

Exploratory Analysis of Predictors Effecting Suicidal Thinking among Inmates Participating in a Prison Treatment Program

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Abstract: In this study, we use a retrospective case–control study design, to compare our outcomes of interest among inmates who have self-reported suicidal ideations (cases) with inmates who do not report suicidal ideations (controls). The sample group included participants admitted into prison treatment programs who have a co-occurring substance abuse and mental disorders. In our multivariate model analyses, we will introduce control variables to understand the magnitude of effect and directionality that control variables, such as demographic and criminal history variables, have in association with our outcome of interest, suicidal ideations. Our results indicate that individuals with stable housing have significantly lower odds of demonstrating suicidal ideations. Finally, we found that individuals with prior weapons offenses and psychiatric hospitalization have higher odds of demonstrating suicidal ideations. We believe these results have implications for the development of research and theory.

Keywords: Suicidal-ideations, incarceration, crime, psychiatric history.

1. INTRODUCTION

In this study, we are interested in conducting an exploratory analysis of inmates participating in a substance abuse treatment program that are expressing suicidal ideations by examining their socio-demographic characteristics, criminal history, and psychiatric history. This study is important because it provides empirical evidence of how our predictor variables of interest can be linked to inmates expressing suicidal ideations. In our discussion section, we will explore how social and public health policies are being mediated through the prison system which is encroaching on all spheres of inmate experiences including public health issues, such as, mental health and addiction treatment. Finally, we will examine how more theoretical discourse is needed to understand the broader social factors that are driving suicidal behaviors among inmates in incarceration using Durkheim's (1897) conceptualization of fatalistic suicide within total institutions (Goffman, 1958; Goffman, 1961).

2. LITERATURE REVIEW

Previous studies have identified and replicated several socio-demographic characteristics that are common predictors of suicide risk in men and women throughout the criminal justice systems in western countries. However, few research studies have examined whether females have similar sociodemographic characteristics linked to suicide risk in eastern countries. Zhong *et al.* (2019) examined

several socio-demographic variables that correlate to suicide risk among imprisoned females in the Hunan Providence of China.

In the research conducted by Zhong *et al.* (2019), they found that 20% of female inmates reported recent suicide risks and 37% reported mental health problems out of 2709 prisoners. Age differences were linked to variation in suicide risks (e.g. low-, moderate-, or high-suicidal risk). Additionally, Zhong *et al.* (2019) conducted a logistic regression and found that the following variables have statistically significant odds-ratio for predicting risk for suicide among female inmates: educational levels, employment, marital status, history of drug use, violent offending, family history of mental disorders, history of hospitalization, and mental health problems. Interestingly, the results published by Zhong *et al.* (2019) are consistent with research on risk-factors for suicidal ideation among inmates in western countries.

Typically, research that focuses on inmate suicide is mainly concerned with the impact of socio-demographic characteristics, risk factors, and consequences of suicidal ideation and suicide attempts among male prisoners only. However, minimal research has been conducted to understand the role that socio-demographic characteristics, risk factors, and consequences of suicidal ideation has on female prisoners serving life sentences. Dye & Aday (2013) examined the experiences of female inmates serving life by collecting self-report survey data on suicidal thoughts and suicide attempts, the extent of suicidal thoughts before incarceration, the extent of suicidal thoughts or ending one's life while serving a life sentence, and how certain relationships (e.g. pre-

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prison victimization, prison adjustment factors, prison and family support, mental health factors, and time served associated with suicide thoughts) change pre-prison verses current suicidal ideation while serving a life sentence.

Findings from the study conducted by Dye & Aday (2013) indicate that those female inmates who had attempted suicide pre-prison and consistently thought of suicide pre-prison had also demonstrated suicidal ideation while currently incarcerated. Those who did not have suicide thoughts or attempts before prison, did not self-report suicidal ideation while incarcerated. Furthermore, an increase in family social support decreased risk for suicidal ideations, having no social support increased suicide ideation, and reporting good mental health correlated with decreased risk for suicidal ideations. Additionally, Dye & Aday (2013) found that relationship factors correlated to risk for suicidal ideations. More specifically, early traumatic physical, sexual, and emotional abuse before incarceration was linked to risk for suicidal ideations while incarcerated. This study is important because the results indicate that females who serve life sentences with several pre-prison risk-factors have an increased likelihood of presenting suicidal ideations and engaging in suicide attempts while serving their life sentence.

Jeglic *et al.* (2013) discuss how suicide is the third leading cause of death in prison. Previous research reported by Jeglic *et al.* (2013) examined how individuals incarcerated for violent crimes and history of psychological issues have higher rates of suicidal ideation. According to Jeglic *et al.* (2013) there is a gap in research with regards to suicide attempts among incarcerated sex offenders. Jeglic *et al.* (2013) examined whether rates of suicidal behavior while currently incarcerated are correlated to socio-demographic characteristics, psychosocial risk-factors, and pre-incarceration suicide attempts. Furthermore, the researchers try to understand factors contributing to suicide attempts while incarcerated. Jeglic *et al.* (2013) examined a sample of sex offenders ages 13 to 85, and modeled data using variables related to demographic and psychosocial characteristics, which includes ethnicity, employment status prior to incarceration, reported history of physical/sexual abuse, family history, psychiatric history, offense history, victim characteristics, institutional behavior, and risk factors associated with sexual offenses recidivism.

Jeglic *et al.* (2013) found that incarcerated sex offenders who were abused as children, were more

likely to attempt suicide than those who were not. This finding is interesting because it provides support for the theory of intergenerational transmission of violence and abuse by Widom (1992). This study also supports previous research findings that indicate that psychiatric problems and intellectual impairment increases the risk for incarcerated sex offenders attempting suicide. Sex offenders mainly had higher risk for suicidal ideations and suicide attempts if they previously experienced suicidal ideation or attempts pre-incarceration. Interestingly, no statistically significant differences were found in suicide attempt status between sex offenders who targeted children and those who perpetrated sex offenses against adults.

The body of research examining the association between drug addiction and suicide has produced mixed results that are inconclusive. Recently, studies have analyzed whether drug addiction rates correlate to suicide rates when being moderated by demographic variables. Dragisic *et al.* (2015) examined whether certain demographic characteristics and risk-factors associated with heroin and opiate addicts are predictors of suicide attempts.

Dragisic *et al.* (2015) collected data from 200 participants addicted to heroin and opiates. The participants were split into two groups: Group 1, attempted suicide, and Group 2, never attempted suicide. The variables of interest in this study are related to socio-demographic data, psychiatric heredity, addiction characteristics, and on judicial issues. Additionally, the researchers used the Minnesota Multiphasic Personality Inventory (MMPI-2) to assess the personality characteristics of participants.

The results of this study indicate that individuals addicted to heroin and opiates who have a history of suicidal attempts are unmarried and divorced. Addiction duration and the duration of intravenous use among participants who attempted suicide is longer compared to those who do not have a history of suicide attempts. Dragisic *et al.* (2015) found that the primary risk factors for suicide attempts included having a family history of suicide attempts, a family history of psychotic disorders, and the participant presenting a hypersensitive personality structure. More research is needed to examine whether individuals with a co-morbid diagnosis of mental illness and substance use addiction are self-medicating to cope with intrapersonal and/or interpersonal psychological stressors (e.g. loneliness and divorce). Furthermore, ongoing research is needed to determine whether individuals with co-

morbid disorders receiving a clinical diagnosis, psychiatric medications, and treatment will demonstrate reductions in drug use, presentation of symptoms, and attempted suicides (Dragisic *et al.*, 2015).

Although there exists a considerable body of knowledge about common socio-demographic variables associated with inmate risk for suicide in correctional settings, there exists little research on methods used for attempting suicide in the prison context and the corresponding lethality of the incidents. Magaletta *et al.* (2008) conducted an exploratory study that aimed to measure the methods and lethality of suicide attempts by inmates.

Magaletta *et al.* (2008) examined a sample of 205 male prisoners who have a documented history of suicide attempts from 1998 to 2000. Using various pieces of data collected from documented suicide attempts among male inmates, The Lethality of Suicide Attempt Rating Scale (LSARS) is a measurement instrument that indicates likelihood of death by suicide on a scale from one to nine. One, being the least likely to die, and nine being the most likely to die which allowed for the examination of attempted suicide dynamics (e.g. time, place, & method).

Magaletta *et al.* (2008) found that more than half of the suicide attempts occurred when the inmate was placed in a segregated housing unit, seven percent of the suicide attempts were when there was increased supervision, and 37.1 percent of the suicide attempts occurred in general population. Mental health indicators were associated with two-thirds of suicide attempts, nine percent were from family issues, and eight percent were from prison environment issues (Magaletta *et al.*, 2008).

Using the LSARS measurement instrument, statistical results demonstrate that on average the lethality score was 3.5 out of 9, with over 60 percent of cases being less than the average. Furthermore, results from a Regression analysis of LSARS scores was used to examine suicide attempt lethality, while controlling for inmates' history of violence in prison, conviction for violent crime, malingering, expressed desire for transfer, adjustment to institution, prior help seeking, staff interactions, inmate mental health, and substance abuse factors (Magaletta *et al.*, 2008). The results from this study indicate that when controlling for all the other independent variables in the model, the overall model accounted for 13% of the variance in the suicide attempt lethality rating. Based on the results

from their study, Magaletta *et al.* (2008) recommends that prison administrators prioritize policies that promote mental health risk assessments and clinical interventions for suicidal inmates as a matter of public health concern.

The association between aggression and suicide attempts is important to understand because it allows researchers closely inspect potential causal factors driving both violence against others and violence against oneself. Swogger *et al.* (2014) examined the correlation between aggression and suicide attempts among criminal offenders. In their study, aggressive acts are categorized between reactive- and proactive-aggression. Reactive aggression is defined as a response to a threat with an immediate action to defend oneself against perceived physical or psychological harms. Proactive aggression is a premeditated response with intent to offend using physical or psychological harm. Swogger *et al.* (2014) state that the different categorical types of aggression and sub-aggression is vital for conceptualizing the predictor variables associated with violence among criminal offenders and high-risk populations. Swogger *et al.* (2014) hypothesizes that there is a link between individuals expressing reactive- and proactive-aggression and risk for suicide.

Swogger *et al.* (2014) did not find a link between proactive aggression and risk for suicide but did find that a significant relationship between measuring reactive aggression and risk for suicide. Swogger *et al.* (2014) believes that impulsivity may be the causal factor driving both reactive aggression and suicide attempts. The researchers describe a cognitive-behavioral model in which impulsive individuals who exhibit aggressive behaviors also have a higher likelihood of acting on suicidal thoughts because they are more likely to transition from thoughts to behavioral actions due to a limited capacity for emotional regulation and coping skills for managing stressful triggers or events. Furthermore, Swogger *et al.* (2014) believe that correctional supervisors in the criminal justice system can develop mental health risk assessments and interventions for individuals who are at higher risk for suicide and can identify stressors that trigger reactive aggressive behaviors in individuals.

3. RESEARCH QUESTION

We are interested in examining whether predictors variables, identified in the literature review, allows for the construction of an exploratory model for predicting

suicidal ideations among inmates. More specifically, our research questions asks whether our variables of interest: socio-demographic characteristics, criminal history, and psychiatric history can predict our outcome measure of suicidal ideations? We hypothesize that our exploratory model will allow us to measure magnitude and direction of the relationship between our predictor variables and outcome variable of interest, suicidal ideations.

4. METHODS

4.1. Data

For this study, we conducted a secondary-data analysis of the Criminal Justice Drug Abuse Treatment Studies (CJDATS) intake interview and the Criminal Justice Co-Occurring Disorder Screening Instrument (CJ-CODSI), 2002-2008 (Sacks & Melnick, 2011). This data is publicly available and accessible using the website: Inter-university Consortium for Political and Social Research (ICPSR 27963).

4.2. Sample

The sample group included participants admitted into prison treatment programs who have a co-occurring substance abuse and mental disorders. Sacks and Melnick (2011) state that the sample distribution ensured the inclusion of women and minorities. The participant data used in this secondary-data analysis were collected from inmates admitted to prison-based substance abuse treatment programs across four research centers: NDRI Rocky Mountain in Colorado (N = 117), Lifespan at Brown University in Rhode Island (N = 75), the Institute for Behavioral Research at Texas Christian University in Texas (N = 60), and the Integrated Substance Abuse Programs at UCLA in California (N = 72). The original study aimed to develop a reliable and valid brief screening instrument to identify offenders with co-occurring disorders for use in the criminal justice system (Sacks & Melnick, 2011).

4.3. Study Design

In this study, we use a retrospective case-control study design, to compare our outcomes of interest among inmates who have self-reported suicidal ideations (cases) with inmates who do not present this outcome (controls). The retrospective case-control study design will allow us to compare how frequently the participants in this study have been exposed to specific risk factors of interest (i.e. social demographics, criminal history, and psychiatric

symptoms) in each group in order to analyze the relationship between our specified risk-factors and our outcome of interest, suicidal ideations. Case-control studies are observational and designed to estimate the odds of an outcome occurring by comparing risk factors between cases and controls. No experimental intervention was attempted on participants in this study. Additionally, in our multivariate model analyses we will introduce control variables in order to understand the magnitude of effect and directionality that control variables have in association with our outcome of interest.

4.4. Measures

The secondary-data dataset included responses collected from an interviewer questionnaire, which included multiple substance abuse and mental health screening instruments. More specifically, the participant data was collected using the CJDATS intake interview and CJ-CODSI screening battery which recorded their demographic history, drug use and alcohol use history, criminal history, psychiatric history, hospitalization history, treatment, and service information.

4.5. Outcome Variables

The outcome variable of interest in this study is *Ever Have Thoughts of Suicide*. It is a nominal and binary coded variable (1 = Yes, did have thoughts of suicide and 0 = No, did not have thoughts of suicide).

4.6. Predictor Variables

The predictor variables of interest in this study are all nominal, binary coded, and separated into four distinct groups: (1) Demographic variables, (2) Criminal History variables, and (3) Psychiatric History variables.

The Demographic variables include: *Gender* (1 = Male and 0 = Female), *Race* (1 = White and 0 = Non-White), *Current Living Situation* (1 = Own or Rent Apartment/Home and 0 = Homeless or Institutionalized), *Marital Status* (1 = Married and 0 = Non-Married), and *High School Graduate* (1 = Yes, High School Diploma or GED and 0 = No, High School Diploma or GED).

The Criminal History variables include: *Number of Times Committed Illegal Drugs Lifetime* (1 = One or More Times and 0 = None), *Number of Times Committed Prostitution/Pimping Lifetime* (1 = One or More Times and 0 = None), *Number of Times Committed Arson Lifetime* (1 = One or More Times and

0 = None), and *Number of Times Committed Weapons Offense Lifetime* (1 = One or More Times and 0 = None).

The Psychiatric History variables include: *Diagnosed with Depression* (1 = Yes and 0 = No), *Lifetime History of Psychosis Symptoms* (1 = Yes, has a lifetime history of one or more psychotic symptoms and 0 = No, has no lifetime history of psychotic symptoms), *Diagnosed with Schizophrenia* (1 = Yes and 0 = No), *Ever Needed Mental Health Treatment* (1 = Yes and 0 = No), *Ever Needed Emergency Room for Psychiatric Illness* (1 = Yes and 0 = No), and *Number of Times Hospitalized for Psychiatric Illness* (1 = One or More Times and 0 = None).

4.7. Analysis Plan

For this study, we will begin by providing an exploratory analysis of our predictor and outcome variables using descriptive statistics, such as, frequency and percentages. Next, we will be conducting bivariate statistical analysis using the Chi-Square test on the outcome variable for suicidal ideations with our predictor variables for the purpose of identifying moderately or statistically significant relationships with an alpha value of less than 0.10.

Based on the extant literature, we will be using the predictor variables that are theoretically relevant by creating a multivariate model to specify our hierarchical logistic regression for predicting suicidal ideations. A hierarchical regression is used when there is a lack of independence across levels of clustered data.

Sung and Richter (2006) report that the hierarchical regression technique can control for temporal and spatial clustering of data when testing predictive models using data with similar background characteristics. A lack of independence across levels of clustered data can result in incorrect point estimates, confidence intervals, standard errors, and p values, which are threats to both internal and external validity (Sung and Richter, 2006). The output that will be reported and interpreted for the logistic regression analysis includes the -2 log likelihood for the fully reduced model and the related χ^2 for the full model and related significance levels to determine if inputting independent variables improves the model fitness. The results that are reported and interpreted include the odds-ratios and significance levels for each predictor variable with an alpha value of less than 0.10.

4.8. Missing Data

The descriptive statistics in the results section present the percentage of predictor and outcome variables with missing data. We did not attempt to impute data for the predictor or outcome variables because the data was Missing Completely at Random (MCAR). MCAR means that there is no association between the missing data and observed values. We did not identify any systematic relationship between missing data and available data for the available cases in this dataset, which we found did not make some data more likely to be missing than others. We found no evidence of selection bias between cases with missing data and available data in our study. Therefore, we conclude that our study will maintain external- and internal- validity due to the low percentage of missing data, MCAR. The listwise deletion of cases with missing data is sufficient for performing our exploratory analysis and the interpreting our results (Porter & Ecklund, 2012).

5. RESULTS

In Table 1, we present the descriptive statistics for our demographic predictor variables. For the *Gender* variable, 33.5 percent of respondents are Female and 66.4 percent are Male. For the *Race* variable, 42.0 percent of respondents are Non-White and 53.7 percent are White. For the *Current Living Situation* variable, 45.4 percent are Homeless or Institutionalized and 54.6 percent Own or Rent an Apartment/Home. For the *Marital Status* variable, 65.7 percent are Not Married and 34.0 percent are Married. For our *High School Graduate* variable, 63.9 percent of respondents are categorized as 'No' and 36.1 percent are 'Yes' for having a High School Diploma or GED.

In Table 2, we present the descriptive statistics for our criminal history predictor variables. For the variable *Number of Times Committed Illegal Drugs Lifetime*, 2.5 percent of respondents indicated 'None' and 96.3 percent indicated 'One or More Times'. For the variable *Number of Times Committed Prostitution/Pimping Lifetime*, 88.0 percent of respondents indicated 'None' and 11.7 percent indicated 'One or More Times'. For the variable *Number of Times Committed Arson Lifetime*, 94.4 percent of respondents indicated 'None' and 5.6 percent indicated 'One or More Times'. For the variable *Number of Times Committed Weapons Offense Lifetime*, 66.0 percent of respondents indicated 'None' and 34.0 percent indicated 'One or More Times'.

Table 1: Descriptive Statistics of Demographic Variables

Exploratory Variables	N	%
<i>Total observations</i>	324	100
<i>Gender</i>		
Female	109	33.6
Male	215	66.4
Missing	0	0.0
<i>Race</i>		
Non-White	136	42.0
White	174	53.7
Missing	14	4.3
<i>Current Living Situation</i>		
Homeless or Institutionalized	147	45.4
Own or Rent Apartment/Home	177	54.6
Missing	0	0.0
<i>Material Status</i>		
Not Married	213	65.7
Married	110	34.0
Missing	1	0.3
<i>High School Graduate</i>		
No	207	63.9
Yes	117	36.1
Missing	0	0.0

Table 2: Descriptive Statistics of Criminal History Variables

Exploratory Variables	N	%
<i>Total observation</i>	324	100
<i>Numbers of Times Committed Illegal Drugs Lifetime</i>		
None	8	2.5
One or More Times	312	96.3
Missing	4	1.2
<i>Numbers of Times Committed Prostitution/Pimping Lifetime</i>		
None	285	88.0
One or More Times	38	11.7
Missing	1	0.3
<i>Numbers of Times Committed Arson Lifetime</i>		
None	306	94.4
One or More Times	18	5.6
Missing	0	0.0
<i>Numbers of Times Committed Weapons Offense Lifetime</i>		
None	214	66.0
One or More Times	110	5.6
Missing	0	0.0

Table 3: Descriptive Statistics of Psychiatric History Variables

Exploratory Variables	N	%
<i>Total observation</i>	324	100
<i>Diagnosed With Depression</i>		
No	174	53.7
Yes	149	46.0
Missing	1	0.3
<i>Lifetime History of psychosis symptoms</i>		
No, has no lifetime history of psychotic symptoms	139	42.9
Yes, has a lifetime history of one or more psychotic symptoms	184	56.8
Missing	1	0.3
<i>Diagnosed With Schizophrenia</i>		
No	273	84.3
Yes	49	15.1
Missing	2	0.6
<i>Ever Needed Mental Health treatment</i>		
No	131	40.4
Yes	192	59.3
Missing	1	0.3
<i>Ever Needed Emergency Room for psychiatric Illness</i>		
No		
Yes	270	83.3
Missing	53	16.4
<i>Number of Times Hospitalized for psychiatric Illness</i>		
None	262	80.9
One or more Times	61	18.8
Missing	1	0.3

In Table 3, we present the descriptive statistics for our psychiatric history predictor variables. For the variable *Diagnosed with Depression*, 53.7 percent of respondents indicated 'No' and 46.0 percent indicated 'Yes'. For the variable *Lifetime History of Psychosis Symptoms*, 42.9 percent of respondents indicated 'No, has no lifetime history of psychosis' and 56.8 percent indicated 'Yes, has a lifetime history of one or more psychotic symptoms'. For the variable *Diagnosed with Schizophrenia*, 84.3 percent of respondents indicated 'No' and 15.1 percent indicated 'Yes'. For the variable *Ever Needed Mental Health Treatment*, 40.4 percent of respondents indicated 'No' and 59.3 percent indicated 'Yes'. For the variable *Ever Needed Emergency Room for Psychiatric Illness*, 80.3 percent of respondents indicated 'No' and 16.4 percent indicated 'Yes'. For the variable *Number of Times Hospitalized for Psychiatric*

Illness, 80.9 percent of respondents indicated 'None' and 18.8 percent indicated 'One or More Times'.

Table 4: Descriptive Statistics of Suicidal Ideations Outcome Variable

Exploratory Variables	N	%
<i>Total observation</i>	324	100
<i>Ever Have Thoughts of Suicide</i>		
No	239	73.8
Yes	81	25.0
Missing	4	1.2

In Table 5, we present the descriptive statistic for our suicidal ideations outcome variable. For the variable *Ever Have Thoughts of Suicide*, 73.8 percent

Table 5a: Bivariate Analysis of Ever Have Thoughts of Suicide

	Ever Have Thoughts of Suicide	
	No	Yes
Gender**		
Female	70	37
Male	169	44
Race		
Non-White	102	37
White	124	44
Current Living Situation**		
Homeless or Institutionalized	98	48
Own or Rent Apartment/Home	141	33
Material Status		
Not Married	155	56
Married	83	25
High School Graduate		
No	152	52
Yes	87	29
Numbers of Times Committed Illegal Drugs Lifetime		
None	5	1
One or More Times	232	78
Numbers of Times Committed Prostitution/Pimping Lifetime		
None	218	63
One or More Times	20	18
Numbers of Times Committed Arson Lifetime		
None	230	72
One or More Times	9	9

†p<0.10* p<0.05,**p<0.01,***p<0.0001.

Table 5b: Bivariate Analysis of Ever Have Thoughts of Suicide

	Ever Have Thoughts of Suicide	
	No	Yes
#Times Committed Weapons Offense Lifetime†		
None	164	46
One or More Times	75	35
Diagnosed With Depression**		
No	159	13
Yes	80	68
Lifetime History of psychosis symptoms**		
No, has no lifetime history of psychotic symptoms	155	23
Yes, has a lifetime history of one or more psychotic symptoms	124	58
Diagnosed With Schizophrenia***		
No	123	7
Yes	116	74
Ever Needed Mental Health treatment***		
No	131	40.4
Yes	192	59.3
Ever Needed Emergency Room for psychiatric Illness***		
No	223	44
Yes	16	37
Number of Times Hospitalized for psychiatric Illness***		
None	219	39
One or more Times	20	41

†p<0.10* p<0.05,**p<0.01,***p<0.0001.

of respondents stated 'No' and 25.0 percent responded 'Yes' to having ever attempted suicide.

In Table 5a, we present the results of our Chi-Square Test of Independence between our predictor variables and our outcome variable, *Ever Have Thoughts of Suicide*. A Chi-Square Test of Independence was performed and the results demonstrate that there was a significant association between *Gender* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 7.3, p = .007$. There was a significant association between *Current Living Situation* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 8.1, p = .004$. There was a significant association between *Number of Times Committed Prostitution/Pimping Lifetime* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 319) = 11.0, p = .001$. There was a significant association between *Number of Times Committed Arson Lifetime* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 6.1, p = .013$.

In Table 5a, we present the results of our Chi-Square Test of Independence between our predictor variables and our outcome variable, *Ever Have Thoughts of Suicide*. A Chi-Square Test of Independence was performed and the results

demonstrate that there was a significant association between *Diagnosed with Depression* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 62.0, p < .001$. There was a significant association between *Lifetime History of Psychosis Symptoms* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 9.6, p = .002$. There was a significant association between *Diagnosed with Schizophrenia* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 319) = 21.2, p < .001$. There was a significant association between *Ever Needed Mental Health Treatment* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 46.0, p < .001$. There was a significant association between *Ever Needed Emergency Room for Psychiatric Illness* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 320) = 66.5, p < .001$. There was a significant association between *Number of Times Hospitalized for Psychiatric Illness* and *Ever Have Thoughts of Suicide*, $X^2(1, N = 319) = 72.3, p < .001$.

In Table 6, we conducted a hierarchical logistic regression analysis to examine the odds-ratio of predictor variables on our outcome variable, *Ever Have Thoughts of Suicide*. In particular, we are interested in examining the magnitude and direction of the relationship of our predictors to the outcome variable. We found that our final logistic regression model is

Table 6: Hierarchical Logistic Regression Analysis of Ever Have Thoughts of Suicide

	Model 1 Exp (B)	Model 1 Exp (B)	Model 1 Exp (B)
Gender (1=Male)	0.54	0.43*	0.83
Race (1=White)	1.05	1.06	0.71
Current Living Situation (1=Own or Rent or Apartment/Home)	0.50	0.51*	0.44*
Material Status (1=Married)	1.10	1.12	1.44
High School Graduate (1=Yes)	-	1.21	1.18
Numbers of Times Committed Illegal Drugs Lifetime (1=one or more Times)	-	2.10	2.97
Numbers of Times Committed Arson Lifetime (1=one or more Times)	-	1.79	0.95
Numbers of Times Committed Arson Lifetime (1=one or more Times)	-	2.60 [†]	1.28
Times Committed Weapons Offense Lifetime (1=one or more Times)	-	2.20*	2.98**
Diagnosed With Depression (1=Yes)	-	-	3.66**
Lifetime History of psychosis symptoms (1=Yes)	-	-	0.88
Diagnosed With Schizophrenia (1=Yes)	-	-	2.32 [†]
Ever Needed Mental Health treatment (1=Yes)	-	-	4.83**
Ever Needed Emergency Room for psychiatric Illness (1=Yes)	-	-	2.63 [†]
Number of Times Hospitalized for psychiatric Illness (1=one or more Times)	-	-	4.71**
2 Log Likelihood Ratio	209.29	315.02	330.68
Chi-square	133.94***	28.21**	12.55*

[†]p<0.10 *p<0.05, **p<0.01, ***p<0.0001.

statistically significant for predicting the outcome variable, *Ever Have Thoughts of Suicide* ($p < 0.05$). In particular, we are interested in comparing the strength of our predictor variables when entering them into our final model. We found that respondents who indicated their *Current Living Situation* is Owning or Renting a Apartment/Home, have a decreased odds of 0.44 times of reporting 'Yes' for *Ever Have Thoughts of Suicide* ($p < 0.05$). Respondents who indicated 'One or More Times' for the *Number of Times Committed Weapons Offense Lifetime*, have a increased odds of 2.98 times of reporting 'Yes' for *Ever Have Thoughts of Suicide* ($p < 0.01$). Respondents who indicated 'Yes' that they have been *Diagnosed with Depression*, have a increased odds of 3.66 times of reporting 'Yes' for *Ever Have Thoughts of Suicide* ($p < 0.01$). Respondents who indicated 'Yes' that they *Ever Needed Mental Health Treatment* have a increased odds of 4.83 times of reporting 'Yes' for *Ever Have Thoughts of Suicide* ($p < 0.01$). Finally, Respondents who indicated 'One or More Times' as the *Number of Times Hospitalized for Psychiatric Illness*, have a increased odds of 4.71 times of reporting 'Yes' for *Ever Have Thoughts of Suicide* ($p < 0.01$).

6. CONCLUSION

The results from our exploratory analysis of suicidal ideations demonstrate that several variables that we inputted into our final model are statistically significant for predicting suicidal ideations and are consistent with findings from the previous literature. For example, we found that having stable housing reduces the likelihood of demonstrating suicidal ideations. This finding is important because it highlights the importance of the harm reduction model of "Housing First" that is built on the assumptions that interventions for psychiatric symptoms and substance use issues can be managed and treated more effectively when individual have stable and safe housing conditions (Collins *et al.*, 2016).

Additionally, we found evidence to suggest that respondents who indicated that they have history of committing weapons offenses are statistically significantly more likely to demonstrate suicidal ideations replicates previous findings (Swogger *et al.*, 2014). This finding is important because it highlights how risk assessments seeking to identify risk-factors for suicidal behaviors should also assess predictor variables related to history of violent and aggressive behaviors. Having a history of violent behavior may indicate that an individual not only disregards the lives

of others but may disregard the value of their own life as well. Previous research has repeatedly demonstrated how incarcerated veterans who have served in hostile war zones and suffered post-traumatic stress disorder (PTSD) have high rates of suicide (Wortzel *et al.*, 2009). Furthermore, among those individuals who are incarcerated the association between aggression, violence, and suicide may have underlying neurological and psychiatric issues that can be linked to the conditions of confinement, such as, being placed in solitary confinement or administration segregation, which can exacerbate untreated and underlying health issues (Chintakrindi *et al.*, 2021).

We found strong evidence to suggest that psychiatric health history continues to be a statically significant predictor of suicidal ideations. For example, we found that inmates with a history of depression, history of mental health treatment, and history of being hospitalized for psychiatric illness are robust predictors of suicidal ideations. We found moderately significant evidence that having a diagnosis for schizophrenia and emergency hospitalization for psychiatric illness is predictive of suicidal ideations. Our findings are consistent with the previous literature that repeatedly demonstrates that co-occurring disorders is the strongest predictor of suicidal ideations among inmates experiencing incarceration and those reentering the community after serving time (Verona *et al.*, 2001; Blaauw *et al.*, 2005; Rivlin *et al.*, 2010; Barry *et al.*, 2018).

6.1. Theoretical Implications

Although there exists considerable evidence from our exploratory analysis and previous research about the common demographic characteristics, criminological history, and psychosocial history of inmates who demonstrate suicidal ideations or have committed suicide, there remains little or no theoretical progress for explaining the macro-level societal or material factors that creates the conditions for alienation and social exclusion among inmates. We believe that a more nuanced theoretical explanation of suicide in incarceration settings and among the inmate population is needed for understanding the social structural issues that produces self-inflicted violence.

Durkheim's (1897) theory and typologies of suicide hypothesize that sociological variables are consistently predictive of macro-level rates of suicide. This theory of suicide continues to remain foundational and can be applied to exploring how socio-demographic

characteristics and criminological history connects with rates of suicidal ideation among inmates who are incarcerated. Durkheim's (1897) theory of suicide is one of the first empirical tests of how aggregate level analysis of sociological variables are correlated with individual-level suicidal behavior. Durkheim (1897) developed and empirically examined the theory by describing how varying societal conditions produces four distinct forms of suicidal behavior in individuals. Durkheim categorized the varying types of suicide as egoistic, altruistic, anomic, and fatalistic.

Of the four different types of suicide that Durkheim (1897) theorized and examined, we are interested in his theorization of fatalistic suicide, because of its distinctive conceptualization that can be applied to factors driving suicidal ideations and attempts among the incarcerated population. Durkheim (1897) conceptualized fatalistic suicide within society as a pattern of suicidal behavior caused by excessive social regulations, restrictive individuation, and feelings of despair and hopelessness that is the result of intense psychic and physical coercion by external authorities. Durkheim (1897) argues that excessive regulation emerges when the authorities are seeking to control and censor beliefs, intellectual discourse, and social interaction through excessive surveillance, regulation, structural inequality, and violent oppression (Mueller et al., 2021). Furthermore, all the characteristics associated with the conceptualization of fatalistic suicide, as outlined by Durkheim (1897), can be observed being directly applied in the contemporary jail, prison, and immigration detention systems as a means for prison administrators to control the life, quality of experiences, and labor conditions of inmates using the "microphysic of power" (Wacquant, 2000; Foucault, 2012; VanderPyl & Eisen, 2022).

6.2. Limitations

The limitations for this study include missing data, which limits the number of cases that can be analyzed and presented in our exploratory model of suicidal ideations. Although, we did not impute missing variables, instead we listwise deleted cases from our analysis that contained missing variables. Furthermore, we conducted an analysis of percentage of missing data from both our predictor and outcome variables and we found the percentages to be low enough not to impact the statistical power, reliability, and validity of our results (Porter & Ecklund, 2012).

6.3. Future Research

We believe that future research should include a more detailed examination of outcomes related to suicidal ideations and behaviors using a theoretical model that provides a closer examination of how macro-level social conditions and institutional administrative policies within incarceration settings may contribute to individual-level suicidality rather than relying primarily on individual level variables related to demographic characteristics, criminal history, and psychiatric illness history for understanding suicidal ideations. Durkheim's (1897) theory of suicide and his discussion on fatalistic suicide would allow for future researchers to theoretically specify factors that could be inputted into a statistical model for predicting aggregate level suicidal behavior. An examination of Durkheim's (1897) typology of fatalistic suicide would allow researchers to have a better understanding of how repressive social policies (e.g. war on drugs, mandatory minimum sentences, zero tolerance laws, negative credentials and unemployment, undocumented immigrant detention, criminalizing homelessness) combined with the rigid internal operations of total institutions can create the conditions for despair, discontent, and dissatisfaction among inmates with their quality of life when experiencing incarceration (Goffman, 1958; Goffman, 1961).

6.4. Ethical Considerations

The Institutional Review Board at California State University, Stanislaus, designates this study as exempt from review because this study used secondary data that is publicly available from the Inter-university Consortium for Political and Social Research. All identifying information of research participants in this study is unavailable or deidentified in the publicly available datasets (Sacks & Melnick, 2011).

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