

AUTO BODY PAINT WORKERS: AN ASSESSMENT OF RESPIRATORS AND LEVELS OF FATIGUE

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**Dr. Atav and Mr. Bach have no
relationships to disclose**

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Fatigue

- ▣ Fatigue is the state of weariness or exhaustion resulting from insufficient sleep, prolonged work, or extended periods of stress or anxiety.
- ▣ Fatigue can be categorized as an acute, chronic and persistent state of tiredness that leads to mental or physical exhaustion.
- ▣ Long term effects of fatigue on health prevent people from functioning within normal boundaries creating obvious implications for workplace and public safety.

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Causes of Fatigue

- ▣ Work-related factors
 - Long work hours
 - Poor scheduling
 - Night shift work
 - Insufficient recovery time
 - Excessive stress
 - Long periods of time awake
 - Harsh work environment
 - Mentally or physically demanding activity
 - Inadequate rest breaks
- ▣ Factors outside of work
 - Sleep deprivation
 - Excessive social life
 - Family responsibilities
 - Other employment
 - Long travel time
 - Sleep disorders
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Effects of Fatigue

- ▣ Reduces ability to:
 - Concentrate
 - Make decisions
 - Communicate effectively
 - Recognize risks
 - Perform efficiently
 - Control emotions, handle stress
 - Remember and recall events and their sequences
 - Coordinate hand-eye movements
- ▣ Increases likelihood of:
 - Errors
 - Slow reaction times
 - Accidents
 - Long-term negative health effects such as:
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Prevention of Fatigue in the Workplace Leads to

- ▣ Better health and safety outcomes
- ▣ Fewer workplace incidents and injuries
- ▣ Reductions in absenteeism and staff turnover
- ▣ Better performance and productivity

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Purpose

- ▣ The purpose of this study is to examine work and outside work factors that contribute to fatigue among auto body paint workers in Northeastern Pennsylvania with a focus on respirator type and use.
- ▣ To that end, 60 workers were surveyed in 7 small auto body paint shops as a pilot study towards doctoral research

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Auto Body Shop Workers

- ▣ There are more than 35,500 auto body shops in the United States.
- ▣ With more than 170,000 spray paint technicians
 - Projected to increase by 32,000 between 2010-2020
- ▣ These technicians are routinely exposed to paint and solvents.
- ▣ Shop policies are guided by:
 - OSHA (
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 - NIOSH (
 - making recommendations for the prevention of work-related injury and illness

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Auto Body Paint Workers: Decreasing Chemical Exposure

- ▣ Structural Environment
 - Spray booth type – Best ones cost over \$80K
 - Spray gun selection - High volume low pressure
 - Type of Paint – Waterborne is better, but polyurethane is still standard
- ▣ Personal Protective Equipment (PPE)
 - Gloves, spray suits, head sock
 - Respirators
 - Correct type of PPE are expensive and many shops do not offer them

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Respirators

Negative Pressure Masks

- Basic use, least expensive
- Good protection at a reasonable cost (\$26)



Positive Pressure Masks

- Excellent protection, self-contained, expensive (\$900), heavy
- Excellent protection, expensive, utilizes external air source, cumbersome airline



Type of respirator used may be associated with levels of fatigue

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Survey Instruments

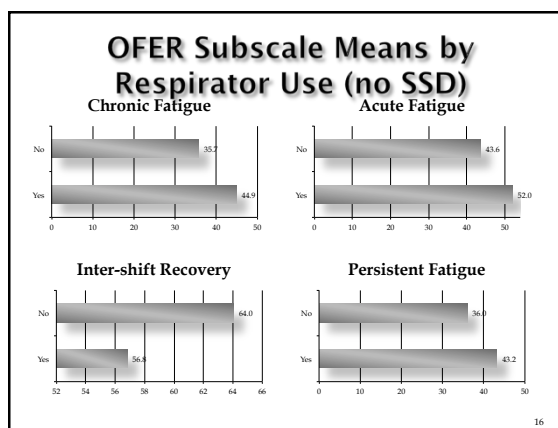
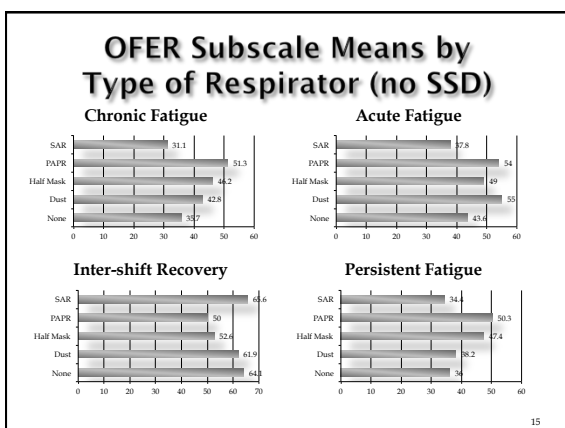
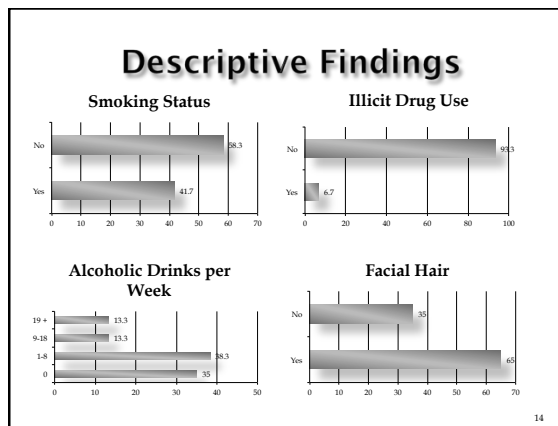
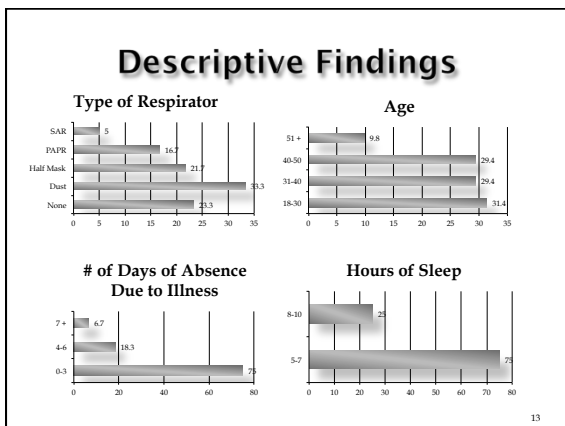
- ▣ Winwood's Occupational Fatigue Exhaustion Recovery State Scale (OFER)
 - It consists of 15 items, and responses are given using a 7-pt scale ranging from strongly agree to strongly disagree based on experiences of fatigue and strain at work and home over the past few months
 - Four Subscales
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OFER

- ▣ The OFER scale is unique in that it has been tested extensively on healthcare workers, specifically nurses, and has been demonstrated to have high internal and test-retest reliability, and free of gender bias
- ▣ It can distinguish between acute and chronic fatigue states and measure the recovery from fatigue between work shifts
- ▣ Other tested responses within the study include:
 - Type of respirator
 - Demographics
 - Illnesses/ absences and sleep measures
 - Illicit drug, and alcohol consumption
 - Tobacco use and facial hair

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- ### Additional Analyses
- ❑ No significant differences were found in four subscales of OFER regarding
 - Sleep
 - Drug, tobacco, and alcohol use
 - Days of absence from work because of illness
 - Age
 - Facial Hair
 - ❑ Further multivariate analyses revealed:
 - For those who sleep less, those using SARs had significantly lower acute fatigue than those who wore dust masks
 - For those who did not have facial hair, those using half masks had significantly lower chronic fatigue than dust or PAPR.
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- ### Limitations
- ❑ This pilot study included a small sample of 60 workers from a particular geographic area limiting the generalizability of the findings.
 - ❑ All data were self-reported.
 - ❑ Even though the confidentiality of the responses was guaranteed, some of the more sensitive data may not have been accurately reported.
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Conclusion

- ❑ This pilot study examined factors that might contribute to fatigue in a sample of auto body paint workers focusing on respirator use and type.
- ❑ Initial bivariate findings indicate that respirator type or use are not associated with levels of fatigue among this group of workers.
- ❑ Additional multivariate analyses reveal significant differences in fatigue levels.
- ❑ These findings clearly support the need for further study of respirators and fatigue in this much neglected group of workers.

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QUESTIONS?

THANK YOU!

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