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.

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
    - Insomnia
    - Sleep apnea
    - Restless leg syndrome

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:
    - ""
    - ""
    - ""

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
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.

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 (Occupational Safety and Health Administration)
    - Which sets and enforces standards
    - And provides training, outreach, educational assistance
  - NIOSH (National Institute for Occupational Safety and Health)
    - US Federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness

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

Respirators

- **Negative Pressure Masks**
  - Basic use, least expensive
  - Good protection at a reasonable cost ($25)
- **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

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
    - Chronic Fatigue
    - Acute Fatigue
    - Inter Shift Recovery
    - Persistent Fatigue

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
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.

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.
Conclusion

a. This pilot study examined factors that might contribute to fatigue in a sample of auto body paint workers focusing on respirator use and type.

b. Initial bivariate findings indicate that respirator type or use are not associated with levels of fatigue among this group of workers.

c. Additional multivariate analyses reveal significant differences in fatigue levels.

d. These findings clearly support the need for further study of respirators and fatigue in this much neglected group of workers.

References


