

Safety Voice for Ergonomics (SAVE): Evaluation of Text Message Refresher Training Outcomes

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Background

- Brick masons suffer from high rates of musculoskeletal injuries.
- Overexertion injury prevalence among brick masons exceeds general construction and all other private and public industries. Brick masons currently rank second in the United States for rates of occupational back injuries.
- The brick masonry industry is projected to grow by 40 percent through the year 2020.



Brick Masons are at high risk of musculoskeletal injury due to risk factors such as heavy lifting, awkward postures, repetitive motion, and prolonged postures.

SAVE Intervention

The Safety Voice for Ergonomics (SAVE) intervention is a three-arm, randomized-controlled study utilizing health and safety training strategies to teach brick masonry apprentices:

- Ergonomics (ERG)
- Ergonomics and Safety Voice (ESV)
- Nothing additional (Control)

Ergonomics training included: risk factors and solutions
Safety Voice training included: problem solving and communication

Text messages were sent to apprentices following the completion of a classroom training session that were designed to reinforce the in-person training and evaluate retention of training materials.

Study Population

73 brick masonry apprentices were recruited from six training centers across the US: three were given the ergonomics-only intervention and three were given the combined ergonomics and safety voice intervention.

- Apprenticeship programs are four years in duration with the mean apprenticeship year being 1.4.
- Age of apprentices ranged from 18 to 46 years with a mean age of 26 years.

Age	18-20	21-25	26-30	31-35	36-40	41+
Ergonomics & Safety Voice (percent)	40.5	13.5	16.2	16.2	8.1	5.4
Ergonomics (percent)	19.4	33.3	30.6	8.3	0	8.3

Apprenticeship year	1	2	3	4
Ergonomics & Safety Voice (percent)	59.5	32.4	2.7	5.3
Ergonomics (percent)	75	16.7	5.5	2.8

Figure 1. Age and Apprenticeship Year Distribution by Intervention Group: Ergonomics & Safety Voice (n=37) and Ergonomics (n=36)

Methods

Standard refresher text messages were sent using an automated distribution software (slicktext.com) that allows for messages to be sent at pre-determined intervals.

- This evaluation analyzed data over one month
- Apprentices in Ergonomics received a total of 14 texts with 5 requiring a response.
- Apprentices in Ergonomics & Safety Voice received a total of 22 texts with 9 requiring a response.
- Messages requiring a response were designed to evaluate knowledge retention and behavior change in the form of a yes/no or true/false response.
- Correct responses for questions measuring behavior change required the apprentice to demonstrate individual use of ergonomic solutions, while correct responses for knowledge retention required apprentices to demonstrate retention of the training intervention materials.

Outcome measures were calculated using:

- Correct Response Rate**
= # of correct responses / # of responses received
- Apprentice Response Rate**
= # of responses received / # of messages requiring response

Results

Analyzed apprentice response rates and correct response rates by intervention group showed that:

- Apprentices receiving the combined ergonomics and safety voice training had a response rate of 59.8 percent and demonstrated a correct response rate of 83.8 percent.
- Apprentices receiving only the ergonomics training had a response rate of 66.7 percent and demonstrated a correct response rate of 77.1 percent.

Data collected across all intervention groups showed that over one month:

- The apprentice response rate was 62.2 percent.
- The correct response rate was 81.3 percent demonstrating strong retention of training materials.

	ESV1 (n=9)	ESV2 (n=8)	ESV3 (n=20)	ERG1 (n=14)	ERG2 (n=12)	ERG3 (n=10)	Totals (n=73)
Messages Sent Requiring Response	81	72	178	68	60	49	508
Total Number of Responses	69	56	73	51	44	23	316
Total number of Correct Responses	58	44	64	41	32	18	257
Apprentice Response Rate (percent)	85.2	77.8	41.0	75.0	73.3	46.9	62.2
Correct Response Rate (percent)	84.0	78.6	87.7	80.4	72.7	78.3	81.3

Figure 2. Raw Text-Messaging Data by Training Center

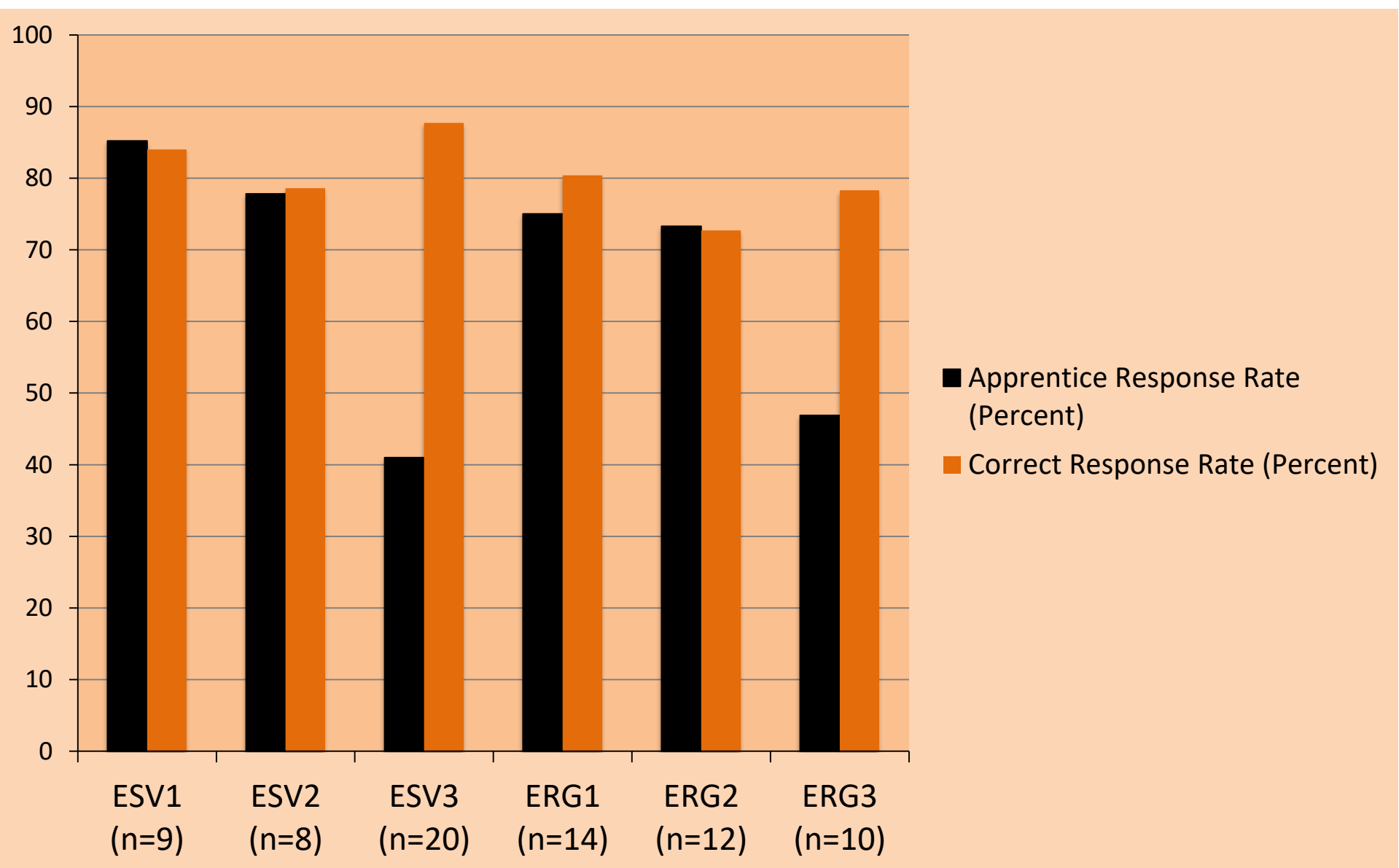


Figure 3. Apprentice Response Rate and Correct Response Rate by Training Center

	Ergonomics and Safety Voice (n=37)	Ergonomics (n=36)	Total (n=73)
Apprentice Response Rate (Percent)	59.8	66.7	62.2
Correct Response Rate (Percent)	83.3	77.1	81.3

Figure 4. Summary Apprentice Response Rate and Correct Response Rate by Intervention Group

Discussion

Correct response rates exceeded 70 percent for all training centers, while overall apprentice response rates ranged from a low of 41.0 percent to a high of 85.2 percent.

The lower response rate may be attributed to several factors including:

- Limitations or restrictions related to personal cell phone usage and service
- Lack of desire to use text messaging as an refresher training platform
- Lack of perceived need to complete the text messaging refresher training as it was not incentivized or enforced

When apprentices did respond they were mostly correct which demonstrates learning retention.

Conclusion

Text messaging has potential for maintaining occupational safety and health learning outcomes, however further investigation is needed to determine barriers to participation among construction apprentices.

