Impact of Prior Alcohol Abuse Symptoms on Depressive Symptoms among Veterans after the 1994 Northridge Earthquake
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Rationale

Most research on the health impact of earthquakes has been cross-sectional, without pre-quake baseline measures.

Alcohol abuse is relatively high among Veterans – e.g. 27% in OEF/OIF.

Alcohol/drug abuse also involved in 30% of Army suicides 2003-9 (NIDA, 2011)

The losses resulting from disasters have an adverse impact on mental health (Norris 2002). Alcohol abuse may contribute to increased distress after a disaster event.
Is there an independent association of prior alcohol abuse with post-earthquake depressive symptoms among Veterans who experienced the Northridge earthquake?
About the Northridge Earthquake:

Occurred on January 17, 1994, 4:30 AM

**6.7 magnitude**

Number of deaths: ~60

Number of injured people: ~7,000

25,000 dwellings became uninhabitable

22,000 people became homeless

~ $44 billion in damages

9 hospitals were severely damaged, & 2,500 inpatient beds were lost
Study Design

Prospective Cohort:

- 1800 users of Sepulveda VA who responded to questionnaires in a pre-quake program evaluation

- Post-quake needs assessment of 1144 Veterans (64% response) began 4 weeks after quake & conducted for 8 weeks (ie, until post-quake week 12)
Post-Earthquake Survey Instrument

• Administered by telephone (up to 6 contact attempts were made)

• 28 items on problems such as meeting basic survival needs (e.g., food or water) physical & mental health needs (e.g., injury, pain, stress), & access to care (e.g., problems obtaining medical care, refilling medications).
Pre-Earthquake Variables

1. Alcohol abuse symptoms (latent)
2. Functional limitations (latent)
3. Depressive symptoms (latent)

Age, education, income, employment status
Alcohol Abuse Symptoms [$\alpha = .80$]

A Latent Variable with 6 Indicators:

Has drinking ever been a problem for you?

Do you ever feel the need to cut down on your drinking?

Does it make you mad when someone complains about your drinking?

Do you ever feel guilty about your drinking?

Do you ever take a morning eye-opener?

During the past year, has a Sepulveda VA doctor, nurse, or other healthcare person told you that you should drink less?
Mental Health Inventory (MHI)-5  \[ \alpha = .84 \]

A Latent Variable with 5 Indicators:

“How much of the time during the past 4 weeks…”

*Have you been a very nervous person?*

*Have you felt calm and peaceful?*  [Reverse-scored]

*Have you felt down-hearted and blue?*

*Were you a happy person?*  [Reverse-scored]

*Have you felt so down in the dumps that nothing could cheer you up?*

(6 response options, from “none of the time” to “all of the time.”)
Functional Status Questionnaire $[\alpha = .95]$ 

A Latent Variable with 13 Indicators:

*Degree of difficulty (none, some, much) with activities such as:*

- Walking one block, several blocks
- Climbing a flight of stairs
- Doing errands such as grocery shopping
- Driving a car or using public transportation
- Taking care of other people, such as family members
- Self-care (eating, dressing, bathing)
Post-Earthquake Dependent Variables

1. Depressive symptoms (latent)

2. “Quake impact” (latent)

3. “Quake hassles” (observed)
Quake Impact [$\alpha = .61$]

A Latent Variable with 5 Indicators:

**Indicator 1:**
How have “things changed for you” since the earthquake? (four response options from “not at all” to “very much”)

**Indicators 2-5:**
“As a result of the earthquake, did you have any of these problems…” (yes/no)

(2) Minor injuries; (3) Major injuries, (4) Pain, (5) Distress
Quake Hassles

An observed variable: Sum of number of post-earthquake difficulties, e.g. unable to get care, loss of home, difficulty refilling medications. (Yes/No response options.)

Examples:

“Because of the earthquake, were you without enough food to eat for a period of 24 hours or more?”

“Do you have any medical equipment that was broken or lost during the earthquake; for example, a wheelchair, a hearing aid, or eyeglasses?”
Data Analysis

• Descriptive statistics
  – Demographics
  – Symptoms of alcohol abuse

• Structural equation model (path model using latent variables)
Sample Characteristics

Average age, 61 years (Range, 22-90)

Race/ethnicity
- 7.3% African American/black
- 1.4% Asian
- 5.6% Latino
- 3.3% Native American
- 77.0% White
- 5.4% “Other”

100% male gender
Sample Characteristics

Education
- 13.2% Less than HS diploma
- 28.5% HS diploma
  - 4.2% Trade school (1-2 years)
- 32.2% Some college (1-3 years)
- 12.9% 4-year college diploma
  - 9.0% More than 4-year college diploma

Annual Income
- 62.5% < $15,000
- 28.0% $15,000 -- $29,999
  - 9.5% ≥ $30,000

28.7% Has a paying job
Alcohol Abuse Symptoms

Has drinking ever been a problem for you? 24.5%

Do you ever feel the need to cut down on your drinking? 20.8%

Do you ever feel guilty about your drinking? 10.3%

Do you ever take a morning eye-opener? 7.6%

Does it make you mad when someone complains about your drinking? 7.4%

During the past year, has a Sepulveda VA doctor, nurse, or other healthcare person told you that you should drink less? 14.0%
Rectangles are observed variables.

Circles are latent variables (factors with multiple indicators).

Double-headed arrows are correlations.

One-headed arrows are predictive paths from pre- to post-earthquake.

Model Fit Statistics:
   CFI = 0.96
   RMSEA = 0.027
Discussion

• Norris et al (2000) reported most studies of Northridge earthquake found little effect on mental health. However, these studies were conducted 6-14 months after quake, & were cross-sectional.

• This study is the first to show an independent association of pre-earthquake alcohol abuse symptoms & post-earthquake depressive symptoms.
Limitations

• None of the instruments were diagnostic

• Administered by telephone, may have missed Veterans with most earthquake-related harm

• May have limited generalizability (across time, & to non-Veterans)

• Sample did not include women (who are now 15% of Veteran population)
Implications & Future Work

Disaster planning for VA healthcare providers may target Veterans with symptoms of alcohol abuse, depression & functional limitations.

Replicate this work in other, non-Veteran populations.
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