

Grant AFC719-34: Identifying and Assessing Risks Factors Associated with Musculoskeletal Disorders within Stone and Sand and Gravel Mining Operations

Organization and Principal Investigator: Indiana University (Todd Smith)

Focus Area: Injury & Disease Exposure & Risk Factor

Priority Area: Identification of Mining Jobs and Operations with High Rates of Work-related Musculoskeletal Disorders (WMSD), including the Evaluation of the Effectiveness of Measures Intended to Reduce or Prevent These Disorders

Problem Statement and Research Approach: Musculoskeletal disorders, particularly strains and sprains, within stone and sand and gravel mining operations are problematic. In order to protect the nearly 102,000 miners working in this field, exploratory research needs to be conducted to further identify factors that place these miners at risk for musculoskeletal disorders. The industry, stakeholders and researchers know it is a problem, but a knowledge gap exists as specific factors that place miners at risk for these disorders are not known or understood. Further, we do not fully understand the relationships between various protective factors, particularly safety resources, and musculoskeletal disorders.

We believe that research exploring the impact of demographic and personal factors, work characteristic and job demands and safety resources on musculoskeletal disorder outcomes is necessary. Our proposed research specifically addresses a national problem and seeks to benefit the stone and sand and gravel mining industry by providing guidance on demands that need to be countered or controlled to prevent MSDs and by identifying safety resources, which will counter exposures present for all stone and sand and gravel miners. We believe these resources will serve as a means to enhance miner safety, health and wellbeing and will provide guidance for research-to-practice (R2P) initiatives.

Specific Aims:

- Verify and refine a model incorporating demographics, personal factors, work characteristics, job demands and safety resources, which is applicable to stone and sand and gravel mining operations. As part of this process, job demands associated with musculoskeletal disorders and safety resources that will counter demands will be identified.
- Formalize a survey instrument based upon preliminary qualitative work and subject matter expert review.
- Test the finalized model and hypothesized relationships related to model factors and musculoskeletal symptoms and disorders.
- Disseminate the results of this study through scholarly means and through other resources to enhance stone and sand and gravel mine worker safety, health and wellness and to bolster research-to-practice (R2P) initiatives, particularly identifying which resources can be enacted to curtail musculoskeletal disorders and to protect miners.