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Intentional injury in the U.S. Army: Is a college education the answer?

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Background

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- Intentional injuries typically studied independently of each other
- Identification of common pathways to intentional injury may help target high risk populations for intervention
- Comparison of risk factors across multiple intentional injuries may help clarify etiology

Study Goals:
Finding a Common Pathway

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- Compare demographic and prior health utilization patterns for different intentional injuries
- Compare risk factors for different roles in intentional injury events (perpetrator or victim, harm to self or harm to someone else)
- Use a single comparable study population to examine different types of intentional injuries

Methods: The Data

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Total Army Injury and Health Outcomes Database (TAIHOD)

- Casualty (deaths)
- Army inpatient hospitalizations
- Central Registry (substantiated child & spouse abuse)
- DMDC (personnel)

Methods – Study Population

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- All Active Duty Army, 1971-2005
- Case Control Design
  - Cases: enlisted soldiers with one (single) intentional injury event
  - Controls: enlisted soldiers with no intentional injury event, but who were on active duty at the same time as case. Selected in 2:1 ratio to cases

Model Covariates

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- Demographics
  - Gender, age, rank, time in service, education, race/ethnicity
- Prior Health Care utilization (hospitalization within 1 year prior to event date)
  - Alcohol diagnosis, mental health, injury
- Hazardous Duty Pay
  - Parachute special pay; other special pay

Methods -- Analyses

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- Split Sample
- Logistic Regression analysis
  - Main effects
  - Interactions; backward stepwise approach excluding interactions where p>0.05

Study Population

N = 247,425 (cases = 89,833; controls = 157,592)

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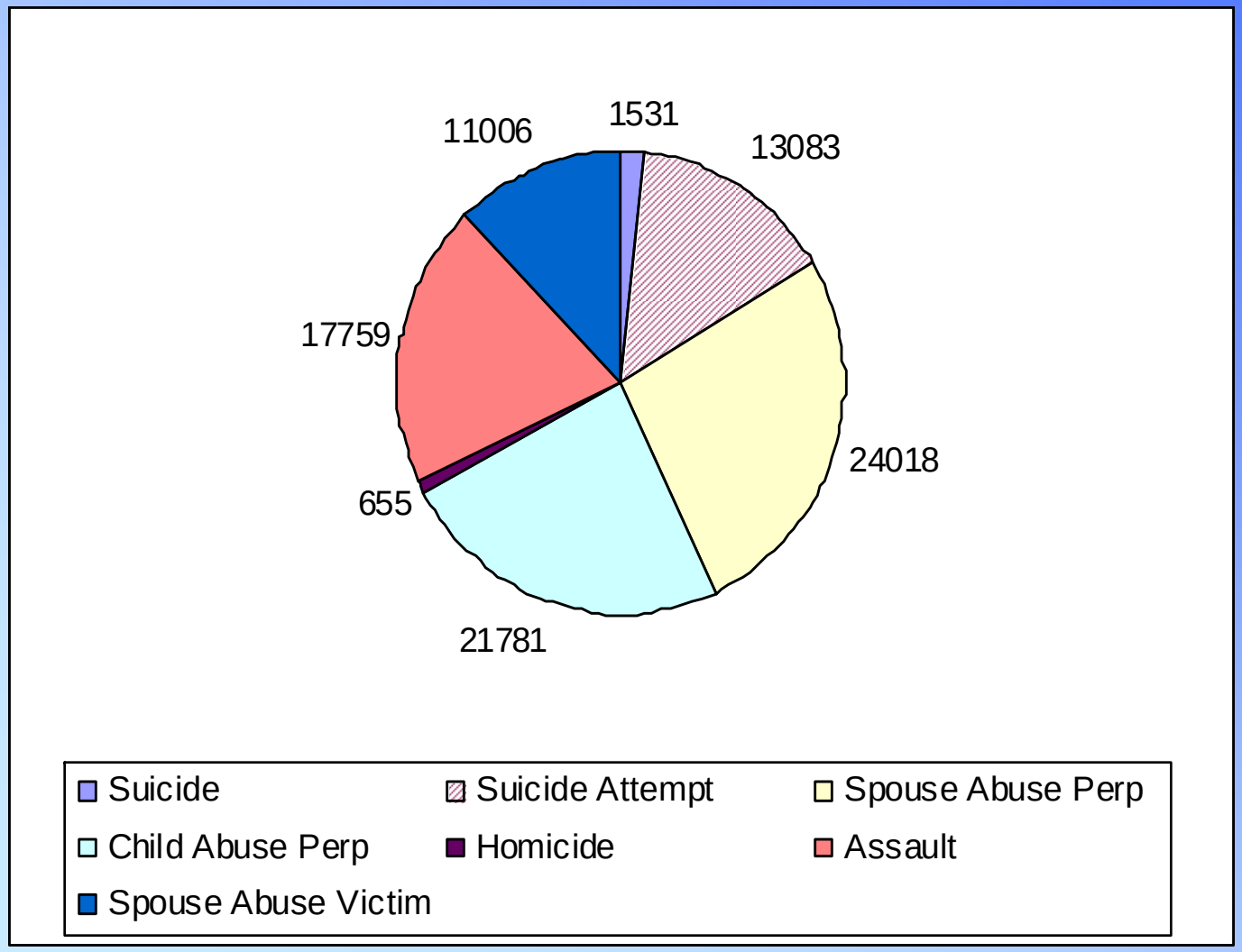

Results – Gender & Age Multivariate LR Models

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Gender & Age	Suicide	Suicide Attempt	Spouse Abuse Perpetrator	Child Abuse Perpetrator	Homicide	Assault Hospital	Spouse Abuse Victim
Women	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Men	3.95* (3.06-5.11)	0.66* (0.66-0.69)	6.75* (6.26-7.29)	1.06* (6.26-7.29)	1.18 (0.94-1.47)	4.80* (4.44-5.20)	0.18* (0.17-0.19)
Age (years)	1.01 (0.99-1.03)	0.97* (0.96-0.98)	1.03* (1.03-1.04)	1.05* (1.04-1.05)	0.96* (0.93-0.99)	0.96* (0.95-0.97)	1.04* (1.03-1.04)

Results –Race & Ethnicity Multivariate LR Models

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Race/ Ethnicity	Suicide	Suicide Attempt	Spouse Abuse Perpetrator	Child Abuse Perpetrator	Homicide	Assault Hospital	Spouse Abuse Victim
White	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Black	0.65* (0.57-0.74)	0.63* (0.60-0.66)	2.63* (2.56-2.72)	1.18* (1.14-1.22)	2.08* (1.76-2.45)	0.96* (0.91-1.00)	1.99* (1.99-2.08)
Hispanic	1.01 (0.81-1.27)	0.81* (0.75-0.89)	1.68* (1.58-1.78)	0.89* (0.82-0.95)	1.13 (0.77-1.67)	0.80* (0.74-0.87)	1.42* (1.30-1.56)
Native American/ Alaskan Native	1.01 (0.54-1.91)	0.98 (0.80-1.22)	2.08* (1.76-2.45)	1.20* (1.00-1.44)	1.63 (0.67-3.96)	1.46* (1.22-1.73)	1.57* (1.26-1.96)
Asian/Pacific Islanders	0.95 (0.65-1.38)	0.60* (0.51-0.71)	1.19* (1.05-1.33)	0.82* (0.73-0.92)	0.81 (0.38-1.71)	0.58* (0.50-0.68)	1.36* (1.18-1.58)
Other	0.88 (0.63-1.23)	0.76* (0.68-0.90)	1.73* (1.59-1.88)	0.97 (0.88-1.07)	1.23 (0.72-2.11)	1.11* (1.00-1.23)	1.71* (1.51-1.93)

Results –Education & Rank Multivariate LR Models

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Education & Rank	Suicide	Suicide Attempt	Spouse Abuse Perpetrator	Child Abuse Perpetrator	Homicide	Assault Hospital	Spouse Abuse Victim
High School or less	1.00	1.00	1.00	1.00	1.00	1.00	1.00
College	**0.81* (0.66-0.99)**	**0.76* (0.69-0.83)**	**0.47* (0.44-0.51)**	**0.71* (0.67-0.75)**	**0.76 (0.54-1.08)**	**0.73* (0.67-0.79)**	**0.56* (0.52-0.61)**
Rank							
E1-E4	1.00	1.00	1.00	1.00	1.00	1.00	1.00
E5-E6	1.25* (1.06-1.48)	0.97 (0.89-1.04)	0.87* (0.85-0.93)	1.28* (1.23-1.34)	1.18 (0.91-1.55)	0.71* (0.67-0.76)	0.85* (0.79-0.90)
E7-E9	1.82* (1.31-2.53)	2.43* (1.99-2.97)	0.35* (0.32-0.38)	0.53* (0.48-0.57)	1.76* (1.03-3.01)	0.80* (0.67-0.94)	0.38* (0.32-0.43)

Results – Hazardous Duty Multivariate LR Models

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Hazardous Duty Pay	Suicide	Suicide Attempt	Spouse Abuse Perpetra-tor	Child Abuse Perpetra-tor	Homicide	Assault Hospital	Spouse Abuse Victim
None (past year)	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parachute and other	0.70* (0.58-0.85)	0.49* (0.45-0.54)	1.03 (0.98-1.08)	0.69* (0.65-0.73)	0.50* (0.35-0.72)	0.77* (0.72-0.81)	1.16* (1.07-1.26)
Other hazard pay	0.50* (0.31-0.81)	0.35* (0.28-0.44)	0.92 (0.83-1.03)	0.77* (0.68-0.86)	0.25* (0.08-0.78)	0.43* (0.36-0.51)	0.91 (0.76-1.10)

Results – Hospitalization Multivariate LR Models

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Hospital-izations	Suicide	Suicide Attempt	Spouse Abuse Perpetrator	Child Abuse Perpetrator	Homicide	Assault Hospital	Spouse Abuse Victim
Alcohol							
No	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	2.43* (1.85-3.22)	2.72* (2.38-3.11)	1.68* (1.50-1.87)	1.32* (1.17-1.50)	1.29* (0.64-2.57)	2.42* (2.12-2.77)	1.09 (0.88-1.36)
Mental Health							
No	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	5.53* (4.45-6.86)	8.82* (8.10-9.61)	2.54* (2.23-2.71)	1.75* (1.58-1.95)	1.15* (1.30-3.57)	1.31* (1.14-1.50)	1.71* (1.49-1.97)
Injury							
No	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	2.08* (2.46-3.37)	1.70* (1.56-1.85)	1.41* (1.33-1.50)	1.16* (1.08-1.24)	1.16* (1.62-2.88)	1.87* (1.75-2.00)	1.20* (1.08-1.33)

Interactions with College Education

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- College education is associated with reduced odds for homicide, suicide and suicide attempt. But, ...
  - College educated individuals with prior psychiatric hospitalization have ***greater*** odds for suicide, homicide and suicide attempt than those without college education
  - The increased odds are most pronounced among women and soldiers with longer time on active duty

Interactions with College Education

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- College education is associated with reduced odds of hospitalization for assault victimization and for spouse abuse victimization or perpetration. But, ...
  - Female gender ***reverses*** association between college education and assault hospitalization—especially for African American women, women receiving parachute pay, & women with longer time in service, (OR >1 & increases with years)
  - College educated soldiers who are African American or E7-E9 rank have ***reduced effect size*** (OR <1 but gets closer to 1) for spouse abuse perpetration or spouse abuse victimization

Limitations

- Cross-sectional study prevents study of causal order.
- Data driven rather than a priori hypotheses motivated testing of interactions
- Healthy worker bias

Conclusion

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- College education associated with decreased odds for intentional injuries
  - Effect reduced by black race, older age, higher rank, & parachute pay
  - Mental health hospitalization associated with a ***reverse in the direction*** of the association between college education and suicide, suicide attempt and homicide & female gender associated with ***reverse in direction*** of association between college education and hospital assault
- Hazardous duty pay associated with reduced odds of intentional injuries
- Mental health, alcohol, or injury hospitalization associated with increased odds of intentional injuries.

Discussion Questions

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- Why is a college education, in conjunction with a prior psychiatric hospitalization, associated with increased odds of suicide, suicide attempt and homicide?
- Why are college educated women at increased risk for assault and, if they have mental health disorders, more likely than men with mental health disorders to be victims of homicide and suicide?
- Why is the association between college education and intentional injury moderated by increasing rank, time in service, and African American race?
- Why does parachute pay moderate the association between college education and intentional injury?