Fatigue and Engagement: The Impact of Shift Work Schedules

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Objectives

• Define the role shift work has in creating sleep debt resulting in worker fatigue

• Describe the impact fatigue has on nurse engagement at work

• Identify scheduling practices that diminish the likelihood of fatigue
Shift Work...

• Work schedules that vary by:
  – Time of day
    • Permanent work shift (day, evening, night)
    • Rotation forward or backward (morning to night, night to morning)
  – Days of week
    • May be driven by fixed patterns
    • May be inconsistent variable distribution pattern of the shifts
    • Often include weekend shifts
  – On-Call Coverage

Chung, Wolf and Shapiro (2009)
Shift Work in the Healthcare Industry...

• Nurses are often shift workers, irregular hours and around-the-clock.
• Variety of shift-lengths, day-of-week combinations and the rotation of time-of-day shifts  (Natvik et al., 2011)
• 75% of nurses today work 12 hour shifts  (Townsend & Anderson, 2013)
• Longer shift lengths result in
  - Shorter work weeks
    • Increase opportunities to work overtime hours
    • Increase opportunities to work second jobs
  (Marucci-Wellman, Lin, Willetts, Brennan & Verma, 2014)
Shift Work and Scheduling
Scheduling approaches...

- Fixed Schedules
  - Patterns

- Variable Schedules
  - Manually created
  - Automated generation (rules-based software) with manual intervention
  - Self-Scheduling
Common Fixed Schedule Patterns in Healthcare

- Metropolitan and Continental plans for 8 hour shifts

- Dupont, Pittman and Panama plans for 12 hour shifts
Variable Scheduling…

• Manually created
• Automated generation with manual intervention
• Self-Scheduling
  – Benefits
    • Empowering nurses
    • Supports work/life balance
    • Decreases administrative burden on managers
    • Enhances communication
    • Creates a cooperative community
Risks Associated with Variable Scheduling...

- Risks
  - Human error
  - Fairness
  - Poor attention to work/life balance
  - Lack of defined rules to drive automation of a “good” schedule
  - Lack of defined rules & processes to drive self-scheduling

There is a price to pay when work schedules are poorly constructed!
Impact of a poorly constructed work schedule
The Impact of Shift Work Schedules...

- Root cause of tiredness or fatigue in a qualitative study of nurses
  (Happell et al. 2013)

- Disrupts sleep patterns
  - most frequently reported health problem among shift workers
  (Natvik et al., 2011)

- Creates a conflict with circadian rhythms
  - interferes with the ability to obtain restorative sleep between shifts
  - results in accumulating “sleep debt”
  (Geiger-Brown et al, 2012)
The Impact of Shift Work Schedules…

• Consecutive shifts, regardless of time of day, incur significant sleep debt (Geiger-Brown et al, 2012)

• Inherent inability to maintain consistency can lead to “chronic” sleep debt (Witkoski & Dickson, 2010)
Sleep and Sleep Debt...

- Sleep-debt or lack of sleep adversely impacts performance
  (The National Sleep Foundation, 2014)

- Older workers doing shift work are prone to sleep disorders
  (Letvak, 2005)

- Every minute of “commute” time equals 0.84 minutes of sleep loss
  (Hirsch-Allen et al., 2014)
“Shift Work Sleep Disorder” (SWSD)

• International Classification of Diseases v10
  – G47.26 Circadian Rhythm Sleep Disorder, Shift Work Type
    • a normal pattern of sleep and wake cycles that conflict with shift work
      (ICD10Data.com, 2014)

• Most at risk:
  – Permanent night shift schedules
  – Any schedule with a night shift rotation

• Study of over 5,000 nurses found 37.6% fulfilled criteria for a diagnosis of SWSD
  (Flo et al., 2012)
Let’s look at some data…
Quantify the Probability of Fatigue...

- Tool: “Fatigue Index Score Calculator: Health & Safety Executive”
What did the data reveal?

- **Source Data:**
  - 379 shifts (12 hour) over a 4 week period

- **Probability of Fatigue:**
  - **Day Shift**
    - Highest score was 20.7% on the 4\textsuperscript{th} consecutive 12 hour shift
  - **Night Shift**
    - Lowest score was 42.3% on the 1\textsuperscript{st} shift after 2 days off
    - Highest score was 59.8% on the 5\textsuperscript{th} consecutive 12 hour shift
Shift Work Based Fatigue Leads to Burnout!

• Shift work and sleep disturbance are both antecedents to stress

  (Fountouki, Ourania, and Theofanidis, 2011)

• In nurses, the fatigue that results from stress is frequently referred to as burnout according to the seminal work of Duquette, Kerowc, Sandu and Beaudet (1994).
...and let’s not forget the patient!
Fatigue’s Impact on Care Delivery…

• The most alarming negative impact (of sleep debt, fatigue) is that of decrements in performance and decision regret.

  (Geiger-Brown & Trinkoff, 2010)

• A study of 546 registered nurses in the U.S. found that 30% reported decision regret.
  – Those reporting decision regret also reported increased amounts of fatigue.

  (Scott, Arslanian-Engoren & Engoren, 2014)
Fatigue’s Impact on Care Delivery…

- Work schedules have been associated with patient mortality
  - Pneumonia related deaths were significantly higher when nurses reported:
    - long work hours
    - decreased amounts of time away from work
  (Trinkoff et al., 2011)

- Fatigue associated with overtime work was associated with increased re-admission rates
  (Bobay, Yakusheva & Weiss, 2011)
Polar Opposites…

Engagement
- Energy
- Involvement
- Sense of Competence

Fatigue/Burnout
- Exhaustion
- Depersonalization
- Reduced Personal Accomplishment
Work Schedule Induced Fatigue

- Adversely impacts engagement in three ways:
  - Withdrawal behaviors (Exhaustion)
  - Feeling of being taken for granted, unimportant, needs are of less significance, a sense of being “apart from” (Depersonalization)
  - Decreased self-confidence, questions competence, fear of errors (Reduced Personal Accomplishment)
Resulting Behaviors…

• Absenteeism
  – Relationship between shift work and absenteeism (Bockermann & Laukkanen, 2010)
  – Physical fatigue was associated with absenteeism (Roelen et al., 2013)

• Turnover
  – Fatigue and exhaustion were among the top reasons for leaving an employer (Mackusick & Minick, 2010).

• Performance Decrement
  – Diminished attention to detail
  – Error prone
Diminishing Work Schedule Induced Fatigue
Recommendations…

• Clearly articulated rules!
• Consecutive 12 hour day shifts should not exceed four
• Consecutive 12 hour night shifts should not exceed three
• Create a culture of openness and encourage reporting excessive fatigue
• Night shift nurses should be closely monitored for signs of fatigue
• Commute time matters
• Know if your employees have a second job
• Know if your employees are working overtime in other departments/units
Learn Today, Improve Tomorrow

• Shift work schedule creation is where quality caregiving begins.
• Recognize the three behaviors associated with disengagement
  – Exhaustion exhibited by withdrawal
  – Depersonalization exhibited by a “sense of being apart”
  – Reduction in feeling of personal accomplishment
• Re-evaluate your schedule creation approach and practices
  – Ensure there are clear guidelines for shift lengths
  – Ensure there are clear guidelines for number of consecutive shifts
  – Nurses on permanent night shift and those rotating to nights should be carefully monitored for fatigue
Questions?
References


Witkoski, A. & Dickson, V. (2010). Hospital staff nurses work hours, meal periods and rest breaks. *AAOHN, 58*(11), 489-497.