Using AUDIT-C Alcohol Screening Data in VA Research: Interpretation, Strengths, Limitations, & Sources

Carol Achtmeyer MN, ARNP
Katharine Bradley MD, MPH

Northwest HSR&D Center of Excellence, VA Puget Sound Substance Use Disorders QUERI Center of Excellence in Substance Abuse Treatment & Education
Department of Medicine, University of Washington
Audience Q#1. Which of the following best describes you?

1. VA clinician-researcher
2. VA researcher (not a clinician)
3. VA - Other
4. Non-VA researcher
5. Non-VA other
Audience Q#2
What is your primary interest in this presentation?

1. Want to use AUDIT-C data as an exposure, outcome or covariate
2. Want to know how to access AUDIT-C or other mental health screening data
3. Other
Outline

1. Introduction to the AUDIT-C alcohol screening questionnaire
2. Interpretation of AUDIT-C scores
   - Reliability and validity in research settings
   - Association with health outcomes
3. Sources of AUDIT-C data for research in VA
   - Survey and clinical screening
   - Applying for access
4. Strengths and limitations of each
Introduction
Introduction to AUDIT-C

- **AUDIT consumption questionnaire (AUDIT-C):** the first three questions of the WHO’s 10-item alcohol screen called the Alcohol Use Disorders Identification Test (AUDIT) (Bush 1998)
- Performs as well as the 10-item AUDIT (Kriston 2008)
- Initially described as a screen for risky drinking or alcohol use disorders in male VA patients (Bush 1998)
- Validated in non-VA primary care settings and US general population (Bradley 2007, Frank 2008, Dawson 2005a & b)
- Used for alcohol screening in and outside US
AUDIT-C

1. **Frequency**: How often did you have a drink containing alcohol in the past year? (0-4 points)

2. **Quantity**: How many drinks did you have on a typical day when you were drinking in the past year? (0-4 points)

3. **Heavy Drinking Episodes**: How often did you have 6 or more drinks on one occasion in the past year? (0-4 points)

**Scoring**: Total AUDIT-C score 0-12;

(Bush1998; Bradley 2003; Bradley 2007; Frank 2008)
Spectrum of Alcohol Misuse

- Alcohol Dependence
- Problem Drinking
- Risky Drinkers
- Low-level Drinkers
Risky Drinking

Drinking more than…

- Men
  - 14 drinks a week
  - 4 drinks on an occasion

- Women
  - 7 drinks a week
  - 3 drinks on an occasion

NIAAA Clinician’s Guide 2007
Spectrum of Alcohol Misuse

DSM-IV
3 of 7 criteria past 12 months

Alcohol Dependence

Problem Drinking

Risky Drinkers

Low-level Drinkers

Men
> 2 dr/day average
> 4 drinks/occasion

Women
> 1 dr/day average
> 3 drinks/occasion
DSM-IV Alcohol Dependence

- Activities given up due to drinking
- Tolerance to alcohol
- Large time spent drinking
- Use despite problems due to drinking
- Withdrawal
- Persistent desire, inability to cut down
- Drinking larger/longer than intended

(APA 1994)
Spectrum of Alcohol Misuse

DSM-IV
3 of 7 criteria past 12 months

Alcohol Dependence
- Continued drinking despite adverse consequences

Problem Drinking
- Men: > 2 drinks/day average, > 4 drinks/occasion
- Women: > 1 drinks/day average, > 3 drinks/occasion

Risky Drinkers

Low-level Drinkers
Interpretation
Interpretation

- AUDIT-C scores range 0-12 points
- Nondrinkers: 0 points
- Drinkers, negative screen:
  - 1-3 points men
  - 1-2 points women
- Positive screen:
  - ≥4 points men
  - ≥ 3 points women
Interpretation – Individual Items

- **Test retest reliability at 3 months:** 0.85, 0.65, and 0.80, respectively for Q#1-3 among stable patients
- **Discriminative validity of items:** Questions #1-2 underestimate typical drinking when compared to detailed interviews about alcohol consumption:
  - Only 54% of male VA patients who drink over >14 drinks a week based on interviews reported doing so on AUDIT-C Q#1-2

*(Bradley 1998)*
Discriminative Validity

Sensitivity/Specificity for Identifying Alcohol Misuse Based on Detailed Interviews

| AUDIT-C Score | VA Outpatients | | | Non-VA Outpatients | | |
|--------------|----------------|----------------|----------------|----------------|----------------|
|               | Men | Women | Men | Women | |
| ≥2           | --- | 0.84 / 0.85 | 0.98 / 0.63 | 0.89 / 0.78 |
| ≥3           | 0.95 / 0.60 | **0.66 / 0.94** | 0.92 / 0.79 | **0.73 / 0.91** |
| ≥4           | **0.86 / 0.72** | 0.48 / 0.99 | **0.86 / 0.89** | 0.57 / 0.96 |
| ≥5           | 0.68 / 0.90 | --- | **0.72 / 0.96** | **0.36 / 0.98** |
| ≥6           | 0.53 / 0.94 | --- | **0.52 / 0.97** | **0.23 / 0.99** |
AUDIT-C and Alcohol-related Symptoms

Bradley ACER 2004
AUDIT-C Scores and Dependence

DSM-IV Alcohol Dependence, Past Year

Prevalence in Men %

A Rubinsky, Drug Alc Dependence, 2010
Anti-hypertensive Medication Adherence in Male VA Patients

AUDIT-C and Post-operative Complications*

![Graph showing prevalence of complications based on AUDIT-C scores in year prior to surgery.]

*Adjusted for age, smoking, & time from screen to surgery

Bradley JGIM 2010
AUDIT-C and Mortality

Risk of Death and AUDIT-C Score by Age Categories

(Kinder 2008)
## AUDIT-C’s Association with Health

<table>
<thead>
<tr>
<th>AUDIT-C Scores:</th>
<th>Health Outcomes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Nondrinkers have poorer health outcomes in many analyses</td>
</tr>
<tr>
<td>≥ 4</td>
<td>Decreased medication adherence</td>
</tr>
<tr>
<td>≥ 6</td>
<td>Increased hospitalizations: GI conditions</td>
</tr>
<tr>
<td></td>
<td>Increased risk of fractures</td>
</tr>
<tr>
<td>≥ 8</td>
<td>Poorer self-management Htn and DM</td>
</tr>
<tr>
<td></td>
<td>Increased hospitalizations with Ambulatory Care Sensitive Conditions (ACSC)</td>
</tr>
<tr>
<td>≥ 10</td>
<td>Increased mortality</td>
</tr>
</tbody>
</table>

(Bryson, 2008; Au 2007; Harris 2009; Chew, 2011; Kinder 2008)
Summary

- Depending on your use of the AUDIT-C, dichotomizing is not always a good idea
  - Nondrinkers often sicker
  - Low level drinkers often healthiest
  - And severity increases as AUDIT-C scores increase
Questions about Part 1-2?
Sources of AUDIT-C data in VA
Sources of AUDIT-C Data

Overview

1. Mailed surveys
   - Survey of Healthcare Experiences of Patients (SHEP)

2. Clinical screening
   - Electronic VistA data
     - Extracted from Local VistA, VISN Data Warehouse, and Corporate Data Warehouses (CDW)
   - Medical record reviews conducted for quality improvement
Mailed Surveys - SHEP

Survey of Healthcare Experiences of Patients (SHEP)

- VA Office of Quality and Performance (OQP’s) satisfaction survey
- Outpatient SHEP included AUDIT-C since FY04
- ~233,000 AUDIT-Cs per year FY04-08
- Included on ~10% of mailed surveys since the last 2 quarters of FY09 (“long form” of SHEP)
- Expect ~19,000 per year starting FY10
Clinical AUDIT-C Data
Clinical AUDIT-C Data

- Electronic data obtained from
  - VistA
  - CDW
- Medical record review data
Clinical AUDIT-C Data

- Generated using VA’s Electronic Medical Record: CPRS
- CPRS Decision Support Tool: Clinical Reminders
- Clinical Reminders Data for AUDIT-C
  - Health Factors – not standardized
  - Mental Health Assistant – is standardized
Clinical Data: Mental Health Assistant (MHA)

- The AUDIT-C in CPRS that is most commonly used is from the Mental Health Assistant (MHA)
- MHA
  - Includes ~ 30 mental health screens
  - Calculates the score for the clinician
  - Imports information to CPRS progress notes
- MHA data cannot be edited or changed by the site (nationally standardized)
Electronic (Clinical) Data History

- In January 2004, AUDIT-C screening adopted by VA
- Clinical Reminder (CR) AUDIT-C disseminated
  - Implementation of CR optional, but most sites used
- The CR prompted clinicians to assess whether a patient had used alcohol in the past year
- AUDIT-C 2004-2008: Only Drinkers Screened (MHA data)
- A “health factor” (data tag) indicated past-year non-drinkers
  - Health factors can be edited so there are variations in “nondrinker health factors” across sites
Example of Alcohol Use Screen
Clinical Reminder 2004-2008

- Health Factor generated

IN THE PAST 12 HRS, HAS PT HAD ANY DRINKS CONTAINING ALCOHOL?

- Yes, pt has consumed alcohol in past year
- No, pt has not consumed alcohol in past year
- Pt declined alcohol use screen at this encounter

ETOH = ALCOHOL YES
Example of Alcohol Use Screen
Clinical Reminder 2004-2008

The button on the right inside the oval accesses MHA-AUDIT-C
If patients indicated they drank alcohol in the past year, clinicians were prompted to administer AUDIT-C.

The AUDIT-C from the Mental Health Assistant (MHA) was used in the clinical reminder.

MHA scored the AUDIT-C and stored responses as a single string: “4,0,0” if 4 points Q#1 and 0 points Qs#2-3.
History of AUDIT-C Use in VA

2008-present

- In 2008 the MHA AUDIT-C changed
- All patients had to be asked Q#1 of the AUDIT-C
- MHA AUDIT-C included a skip out if patients answered “never” Q#1 about the frequency of drinking in the past year
- MHA data structure became more complex
  - AUDIT-C data in VistA are harder to identify
  - MHA data are not familiar to many researchers
  - Experienced programmers cannot find MHA data

(Hawkins 2007; Bradley 2007)
AUDIT-C Reminder after 2008

A standardized tool to screen for hazardous or problem drinking should be administered to all patients. The AUDIT-C is a sensitive tool for identifying those patients who may be at risk of problems due to drinking. The risk of being alcohol dependent and experiencing problems due to drinking increases as AUDIT-C scores increase.

AUDIT-C screening questions should be asked verbatim, in a nonjudgmental manner.

Perform AUDIT-C

Unable to Screen

Due to Acute Illness

Due to Chronic, Severe Cognitive Impairment

Refused alcohol screening

AUDIT-C Questionnaire

Clear | Clinical Maint | Visit Info | < Back

Alcohol Use Screen:

*Indicates a Required Field

1. How often did you have a drink containing alcohol in the past year?
   - Never
   - 2. Monthly or less
   - 3. Two to four times a month
   - 4. Two to three times per week
   - 5. Four or more times a week

2. How many drinks containing alcohol did you have on a typical day when you were drinking in the past year?
   - 1. 0 drinks
   - 2. 1 or 2
   - 3. 3 or 4
   - 4. 5 or 6
   - 5. 7 to 9
   - 6. 10 or more

3. How often did you have six or more drinks on one occasion in the past year?
   - 1. Never
   - 2. Less than monthly
   - 3. Monthly
   - 4. Weekly
   - 5. Daily or almost daily
Electronic AUDIT-C Data – Summary

From about 1/2004 to 1/2008

- Local health factor(s) identify nondrinkers (varies across sites)
- AUDIT-C 3-item response string (100), date
- MHA AUDIT-C data typically represented only patients who drank alcohol

After 1/2008

- Most sites used new MHA AUDIT-C that skipped Q#2-3 if patients responded “never” to Q#1
- AUDIT-C questions – questions/responses/score stored in complex relational data files
Electronic AUDIT-C Data

How AUDIT-C MHA Data Can be Obtained

1. Local VistA system
   - Fileman query:
     - File 601.2 (before 2008)
     - Multiple files in the 601 series after 2008
   - New MHA “XML” extract tool

2. VISN Data Warehouses
   - Obtain approval from local authorities
Electronic AUDIT-C Data

How AUDIT-C MHA Data Can be Obtained

3. Corporate Data Warehouse (CDW) and Regional Data Warehouses
   - National MHA data available in the next 1-2 years
   - Obtain approvals from National Data Systems
Medical Record Reviews (EPRP)

- Many sites began using AUDIT-C in 2004
- Since 2006 AUDIT-C was the **required** screen
- EPRP has used medical record reviews to monitor screening since 2004 and follow-up since 2006
- Sample of VA patients who have outpatient visit
  - ~31,000 AUDIT-C screens per quarter
  - ~15,000 from “NEXUS” cohort
Strengths and Limitations of AUDIT-C Data from Different Sources
Strengths and Limitations

- SHEP
- Concerns about quality for clinical AUDIT-C data in general
- Specific types of clinical AUDIT-C data
  - Electronic – VistA
  - Electronic CDW
  - EPRP
Strengths and Limitations: SHEP

- AUDIT-C administered in a standard fashion
  - Improves quality of screening
- Response bias – lower response rates in:
  - Younger patients
  - Women

(Wright 2006)
Concerns about Quality of Clinical AUDIT-Cs

- Clinical and survey screening compared
- > 6000 patients completed the AUDIT-C on SHEEP surveys within 90 days EPRP reviews
- Discordance was common, especially among patients with positive screens on SHEEP
- 61% of patients who screened positive on SHEEP surveys screened negative clinically
- Variation across race and VISN
- Both electronic (MHA) and EPRP data affected

(Bradley 2011)
Strengths and Limitations: CDW

Electronic AUDIT-C Data

- Change in data structure in 2008
  - Before 2008
    - Health factors to identify non-drinkers
    - A single string of the three AUDIT-C item responses
  - After 2008: data complex
Strengths and Limitations: VistA

Electronic AUDIT-C Data

- VistA
  - Can be extracted locally (Fileman or XML)
  - Complex query however requires multiple file jumps
- CDW
  - No national data currently available
  - Data before 2008: only Region 1 currently
  - Experienced data analysts to pull from CDW
  - Substance use disorders QUERI will disseminate data dictionary
Strengths and Limitations: EPRP

EPRP Medical Record Reviews

- Limitations
  - Small numbers positive screens per facility/network (Bradley 2006)
  - Reliability of abstraction

- Strength
  - Represents data available to clinicians
  - Includes medical record review data on follow-up as well: advice, feedback, discussion of referral, referral, and completion of referral
Conclusion

- AUDIT-C is a clinical alcohol screen that can be used as a dichotomous or categorical measure
- Widely validated in research settings
- Increasing scores reflect increasing severity
- Two types of AUDIT-C data available:
  - Survey data: more standardized and administered as validated, but limited by response bias for studying some populations (e.g. younger patients)
  - From clinical screening—electronic data or from medical record reviews—have variable quality
Thank You!

Questions?

carol.achtmeyer@va.gov
katharine.brady@va.gov
References


References


