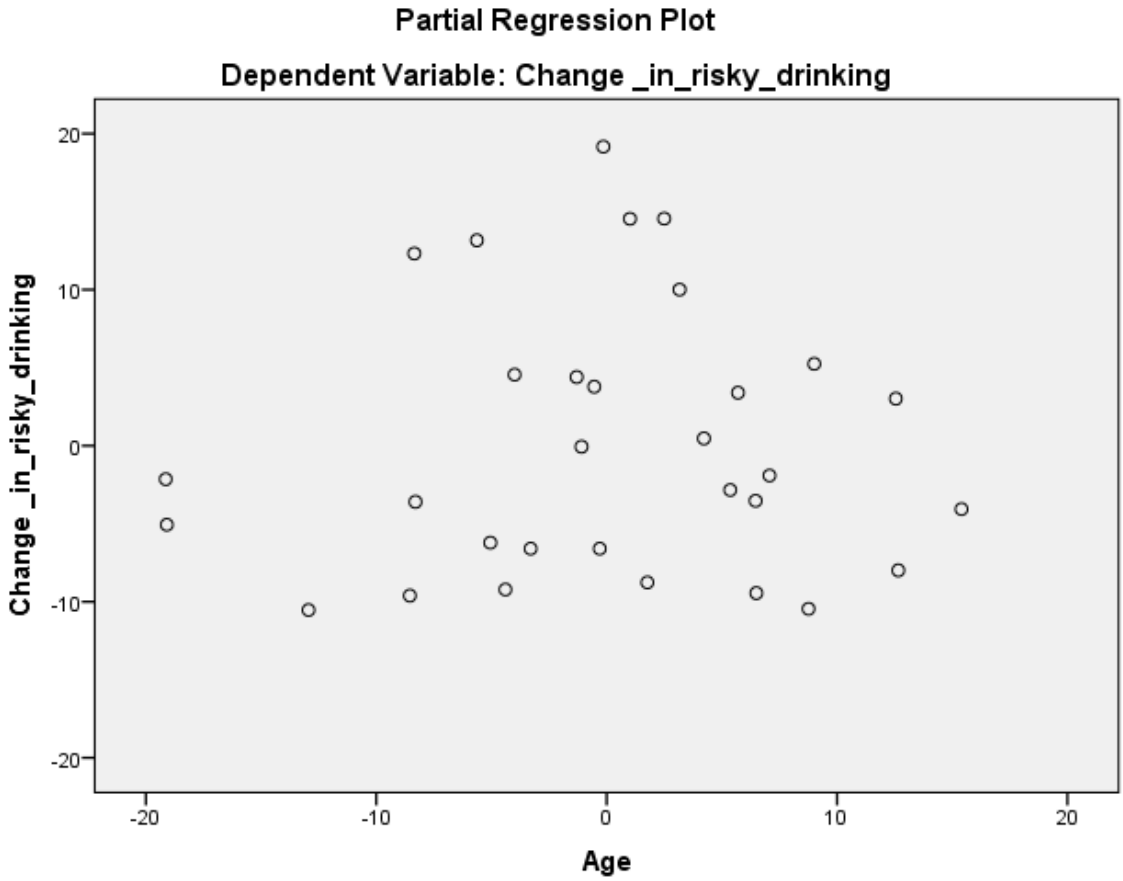

Figure 9: *Research question five linearity for age and change risky drinking*

Correlations

A point-biserial coefficient was run with the categorical variables (urine drug screen, injury type, insurance, race) and the dependent variable (risky drinking and change in risky drinking) for research questions four and five respectively. There was no significant correlations among these variables. The results are presented in Table 14.

Table 14: *Correlation of categorical variables*

Variables	1	2	3	4
1. Injury Type	-			
2. Urine Drug Screen	-.172	-		
3. Race	.152	-.08	-	-
4. Insurance Status	.031	-.04	.-.019	-

A Pearson product-moment correlation coefficient was computed to assess the relationship between the seven factors (resistance, quality of life, and age) and risky drinking (initial AUDIT scores). A significant correlation between the two resistance questions as well as the change and initial risky drinking were found. These correlations could be expected because these variables are measuring a similar concept. Also, a relationship between age and initial risky drinking was found. The continuous predictor variables for research question four and five were not correlated.

Table 15: *Correlations Matrix of continuous variables* of violently injured

Variables	1	2	3	4	5
1. Resistance Q1	-				
2. Resistance Q2	.65**	-			
3. Initial Risky Drinking	.038	-.132	-		
4. Change in Risky Drinking	-.017	-.185	.65**	-	

5. Age	.089	.076	.310**	-.041	-

Research Question Four and Five Results: Bivariate Correlations (Simultaneous Linear Regression)

As mentioned above due to the lack of correlation noted in the Pearson product-moment correlation coefficient between the factors (resistance, quality of life, and age) and the change in risky drinking, consequently, a simultaneous linear regression could not be conducted. However, a statistically significant relationship between age and the initial assessment of risky drinking of .31 was found, which means that 9% of the variance in the initial AUDIT is explained by age. This finding indicates the older the patient, the higher the initial AUDIT score (more severe risky drinking).

Summary

Chapter IV offered a thorough overview of this study's statistical analyses. The purpose of the research was to first compare the differences between violently and nonviolently injured patients initial risky drinking level following a brief counseling intervention, change in risky drinking from the initial intervention to the 6-month follow up, and various predictive factors between the two groups. Also, violently injured patients' predictive factors of risky drinking and the change in risky drinking were examined. Descriptive statistics, t-tests, a chi squared test, repeated measure ANOVA, and bivariate correlations results were offered.

The descriptive results of each question were provided. The patients were predominately White (72.7%) and male (81.7%) for the first three questions. The patients for questions four through five were 93% male and divided evenly between nonwhite

(52%) and white (48%) patients. The results reveal that there are no significant differences between the two groups. Furthermore, the predictive factors could not be analyzed in a regression analysis because the factors were not correlated. In other words, the assumption of linear relationship between the independent variables and the dependent variable is not met.

CHAPTER V: DISCUSSION

This study aimed to identify the difference between violently and nonviolently injured trauma patients in terms of risky drinking after an initial brief counseling intervention at the bedside, the change between the initial assessment and six month follow up, and the factors of resistance, quality of life, urine drug screen, insurance status, age and race. Among the violently injured patients, the factors of resistance, urine drug screen, type of violent injury, race, age and risky drinking at the initial intervention and the change in risky drinking between the initial intervention and the follow up was also studied. The meaning behind this study's results is discussed in this chapter. First, the demographic data for the study will be examined. Second, the results for each research question will be explored and possible explanations will be discussed. Third, the limitations, implications and future research will be considered. The chapter will conclude with a summary.

Discussion of Demographics

The demographics will be discussed first by the total participants (n =333), then by the violently injured patients (n =72). Race, gender, age, and blood alcohol level will be examined. Generally, a thorough inspection of the total participant's demographics revealed minimum patient diversity. The total large sample (n =333) and the six month follow up (n =181) were majority white (72.7% and 77.3% respectively). Other seminal studies have found more ethnic diversity. For instance, Gentilello et al. (1999) did not share the percentages of patient ethnicity, but did mention that the majority of the trauma

patients was nonwhite. One explanation could be the location of the trauma center. Therefore, the lack of ethnic diversity is important to consider when generalizing to trauma populations. However, the violently injured group had a far more ethnic diverse sample with 48% White and 52% nonwhite. Riley et al. (2015) writes that African-American men experienced higher rates of violent injury than Whites between the ages of 15 and 24. The location of the trauma center may influence the diversity of the sample. However, this sample seems more consistent with other research and thus more generalizable to the violently injured trauma population.

The gender of the participants was majority male in the total large sample (81.7%), the follow up sample (82.3%), and the violently injured group (93%) respectively. This finding is consistent with international data that trauma patients are more often male (Cornwall et al., 1998; Gunning et al., 2015). It is noteworthy that there is approximately an 11% difference in gender between the violently and nonviolently injured groups. This finding is consistent with a systemic review that found that men have higher rates of violent injury than women (Riley et al., 2015.). Thus this sample's characteristic of gender seems more generalizable to the trauma patient population.

The age of the all participants and the follow up participants (n =181) was 39 and the age of the violently injured patients was 38. According to the American College of Surgeons (2011), this is in accordance with recorded trauma patient age as a spike in trauma care occurs between the ages of 14-29 and again at 40. The notion that violent injury occurs most often in youth can be disputed with these demographics. The age is consistent with other trauma studies. In the Gentiello et al. (1999) seminal study, they reported 82% of participants had a mean age of 36 years.

In regard to the urine drug screens, there were noticeable differences. Of the total sample (*n* = 333), 70.6% positive urine drug screen with 31.5% missing drug screens indicating that the majority of the patients tested positive for drugs upon admission. This number is slightly higher with trauma findings, in that many studies have found that the use of drugs and alcohol far exceed the general population. In this study, 71% of trauma patients had positive screening for both drugs and alcohol, with 42% of those being a positive drug screen (Cornwell et al., 1998). However, in the follow up (n = 181), fewer patients had a positive drug screen (48.1%) with similar missing drug screening (32.6%) of the total 333 sample. In other words, slightly over half of the patients had a negative drug screen upon admission and more patients without a drug screen administered were reached at the six-month follow up. These demographic findings highlight that more is left unknown about patient drug use because of the missing screens; thus this limits the ability to interpret the data more fully. That aside, it is not surprising that patients with a negative drug screen were reached at follow up because this population may not be struggling with substance use and therefore may be more accessible and more willing to communicate with a counselor. It is reasonable to conclude that obtaining urine drug screens for all patients is valuable, and continued creative efforts to reach patients with positive urine drug screens is also important.

Differences in Risky Drinking Scores

A t-test was performed to determine any differences in the individual AUDIT item responses between the violently and nonviolently injured trauma patients. These results indicated that there is no statistically significant difference in the AUDIT item responses between the two groups. A surprising result was that both groups responded in

the same way. In this study, it was theorized that the groups would be different, particularly with AUDIT item nine: “Have you or someone else been injured as a result of your drinking?” It is reasonable for one to theorize that the nonviolently injured patients may be more likely to view the injury as related to their drinking; for example, if they were injured while driving intoxicated, they may see a connection between their actions and the injury. Violently injured patients may be less inclined to see the connection between their drinking and their injury because someone else inflicted harm on them. In other words, the violently injured may not view the injury as “their fault” because they were injured by another party, therefore being less likely to consider that their risky drinking behaviors may have played a role in their injury. According to the results, this assumption was not proven accurate. The violently injured responded in a way similar to the nonviolently injured patients, indicating that the type of injury did not seem to impact their individual AUDIT item responses. Additionally, according to a Chi square test, although there was no significance between the groups, a trend was found in that 56.2% of the violently injured patients reported that they have never been injured due to drinking. Of the nonviolently injured, 44.6% reported the same. This finding is important because viewing drinking behaviors as playing a role in the injury may impact future willingness and ability to reduce drinking. Walton et al. (2009) found that patients who recognized that alcohol use was connect to their injury consumed less alcohol weekly and had less frequent heavy drinking episodes at 12 months than the patients that did not draw a connection between alcohol and their injury. It seems reasonable that continued exploration associated with the AUDIT item responses may be important to consider with violently injured patients.

Also, the highest scores for both groups were on AUDIT items one through three and nine and ten, ranging from a mean of 1.64 to 2.9. These answers coincide with the conceptual domains: questions 1-3 address alcohol consumption and 9-10 measure alcohol-related problems (Saunders et al., 1993). The domain of drinking behaviors is addressed by questions 4-6 and the domain of adverse reactions is addressed by questions 7-8 with mean scores ranging from .53 to .78. Perhaps, patients find it easier to share how much alcohol they consume (domains 1-3) but may find it more difficult to speak to the behaviors and adverse reactions because they may perceive them as consequences which generate shame or guilt (e.g. failing to do what was normally expected, feeling guilt or remorse, unable to remember what happen the night before). However, making sense of the differences in alcohol-related problems (domain 9-10) and adverse reactions and drinking behaviors (domain 4-6) is more challenging to explain. Perhaps, (the domain 4-6) items are seen as more related to addiction which may be more challenging to acknowledge or accept. Thus it seems valuable to compare the differences in the domains between these two groups, perhaps by means of a qualitative analysis.

However, it is important to consider some methodological concerns, namely, the small sample size of violently injured patients that may have impacted the results. The low number of violently injured cases may lead to a Type II error, meaning failing to detect an effect that is present. Increasing sample size offers more reliable results with greater precision and power to detect differences.

Another approach, perhaps qualitative in nature, may be a means to learn more about possible differences through providing patients with a way to expound upon these

answers within the brief counseling intervention. Therefore, this is worthy of further research to provide more insight.

When initial AUDIT scores were compared to six-month follow-up scores between the violently injured and nonviolently-injured patients, no significant differences were found at either assessment point. However, the AUDIT scores reduced significantly for the entire group assessed at the six-month follow-up. These results indicate that the violently injured patients' risky drinking reduced at a similar rate to the nonviolently injured patients. These findings may come as surprise because one may have presumed that the violently injured patient may be experiencing more mental health concerns—such as acute stress, PTSD, and depression—that may distract them from focusing on risky drinking behaviors or may increase risky drinking behaviors as a means to cope with these other health concerns. In fact, several studies corroborate this view. A 2001 study researched the two most common disorders, major depressive disorder and PTSD, associated with trauma among survivors of intimate partner violence and found a strong association between these comorbidities and IPV (Stein & Kennedy, 2001). Likewise, several studies found an association between assault and PTSD (Brewin, Andrews, Rose, & Kirk, 1999; Elklit & Brink, 2004; Holbrook, Hoyt, Stein, & Sieber, 2001). Yet, according to these results, the violently injured patients did reduce risky drinking in a similar fashion as the nonviolently injured patients. This finding may imply that the violently injured patients do not require any additional intervention—for instance, additional assessments addressing violence—to experience a reduction in drinking habits. The results may also indicate that brief counseling intervention may have played a role in this reduction and should be used for violently injured patients. It seems necessary to

conduct future research to determine if brief intervention indeed did make a difference. Future research that includes nontreatment groups is needed to determine the actual impact of brief counseling intervention.

Comparison of additional factors of resistance, quality of life, insurance status, urine drug screen, race and age

The factors of resistance, quality of life, insurance status, urine drug screen, race and age were compared between the violently and nonviolently injured patients. The results concluded that these baseline factors are not significantly different between the violently and nonviolently injured patients. These factors have not been studied with a violently injured population specifically. However, the results of this study will be compared to research with trauma patients and connections will be drawn.

This study examined the differences in resistance between violently injured and nonviolently injured patient at the beginning of a brief counseling intervention and at the end of the session. The results showed no significant difference between the two groups. This finding is important because it indicates that the baseline resistance levels of violently injured and nonviolently injured patients are similar at both points in the session. One may conclude that because of the lack of differences, counselors providing the brief intervention do not need to attend to the resistance in the session differently for violently injured patients. Other similarities were also observed. The scores were on a Likert scale and ranged from “little to no resistance” to “mild resistance” at the beginning of the brief intervention and at the end of the intervention for the violently injured group ($M = 2.27, 1.82$) and the nonviolently injured group ($M = 1.13, .99$) which seems to indicate lower levels of resistance for both groups. It is theorized that high levels of

resistance may negatively impact patient's change in risky drinking behaviors. In other words, the more resistance noted in the session the less likely the patient may be able to make changes. Perhaps, one may arrive at a few conclusions based on this result. One, the resistance is lowered because of the counselor's skills that foster a positive therapeutic alliance, thereby aiding in the reduction of risky drinking behaviors for both groups. Two, the patient may be experiencing a "teachable moment" during the session due to the sustained injuries and hospitalization which allows for less resistance and more willingness with the counselor. Without further examination, a conclusive understanding cannot be made. In essence, it may be possible that a reduction in resistance from the beginning to the end of the brief counseling intervention may validate the efficaciousness of counseling in building rapport and establishing trust.

Quality of life is considered an important aspect of patient well-being and care (Foster et al., 1999; Laudet, 2011) and therefore significant to consider with risky drinking populations. Although this study found no difference between the two groups, a trend associated with the quality of life construct was found. According to a Chi square test, a high percentage of patients rated a score of 5 or above. Of the violently injured patients 59.8% and 70% of the nonviolently injured patients rated above 5. One may hypothesize that quality of life for trauma patients after sustaining a traumatic injury would be well below (5) "ok fine" because the patient may be experiencing challenge with recovery from the physical injury, PTSD, acute stress, or depression. One alternative explanation may be associated with the concept of "post traumatic growth"—how people change in positive ways due to struggles with adversity (Joseph, Murphy, & Regel, 2012). For instance, the patient's view of quality of life may be altered due to the

experience of post traumatic growth. One study with female cancer patients found a relationship between quality of life and posttraumatic growth in that the more posttraumatic growth was experienced, the higher the quality of life (Morrill et al., 2008). Future research about quality of life associated with posttraumatic growth as it relates specifically to alcohol-related injury, either violently or nonviolently injured, is vital as a means to further understand patient outcomes and care.

Regarding race, a significance relationship between race and the type of injury was found. Of the nonwhite patients, 41.8% were violently injured. Of the white patients, more were nonviolently injured, 85.5%. Thus race may be valuable in considering as a risk factor for violent injury. This finding may indicate a need to support the nonwhite patients to prevent violent injury and reduce risky drinking behaviors. Further qualitative research associated with race, cultural sensitivities and brief counseling intervention may be useful.

Likewise, a significance relationship between insurance status and the type of injury was found. Twenty-eight percent of the violently injured did not have insurance. This was not surprising because Riley et al. (2015) found that those with Medicaid had higher rates of violent injury and death. It stands to reason that lack of insurance may be associated with violent injury and would be a valuable risk factor for alcohol-related violent injury. Therefore, the factor of insurance status may serve as a means to help prevent future violent injury and risky drinking. Understanding more deeply the relationship between insurance status and violent injury and risky drinking is crucial. For instance, from an existential perspective, might those without insurance be more likely to

be unemployed and therefore have less meaning and purpose, therefore engage in risky behaviors as a means to cope?

However, the lack of differences in age between the violently ($M = 37.05$, $SD = 9.26$) and nonviolently injured patients ($M = 37.03$, $SD = 13.42$), $t(331) = 4.95$, $p < .005$) was unexpected because research has indicated that youth have higher rates of violent injury (CDC, 2010) and engage in more risky behaviors, such as violence and drinking (Swahn & Dononvan, 2006; Walton et al., 2009).One would have expected that more of the younger patients would be violently injured. On the contrary, the mean age does align with the mean age of trauma patients (ACS, 2011). Also, the inclusion criteria of 18 years and above for this study may have influenced these results. Future research including younger patients is worthy of consideration.

No difference was found between the groups' urine drug screens. This is striking because an association between multi-drug use and violence has been clearly established (Blondell et al., 2005; Madan, Yu, & Beech, 1999). One may reason that the lack of difference may be due to the missing urine drug screens which may have skewed the data. Obtaining urine drug screens for future research studies is important in understanding the trauma patient population more clearly.

Prediction of Risky Drinking in Violently Injured Patients

The lack of correlation between the factors (resistance, quality of life, and age) and risky drinking and the change in risky drinking did not allow for a simultaneous linear regression to be utilized. However, a statistically significant correlation between age of the violently injured patients and the initial assessment of risky drinking was found. This finding indicates that the older the patient, the higher the AUDIT score (more

severe risky drinking). This result was slightly surprising because research had indicated that younger men or more likely to engage in risky drinking behaviors (Hill & Chow, 2002). Also, a correlation between the two resistance questions was found. This correlation may indicate that the concept of the question is reliable in nature. Further studies in this trauma setting associated with resistance could be valuable with violently injured patients to further understand how resistance influences this population.

It is important to acknowledge that the small sample size of the violently injured and the number of variables may have impacted the power of the correlations. Therefore, a larger sample size and fewer variables may have increased the power. It is possible that more correlations may have been discovered with a larger sample size and fewer variables which may have allowed for a simultaneous linear regression to be employed.

Limitations

Several limitations have been noted in this study. First, the results of this study have limited generalizability, meaning they may not represent all violently injured patients in all trauma centers. Second, the study only included English and Spanish speaking participants. Third, the AUDIT is a self-report tool and could lead to reporter bias. However, the AUDIT is considered a strong instrument as supported by research (Babor et al., 2001; Bray, Zarkin, Hinde, & Mills, 2012). Fourth, the study had a small sample size due to the lower number of violently injury hospitalizations. It is important to consider how it may have impacted the results, such as the statistical power. Likewise, the low number of violently injured cases at the follow up prevented some statistical analyses. Only 43.8% of the 72 cases followed up. Another

limitation is the self-report nature of the patient's resistance by the counselor. In future studies, a psychometrically sound measure should be utilized for the concept of resistance. This tool needs to be valid and reliable prior to use, thus ensuring higher interrater reliability. Also, another measure for quality of life may also be useful.

Implications

There are several clinical implications that developed from this research. Trauma Centers provide valuable care to patients at critical times after an injury. The American College of Surgeons Committee on Trauma (ACS/COT) mandate of the establishment of alcohol screening and brief intervention (ASBI) in level I trauma centers and level II trauma centers addresses the great need to address risky drinking for trauma patients, yet no specific guidelines on this care have been offered. This study offers optimism for those that are violently injured in that after a brief counseling intervention, the patients saw a reduction in risky drinking. Thus it seems rational to conclude that brief counseling intervention can be used as a means to reduce risky drinking in violently injured trauma patients without any changes to the current brief counseling intervention. Conversely, if the nature of the violent injury was explored within the brief counseling intervention, it may have a greater impact on the reduction of drinking. It seems that this study is the first to address the impact of brief counseling intervention for alcohol-related violently injured patients. Continued focus in this area is needed with more emphasis on studies with control groups.

Also, the American healthcare system has begun to shift away from a disjointed healthcare system towards integrated care which reflects a broad conception of health that combines both medical and behavioral healthcare. It has been described as a link between

the biomedical model and psychosocial and behavioral components (Harris, 2010). In the context of the changing American healthcare landscape, integrated care through an interdisciplinary and patient centered approach serves to provide care for the whole person. In regard to this study, the notion of quality of life seems to be an essential part of integrated care in that it is a vital factor in assessing patient's holistic care and health outcomes. In fact, quality of life (QoL) is utilized as an important clinical and research outcome in the study of substance use (Zubaran & Foresti, 2009). This study found higher (positive) scores associated with quality of life post injury; these findings seem worthy of attention within trauma populations who sustained alcohol related violent injuries. Understanding what conclusions may be drawn from understanding patient's quality of life seems crucial for work in integrated care in the hospital setting—and more specifically trauma centers—to understand more clearly what is the patient's experience from a holistic and wellbeing perspective. It is possible that future research in this area may lead to high quality of care and perhaps prevent future alcohol related injuries and even reduce healthcare costs.

Lastly, the counseling field is familiar with transformation. What was once strictly "guidance counseling" is today a rigorous, empirically-based discipline understood to be essential to human well-being. As we observe the integrated delivery of physical and mental health services beginning to change our health care system, one might wonder how counselors fit into this transformation. How will this change affect how counselors meet the needs of these populations? How might counselors redefine their roles, as they find themselves practicing as often in the hospital setting as in the office? Because this study may indicate that alcohol brief counseling interventions are

effective in reducing risky drinking with violently injured patients, continued education for counselors and counselor educators in brief counseling intervention may be warranted. Furthermore, this brief trauma mandate may afford more professional opportunities for counselors in integrated care setting such as hospital trauma centers to offer these services. Thus knowledge about these populations and working in these settings seems essential.

Future Research

There are numerous opportunities and considerations for future research associated with alcohol-related violent injury. The results comparing the individual AUDIT item responses concluded that there are no differences between the two groups. In essence, the violently injured patients did not respond differently from the nonviolently injured meaning that the type of injury did not influence responses. However, it may prove beneficial to consider the AUDIT item responses from a qualitative research perspective offering richer and more detailed information enabling counselors to use this understanding to enhance the counseling intervention unique to the person, such as exploring the violent injury and how it relates to the risky drinking. Thus more research may be worth valuable.

The sample size of the violently injured patients was small for this particular research study; therefore a larger scale study with patients of all ages would be valuable. This can be accomplished by collaborating with other trauma centers through a multisite study. Along these lines, it is important in future research to explore the best practices for follow-up with violently injured trauma patients to increase the sample size. There is a possibility that the trauma population can be transient in general, and violently injured

patients might be even more so. Violently injured patients may not feel safe at home and thus not return to their previous residence. It is important to find other means to connect with these patients for follow up. Technology may be a useful way to reach them in future studies.

It also seems essential to continue to explore the impact of alcohol brief counseling interventions in the future for violently injured patients. One may also conclude that if the nature of the injury was also intentionally addressed within the brief counseling intervention, more of a reduction in risky drinking may occur. Future research may explore how a brief intervention could purposefully address the nature of the injury which, in turn, may serve to reduce risky drinking even more significantly. Another aspect of reducing violent injury may be to explore the risky drinking behaviors of the perpetrator of the violent injury. Research has found that half of violently injured people reported that the perpetrator of violence was drinking at the time of injury (Pernanen, 1991). However, this research may need to occur outside trauma centers, as often times, the perpetrator is not hospitalized. But this is another important opportunity worthy of research in the counseling field as a means to prevent violent injury.

Careful consideration of the patient population is important for future studies. The age of the violently injured patients is noteworthy as research indicates that younger individuals are more likely to be violently injured (CDC, 2010). However, the demographics for this sample was older, but fits with the general trauma population and the second peak in hospital trauma admissions at age 40 (ACS, (2011). For instance, older populations may have had several injuries, thus impacting willingness to change.

It also seems important to consider the cultural differences that may impact risky

drinking and violent injury. It would be interesting to compare the differences in the violently injured between race and age. For instance, examining the differences among the younger African-American patients versus the younger White patients and the older African-American patients versus the older White patients may be worth considering for future research. This approach may help provide a clearer understanding of potential difference and thus the relevant needs for these groups. For instance, White males may be more likely to have means to engage in higher risk behaviors. Future studies that include more diversity would be valuable to examine possible differences among minority groups. Further understanding of these factors could support counselors in providing cultural appropriate care to patients. Also, how might socioeconomic status play a part in risky drinking violent injury and race is worthy of consideration.

The concept of quality of life is also an important factor to include in future research. The quality of life for the patients was a mean of between 6.59 and 6.99 out of 10. This score is above average indicating an above average rating of quality of life. A qualitative study investigating the meaning of quality of life for trauma patients may be valuable while also exploring the reduction of risky drinking. More understanding of how quality of life impacts a patient's ability to reduce drinking after traumatic injury is needed. Also, an improvement in quality of life may align with the post traumatic growth model (Joseph, Murphy, & Regel, 2012) and is worthy of exploration.

It is important to continue to learn more about the violently injured because violent injury is a substantial problem for the modern world. Trauma Centers are key sites to access violently injured individuals for research, thus studies should be continued

within this population in this setting. Also, future research could contribute greatly to the quality of care offered in Trauma Centers.

Conclusion

It is known that the hospital trauma care setting may provide a unique opportunity, a teachable moment, for those hospitalized for alcohol-related injuries. This study contributes to a greatly needed area of research to address the differences between violently injured and nonviolently injured patients during this crucial time. This study of the differences between the violently and nonviolently injured patients receiving brief counseling intervention at the bedside contributes to the understanding of how best to meet the needs of those that are violently injured.

This study helps to shed light on the violently injured patients and their similarities to those that are nonviolently injured. The results of this study are optimistic because they may imply that violently injured risky drinkers can benefit from a brief counseling intervention at the bedside in the same way those that are nonviolently can. Addressing specifically violent injury during a brief intervention may further reduce risky drinking, however future research is needed. The difference in insurance status and race may help providers support those at risk for violent injury and risky drinking. However, further research may be needed for more understanding of these differences.

The possible implications may be that resistance may be low when exploring risky drinking behaviors which speaks to the notion of the ability of counselors to support change. The idea that quality of life may be higher after injury may give rise to future exploration and understanding of posttraumatic growth and how this may foster change in risky drinking behaviors.

Trauma systems were developed during the last 40 years to coordinate and improve the care for the injured (ACS/COT, 2006), in fitting with this mission, understanding more about the unique risks of trauma populations is vital to continue to improve upon this care. This study offers more information about those patients who sustained alcohol-related violent injuries and how to continue to provide a high standard of care while addressing the needs of the whole person.

There is so much yet to learn about alcohol-related violently injured trauma patients. This study is a small step to understand and provide care for these individuals. Counselors are well suited to be an integrated part of this care. In an effort to improve the specific types of interventions that will reduce future risky drinking and potentially reduce associated violent injuries, future research, both quantitative and qualitative, should focus on alcohol screening and brief counseling intervention for violently injured patients.

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APPENDIX A: TEACHABLE MOMENT INFORMED CONSENT

WAKE FOREST
UNIVERSITY
HEALTH SCIENCES

THE TEACHABLE MOMENT: SCREENING AND BRIEF INTERVENTION FOR ADMITTED TRAUMA PATIENTS

Informed Consent Form to Participate in Research Mary Claire O'Brien, MD, Principal Investigator

INTRODUCTION

You are invited to be in a research study. You are being asked to take part in this study because it appears from your answers to our routine questions that you might be consuming alcohol in a way that might be harmful to your health. Your participation in the research study is voluntary. Please take your time to make your decision, and ask the study staff or your study doctor to explain any words or information that you do not understand. You may also discuss the study with your friends and family.

WHY IS THIS STUDY BEING DONE?

The American College of Surgeons now requires screening for alcohol use in trauma centers. The purpose of this research study is to provide information about the best screening and treatment methods. We hope our findings will provide information that will improve healthcare by reducing problems related to risky alcohol use.

HOW MANY PEOPLE WILL TAKE PART IN THE STUDY?

We plan to enroll about 514 participants in the study. All of these will be at Wake Forest University Baptist Medical Center.

WHAT IS INVOLVED IN THE STUDY?

Once you have agreed to take part in the study, a trauma center counselor will talk with you further about your test results and your use of alcohol. The trauma team is conducting a comparison of two different ways of talking about your alcohol use. You will be randomized into one of the two study groups. Randomization means that you are put into a group by chance. It is like flipping a coin. You will have a 50-50 chance of

being placed in either of the two study groups.

Both discussions will include your individual screening results and will suggest ways you might want to change your use of alcohol. Both discussions will talk about how injury and alcohol are related.

We will call all study participants about 6 months after the discussion. This is to ask again about your alcohol use and any problems you might have had after discharge that are possibly related to alcohol.

Audiotaping: As part of this research study, your brief counseling session might be audiotaped. The audiotapes are being collected randomly in order to learn how the counselors interact with the study participants. The research staff, including the counselors, will review these audiotapes. Your confidentiality will be respected and protected. The audiotapes will not be labeled with any identifying names or descriptions, and will be kept in a locked filing cabinet in the project office. Upon completion of the study, all audiotapes will be destroyed. You may request the recording be stopped at any time during the course of the research study or may ask to have previous audiotapes erased. You may withdraw your consent for us to use the audiotape after it is completed.

Because the tapes are collected at random, we will not know if your session is going to be audiotaped until after you agree to the research, but you may refuse to be audiotaped at that time, and still choose to participate in the study.

HOW LONG WILL I BE IN THE STUDY?

Both discussions are meant to be brief (less than 20 minutes.) The trauma center counselors are willing to talk with you longer, if you prefer.

We will call you on the telephone in approximately 6 months to ask about your alcohol use. That means that you will be in the study for approximately 6 months.

You can stop participating at any time. If you decide to stop participating in the study we encourage you to talk to the investigators or study staff first to learn about any potential health or safety consequences.

WHAT ARE THE RISKS OF THE STUDY?

You might become upset by being asked personal questions about your behaviors. The

counselors have expertise in dealing with these reactions. Other studies have not found significant harms resulting from similar discussions. Taking part in this research study may involve providing information that you consider confidential or private. Efforts, such as coding research records, keeping research records secure and allowing only authorized people to have access to research records, will be made to keep your information safe.

The risk of harm or discomfort that may happen as a result of taking part in this research study is not expected to be more than in daily life or from routine physical or psychological examinations or tests. You should discuss the risk of being in this study with the study staff.

ARE THERE BENEFITS TO TAKING PART IN THE STUDY?

You will learn about healthy behaviors, and could acquire knowledge and skills that protect you against unhealthy behaviors. You will also receive written information about safe drinking. You will be informed about local alcohol counseling services.

We hope the information learned from this study will benefit other people in the future.

WHAT OTHER CHOICES ARE THERE?

Your alternative is to not participate in this study. If you choose not to participate in the study, the trauma center counselor will still offer to discuss your alcohol use (not as part of a research study.) We will also still offer you written information about safe drinking, and tell you about local alcohol counseling services.

WHAT ABOUT THE USE, DISCLOSURE AND CONFIDENTIALITY OF HEALTH INFORMATION?

All confidential patient information is protected by the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and its regulations. The Code of Federal Regulations states that hospitalized patients must sign a specific permission form to permit disclosure of information related to alcohol treatment. Disclosure of confidential patient information is not permitted to employers or insurance providers without the specific written consent of the patient.

By taking part in this research study, your personal health information, as well as information that directly identifies you, may be used and disclosed to study personnel. The study personnel will keep all of this information confidential. Information that

identifies you includes, but is not limited to, such things as your name, address, telephone number, date of birth. Your personal health information includes all information about you that is collected or created during the study for research purposes. It also includes your personal health information that is related to this study and that is maintained in your medical records at this institution and at other places such as other hospitals and clinics where you may have received medical care. Examples of your personal health information include your health history, your family health history, how you respond to study activities or procedures, laboratory and other test results, audiotapes and information from study sessions, and phone calls.

Your personal health information and information that identifies you ("your health information") may be given to others during and after the study. This is for reasons such as to carry out the study, to determine the results of the study, to make sure the study is being done correctly, and to provide required reports.

Some of the people, agencies and businesses that may receive and use your health information are the research sponsor; representatives of the sponsor assisting with the research; the Institutional Review Board; representatives of Wake Forest University Health Sciences and North Carolina Baptist Hospital; representatives from government agencies such as the Food and Drug Administration (FDA), the Department of Health and Human Services (DHHS), the Robert Wood Johnson Foundation (RWJF) and similar agencies in other countries.

Your name will not be stored with your answers in the study computer database.

You will not be directly identified in any publication or presentation that may result from this study.

Your discussion with the trauma center counselor will be kept completely confidential. Your answers may be discussed with individuals caring for you who are not part of the study (for example, other nurses or doctors involved in your care.) This will help in providing you with appropriate medical care. The information collected or created as part of the study will not be placed in your medical record.

Laboratory test results and other medical reports created as a result of your participation in the research study may be entered into the computer systems of Wake Forest University Health Sciences and North Carolina Baptist Hospital. These will be kept secure, with access to this information limited to individuals with proper authority, but

who may not be directly involved with this research study.

When you sign this consent and authorization form you authorize or give permission for the use of your health information as described in the consent form. You can revoke or take away your permission to use and disclose your health information at any time. You do this by sending a written notice to the investigator in charge of the study at the following address:

Mary Claire O'Brien, MD Medical Center Boulevard Winston Salem, NC 27157-1089

If you withdraw your permission you will not be able to be in this study. If you withdraw your permission, no new health information that identifies you will be gathered after that date. Your health information that has already been gathered may still be used and disclosed to others as described in this form.

This authorization does not expire. WHAT ARE THE COSTS?

There are no costs to you for taking part in this study. All study costs, including any procedures related directly to the study, will be paid for by the study. Costs for your regular medical care, which are not related to this study, will be your own responsibility.

WILL YOU BE PAID FOR PARTICIPATING? You will be given a $15.00 gift card for completing the 6-month telephone follow-up call.

A post-card will be sent to you to remind you about the 6-month telephone call. We will use the address and phone number that you gave us when you were admitted to the hospital, unless you tell us you prefer differently.

WHO IS SPONSORING THIS STUDY?

This study is being sponsored by Robert Wood Johnson Foundation. The sponsor is providing money or other support to Wake Forest University Health Sciences to help conduct this study. The researchers do not have any direct financial interest in the sponsor.

WHAT ARE MY RIGHTS AS A RESEARCH STUDY PARTICIPANT?

Taking part in this study is voluntary. You may choose not to take part or you may leave the study at any time. Refusing to participate or leaving the study will not result in any

penalty or loss of benefits to which you are entitled. If you decide to stop participating in the study we encourage you to talk to the investigators or study staff first to learn about any potential health or safety consequences. The investigators also have the right to stop your participation in the study at any time. This could be because it is in your best medical interest or the availability of new information.

You will be given any new information we become aware of that would affect your willingness to continue to participate in the study.

Whom Do I Call if I Have Questions or Problems? For questions about the study or in the event of a research-related injury, contact the study investigator, Dr. Mary Claire O'Brien at (336) 716-4625 for (336) 713-9100 (after hours).

The Institutional Review Board (IRB) is a group of people who review the research to protect your rights. If you have a question about your rights as a research participant, you should contact the Chairman of the IRB at (336) 716-4542.

You will be given a signed copy of this consent form.

SIGNATURES I agree to take part in this study. I authorize the use and disclosure of my health

information as described in this consent and authorization form. If I have not already received a copy of the Privacy Notice, I may request one or one will be made available to me. I have had a chance to ask questions about being in this study and have those questions answered. By signing this consent and authorization form, I am not releasing or agreeing to release the investigator, the sponsor, the institution or its agents from liability for negligence.

_____ Subject Name (Printed)

_____ Subject Signature Date

_____ Person Obtaining Consent Date

APPENDIX B: ALCOHOL USE DISORDERS IDENTIFCATION TEST

Alcohol Use Disorders Identification Test (AUDIT)

Questions		0	1	2	3	4
1.	How often do you have a drink containing alcohol?	Never	Monthly or less	Two to four times a month	Two to three times a week	Four or more times a week

If the answer to question 1 is Never (0) skip to questions 9 and 10.

What do you usually drink? _____

2.	How many drinks containing alcohol do you have on a typical day when you are drinking? Number of drinks ☐	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3.	How often do you have five or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

How many drinks can you hold? ☐

4.	How often during the past year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

5.	How often during the past year have you failed to do what was normally expected from you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6.	How often during the past year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7.	How often during the past year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8.	How often during the year have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9.	Have you or someone else been injured as a result of your drinking?	No		Yes, But not during the last year		Yes, during the last year
10.	Has a relative or friend, or a doctor or other health worker been concerned about your drinking or	No		Yes, But not during		Yes, during the last

	suggested you cut down?			the last year		year

TOTAL AUDIT SCORE _____

APPENDIX C: PRE-INTERVENTION FORM

The Teachable Moment
Pre Intervention Form

Participant Study #

What is the reason for your current hospitalization?	(check all that apply)	Was this the result of your drinking? (Check if yes)
automobile accident	☐	☐
motorcycle accident	☐	☐
bicycle accident	☐	☐
moped accident	☐	☐
all-terrain vehicle accident	☐	☐
pedestrian (you) hit by someone else's motor vehicle	☐	☐
fall from a height	☐	☐
sexual assault	☐	☐
non-sexual assault	☐	☐
assault involving intimate/domestic partner	☐	☐
stab wound	☐	☐
gunshot wound	☐	☐
burn	☐	☐
other serious injury	☐	☐

Not including this hospitalization, in the past 6 months, have you experienced an injury due to any of the following?

	☐ No	☐ Yes (check all that apply)	Was the injury the result of your drinking? (Check if yes)	Did you seek medical treatment for your injury? (Check if yes)
automobile accident	☐	☐	☐	☐
motorcycle accident	☐	☐	☐	☐
bicycle accident	☐	☐	☐	☐
moped accident	☐	☐	☐	☐
all-terrain vehicle accident	☐	☐	☐	☐
pedestrian (you) hit by someone else's motor vehicle	☐	☐	☐	☐
fall from a height	☐	☐	☐	☐
sexual assault	☐	☐	☐	☐
non-sexual assault	☐	☐	☐	☐
assault involving intimate/domestic partner	☐	☐	☐	☐
stab wound	☐	☐	☐	☐
gunshot wound	☐	☐	☐	☐
burn	☐	☐	☐	☐

other serious injury	☐	☐	☐	☐

Please verify your contact information for us?

Home address:

We will mail your reminder postcard to this address, 2 weeks before we call you for your telephone follow-up. This is also the address we will use to mail your $15.00 gift card, after you complete the telephone follow-up. Please tell us if you prefer us to use a different address.

_____

_____

(If this is **not** the patient's home address, specify whose address was given.)

_____

Telephone contact numbers:

Home phone: _____ ☐

Cell phone: _____ ☐

Other (specify): _____ ☐

In 6 months, for the telephone follow-up, do you prefer that we call you at home, on your cell phone, or at another number? (check patient's preferred contact number, above)

Signature of trauma center counselor: _____ Date (mm/dd/yyyy): _____

APPENDIX D: POST-INTERVIEW FORM

The Teachable Moment
Post Intervention Form
(Telephone Follow-Up)

Participant Study #
_____

Date follow-up post card was mailed _ _ / _ _ / 20 _ _ (mm/dd/yyyy)

Was postcard returned to sender (study team) as undeliverable? ☐ Yes ☐ No

Patient able to complete follow-up telephone call ☐ Yes
☐ No **REASON**: _____

Patient willing to complete follow-up telephone call ☐ Yes
☐ No **REASON:** _____

Hi _____, I am calling today to ask you a few questions since your discharge from WFUBMC Trauma Center. You may recall giving us permission to contact you 6 months after your hospital stay as part of our research study about different ways to talk with people about their alcohol use.

Please answer the following questions thinking about the time since you left the hospital – these are the same questions we asked when you were in the hospital.

Because alcohol use can affect your health and can interfere with certain medications and treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest. Please think about your drinking **in the past 6 months** and remember that a drink means one beer, one small glass of wine (5 oz.), or one mixed drink containing one shot (1.5 oz.) of spirits.

Questions		0	1	2	3	4
1.	How often do you have a drink containing alcohol?	Never	Monthly or less	Two to four times a month	Two to three times a week	Four or more times a week

What do you usually drink? _____

2.	How many drinks containing alcohol do you have on a typical day when you are drinking? Number of drinks ☐	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3.	How often do you have five or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

In a typical week, how many days do you get drunk? By drunk, we mean "dizzy, unsteady, or sick to your stomach." ☐
How many drinks can you hold? ☐

Questions		0	1	2	3	4
4.	How often during the past 6 months since your discharge from the hospital have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
5.	How often during the past 6 months since your discharge from the hospital have you failed to do what was normally expected from you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
6.	How often during the past 6 months since your discharge from the hospital have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
7.	How often during the past 6 months since your discharge from the hospital have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
8.	How often during the past 6 months since your discharge from the hospital have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
9.	Have you or someone else been injured as a result of your drinking in the past 6 months since your discharge from the hospital?	No				Yes

How were you injured? If someone else was injured (not participant), check here, once. ☐	(check all that apply, for participant)	Did you seek medical treatment for your injury?
automobile accident	☐	☐
motorcycle accident	☐	☐
bicycle accident	☐	☐
moped accident	☐	☐
all-terrain vehicle accident	☐	☐
pedestrian (you) hit by someone else's motor vehicle	☐	☐
fall from a height	☐	☐

sexual assault	☐	☐
non-sexual assault	☐	☐
assault involving intimate/domestic partner	☐	☐
stab wound	☐	☐
gunshot wound	☐	☐
Burn	☐	☐
other serious injury	☐	☐

Questions		0	1	2	3	4
10.	Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down in the past 6 months since your discharge from the hospital?	No				Yes

TOTAL MODIFIED (6 month) AUDIT SCORE _____

How successful have you been making changes with your drinking, compared to before your injury?

Scale:

1	2	3	4	5
Little to No Change	Some Change	Moderate Change	Many Changes	Totally Quit/ Major Change

On a scale of 1-10, how well is your life going at this time?

Scale:

1	2	3	4	5	6	7	8	9	10
Terrible				OK, Fine				Going extremely well	

APPENDIX E: THE TEACHABLE MOMENT COUNSELOR EVALUATION

The Teachable Moment
Counselor Evaluation

PATIENT ID_____

1. **Patient Resistance at Beginning of BI (circle what best fits)**

1	2	3	4	5
Little to No Resistance	Mild Resistance	Moderate Resistance	Medium-High Resistance	Very High Resistance

2 **Patient Resistance at End of BI (circle what best fits)**

1	2	3	4	5
Little to No Resistance	Mild Resistance	Moderate Resistance	Medium-High Resistance	Very High Resistance

3. **Did the patient make a commitment to change?**

YES **NO**

4. **Did the patient create a change plan?**

YES **NO**

5. **Was the patient referred to a specialist?**

YES **NO**

6. **Overall rating of the conversation with patient?**

1	**2**	**3**	**4**	**5**
Very easy	Somewhat easy	Moderate	Somewhat Difficult	Very Difficult

Counselor:

_____

APPENDIX F: IRB APPROVAL LETTER

UNC CHARLOTTE
Research and Economic Development
Office of Research Compliance
9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.1876 f/ 704.687.0980 http://research.uncc.edu/compliance-ethics

Institutional Review Board (IRB) for Research with Human Subjects

Approval of Exemption

Protocol #	**16-07-05**			
Title:	**The Difference Between Violently and Nonviolently Injured Trauma Patients and the Factors among Violently Injured Trauma Patients Following a Brief Alcohol Counseling Intervention**			
Date:	**8/2/2016**			
Responsible Faculty	**Dr.**	**Susan**	**Furr**	**Counseling**
Investigator	**Ms.**	**Leigh Zick**	**Dongre**	**Counseling**

The Institutional Review Board (IRB) certifies that the protocol listed above is exempt under category 4 (45 CFR 46.101).

Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

This approval will expire one year from the date of this letter. In order to continue conducting research under this protocol after one year, the "Annual Protocol Renewal Form" must be submitted to the IRB. Please note that it is the investigator's responsibility to promptly inform the committee of any changes in the proposed research, as well as any unanticipated problems that may arise involving risks to subjects. Amendment and Event Reporting forms are available on our web site: http://research.uncc.edu/compliance-ethics/human-subjects/amending-your-protocol or http://research.uncc.edu/compliance-ethics/human-subjects/reporting-adverse-events

M. Exum 8/5/16

Dr. M. Lyn Exum, IRB Chair Date