

## Correlations between Outcome Scores

### “Firefighter Hearing Health”

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- Participants from fire departments in CA, IL, & IN
- Omaha System Partnership for Knowledge Discovery and Health Care Quality

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## Introduction

- Noise-induced Hearing Loss (NIHL):  
One of most prevalent occupational injuries among firefighters in the U.S.
- Need in measurement of outcomes of hearing loss prevention programs
- “Omaha System Problem Rating Scale for Outcomes”:  
Standardized language represent health outcomes relative to hearing problem

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**Modeling Relationships**

- It is difficult to understand relationships between educational interventions, behavior changes, and health outcomes.
- Omaha System Knowledge, Behavior and Status framework enables investigation of associations between hearing health outcomes




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**Purpose**

- “Correlations” between standardized hearing health variables

: KBS variables by definitions of Omaha System rating




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**Method**

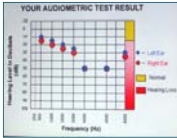
- Secondary analysis from 

*Internet-based survey*



**Knowledge**

*Hearing assessment*



**Behavior**

**Status**

(\*) S.I.R.E.N. (Safety Instruction to Reduce Exposure to Noise and Hearing Loss)

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## Participants

- **346 firefighters from CA, IL, and IN**

Characteristics	Mean
Age (Years)	45
Years of work in fire service	17
Characteristics	%
Ethnicity (Caucasian or White)	81
Gender (Male)	94
Loud noise exposure at job site (daily/weekly)	84

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Standardized Outcomes	Omaha System Rating	SIREN Data	Mean
<b><u>KNOWLEDGE</u></b>	<b>Ability of the client to remember &amp; interpret information</b> 1=no knowledge 5=superior knowledge	Four questionnaire items on Noise-induced hearing loss and its prevention 1=no correct answers 5=4 correct answers	<b>3.7</b>
<b><u>BEHAVIOR</u></b>	<b>Observable responses, actions, or activities of the client fitting the occasion or purpose</b> 1=not appropriate behavior 5=consistently appropriate behavior	% of time of Use of hearing protection device(HPD) 1= 0 to 20% 5=81 to 100%	<b>2.2</b>
<b><u>STATUS</u></b>	<b>Condition of the client in relation to objective and subjective defining characteristics</b> 1= extreme signs/symptoms 5=no signs/symptoms	Objective hearing status 1=above 80dB 5=less than 25dB	<b>4.4</b>

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## Data Analysis

- **SPSS 18.0**
- **Descriptive statistics**
- **Nonparametric analysis**
  - "KBS" variables are categorical variables with skewed distributions
  - Spearman's rho correlations

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UCSF  
University of California  
San Francisco

### Correlations between "KBS"

The level of statistical significance:  $p < .05$

SCALE	Knowledge	Behavior	Status
Knowledge	1	-	-
Behavior	0.13 ( $p=0.01$ )	1	-
Status	-0.07 ( $p=0.19$ )	0.12 ( $p=0.02$ )	1

→ Significant correlation: knowledge-Behavior & Behavior-Status

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- ### Conclusion
- Firefighters having higher-level knowledge on NIHL used HPDs more frequently.
  - Firefighters frequently used HPDs showed better hearing status.
  - Future studies
    - Comparison between the baseline and the current hearing assessments of firefighters
    - Compare between the "KBS" scores to other populations of interest for the hearing problem
- (\*) NIHL: Noise-induced hearing loss, HPD: hearing protection device

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- ### Implications
- Standardizing health data will create opportunities
    - further analysis of the way in which knowledge-behavior-status changes occur.
    - enable data exchange across occupational health and other care settings.
  - Data exchange will support population-based hearing health assessments and outcomes.

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