CRE-MSD
Centre of Research Expertise for the Prevention of Musculoskeletal Disorders

GLOBAL ERGONOMICS MONTH WEBINAR SERIES

Supporting remote office work, pivoting back to the workplace during a pandemic, and the future of virtual workspaces

Work From Home and Beyond: A Holistic Approach to Addressing Technology, Ergonomic, and Organizational Factors

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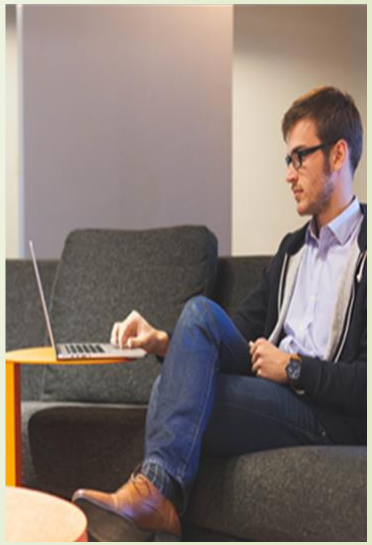
OERC, NU, COEH-UCB, CPH-NEW, UCONN

Presented by CRE-MSD in partnership with IHSA.ca Work Safe for Life | Public Services Health & Safety Association | PSHSA.ca | Workplace Safety & Prevention Services | Occupational Health Clinics for Ontario Workers Inc. | Centres de santé des travailleurs (ses) de l'Ontario Inc.

Agenda

- Telework; Virtual Office; Hybrid
- Challenges
- Work Systems Perspective
  - Job; Individual; Group; Organization
- Virtual Office intervention study
- Practical Implications and Programmatic Recommendations



Background: Telework/Remote Work

- Telework: Not a new concept---working from home full-time or partial; alternative work arrangements
- Research identifies several challenges and benefits of telework
- Insufficient research: positive or negative effects for employees?
  - well-being, safety and performance effects?
- How to manage telework—distance managing?
- How best to address the Safety/Health and Ergonomic factors?
- Use these findings to adopt and create new, flexible ways of working at home
- Provide managers guidance on the Human Factors/Ergonomics & Occupational Safety & Health Issues to build sustainable programs

Successful telework program elements (1990-2020)

- Plan & evaluate program
- Identify appropriate population
  - Work; Preferences; Skills
- Define level of formalized policies
- Secure commitment from senior managers
- Address legal issues
- Consider Human Resources:
  - Employee selection & career development;
  - Training, communication and role expectations
  - Teams; Norms & shared experiences
  - Address inclusion/belonging/fairness
- Maintain infrastructure & support of Information Technology
- ***Telework isn't for everyone—until COVID-19***

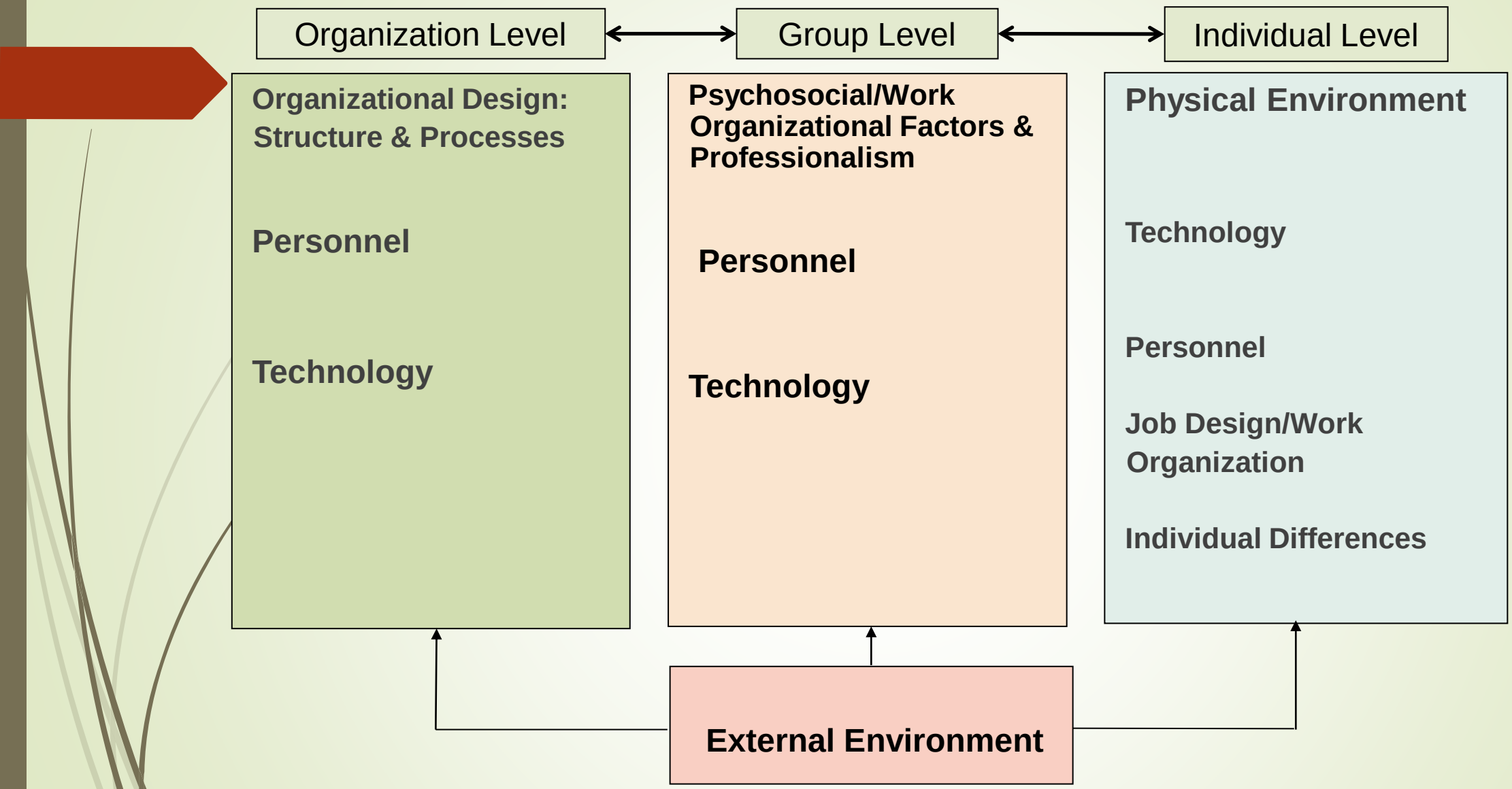
Challenges

Lack of social interaction	Changes in job autonomy	Distance Management	Absence of mentoring
Collaborative/ teamwork	Extended work hours	Increased Workload	Work Environment
Work/Life Balance	Healthy Work/Computing	Technologies Digital age	Internet Security

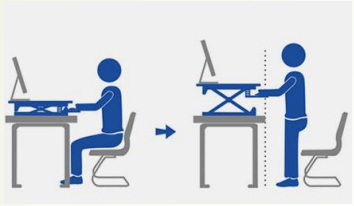
A Holistic Perspective: “The Big Picture”

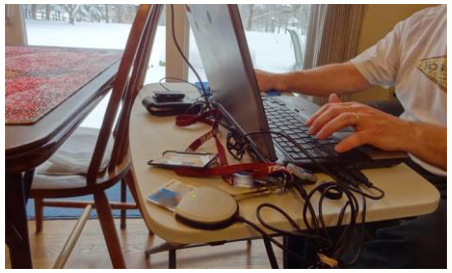
External Environment

COVID-19



Organization Level ⟷ Group Level ⟷ Individual Level





Individual Differences

Physical Environment
- Workstation/Workspace design

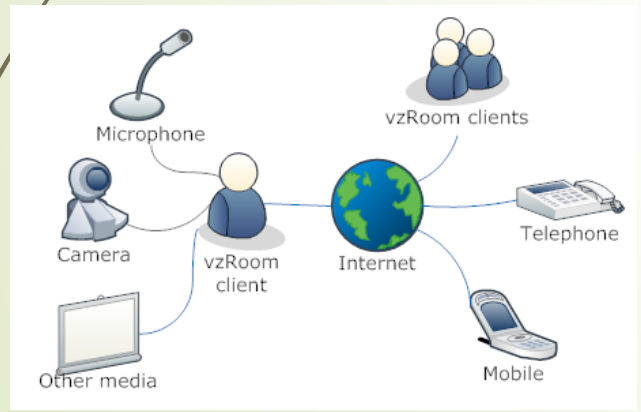
Technology
- Software Design
- Usability

Personnel
- Training & Performance Aids

Psychosocial & Work Organizational Factors
- Balanced work/personal
- Job Demands (24/7)
- Telepresence
- Decision making (workstyle)
- Job control
- Work/Life Balance
- Career development
- Social isolation

Effectiveness Outcomes
- Performance
- Workplace comfort
- Workplace design satisfaction
- Job satisfaction
- Quality of work-life
- Wellness and Health

Organization Level ⟷ Group Level ⟷ Individual Level



Psychosocial/Work Organizational Factors & Professionalism

- Teamwork synergy
- Job design for teams
- Co-worker support & interaction
- Managerial support (facilitator/communicator)
- Work/Performance Contract
- Cultural/social norms

Technology

- Groupware & social media
- Video/tele-conferencing

Effectiveness Outcomes

- Group collaboration; effectiveness
- Teamwork performance

Organization Level ⟷ Group Level ⟷ Individual Level

Organizational Design: Structure & Processes

- Operating Policies/Practices
- Human resources
- Senior management support
- Financial resources

Personnel & Training

- Information systems training
- Job performance training
- Safety/ergonomic training

Technology

- Information systems
- Technical on-line support

Effectiveness Outcomes

- Customer satisfaction
- Employee satisfaction
- Turnover, absenteeism
- Balanced score card
- Economic Value Added
- Operational Excellence

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External Environment

- Global economy
- World politics
- International Culture & values
- Market/customer demands

Physical Environment

- Workstation/Workspace design

Technological

- Software Design
- Usability

Personnel

- Training & Performance Aids

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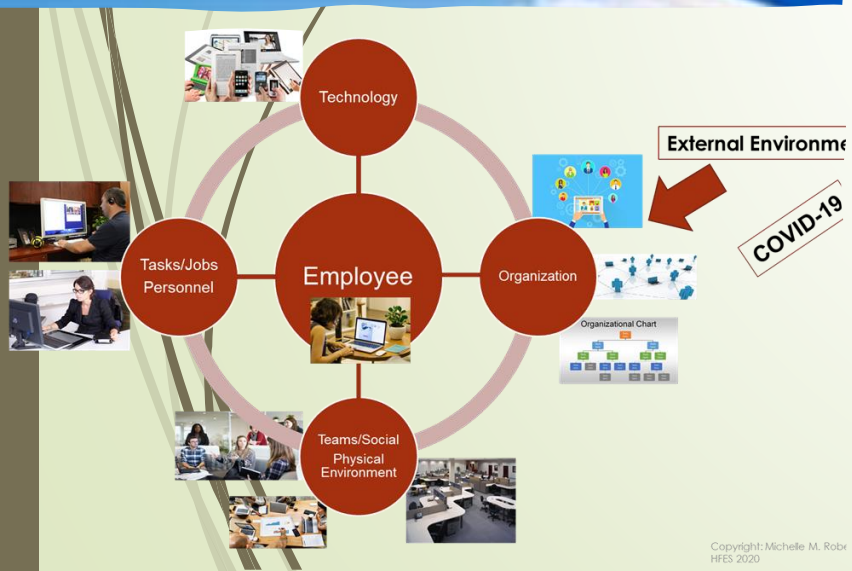


Research Gap

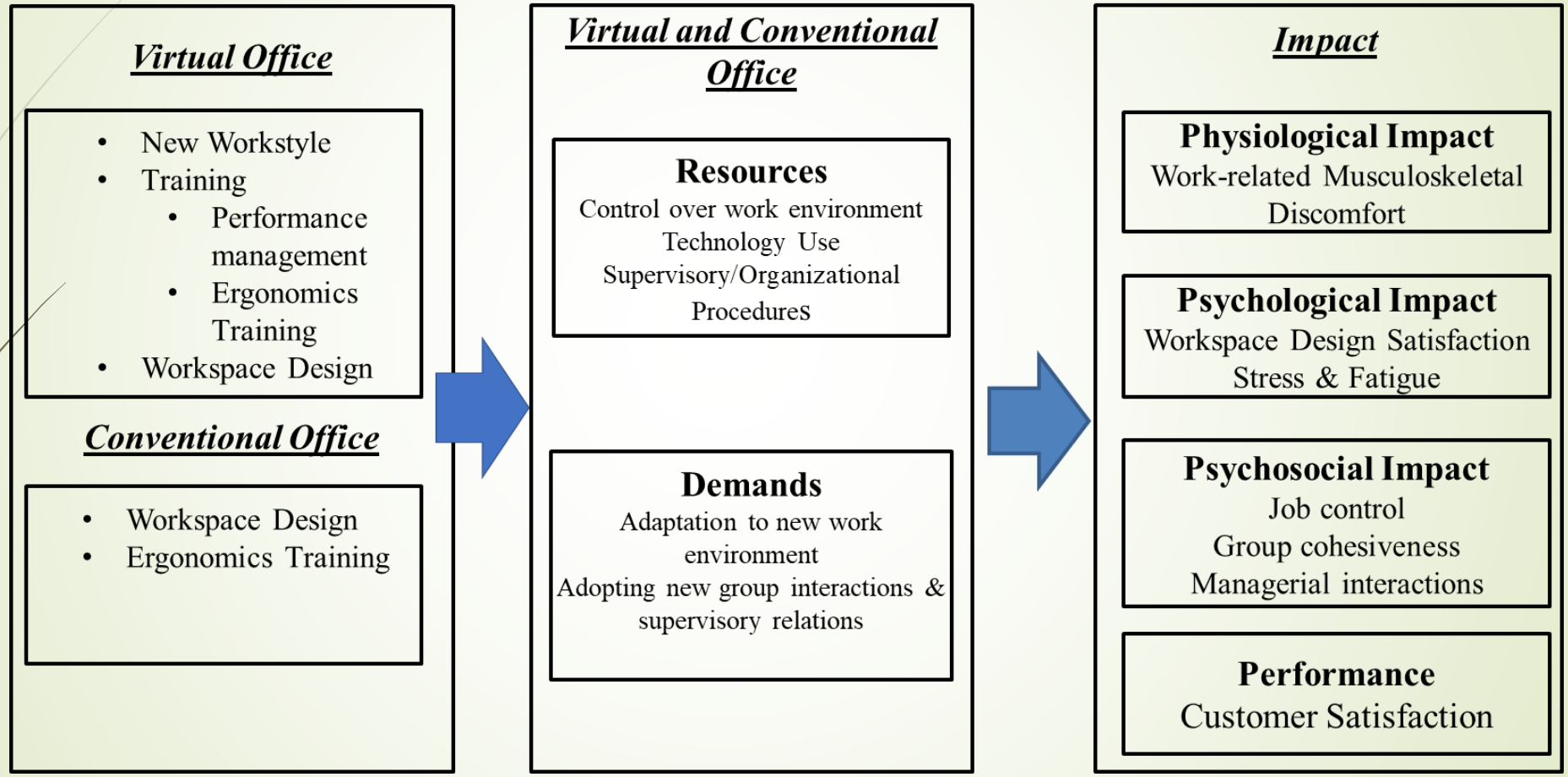
- Few studies have examined the long-term effects of telework and virtual offices compared to a control condition
- Meta-analysis of 23 epidemiological studies (Oakman, et al., 2020)
- Need for interdisciplinary, systematic research aimed at the safety and health of teleworkers

Purpose: Virtual Office (VO) Intervention

- Examine the effects of a Virtual Office(VO) program on office workers':
  - Psychosocial perceptions,
  - Mental and physical well-being,
  - Workplace satisfaction
  - Performance

  Compared to a control group working in a Conventional Office (CO) setting
- Use these study findings to provide HFE guidance to adopt and create new ways of working:
  - Home
  - Hybrid flexible model
  - Abrupt shift in the nature of work systems across the globe due to COVID-19

VO Intervention: Conceptual Model



Research Hypotheses:

Compared to the CO group, VO group will report:

- **Enhanced job control** over psychosocial and physical environment of work and **greater group participation/interaction**
- **A more positive virtual office experience** in terms of the quality of supervision, work-life boundary, and workflow (i.e., less work interruption)
- **Greater workspace satisfaction**
- **Less work-related musculoskeletal discomforts**
- **Less mental and physical stress** and **commuting fatigue**
- **Similar level of customer satisfaction**, performance indicator

Study Design

- Prospective, repeated-measure field intervention study
- Pre and Post intervention survey measures
  - Assess effects of a Virtual Office (VO) pilot intervention
- Focus groups: Post-intervention (managers/employees)
- Two groups:
  - Virtual office workers (n=137)
  - Conventional office workers (n=85)
- Both groups include employees and managers
- Study period over <u>12 months</u>

Virtual Office Program

- VO steering committee
  - Sub-Teams: IT; Training; Communications; Measures; Policies
- Employee and Manager training
  - Communication, performance, setting expectations
  - Safety and ergonomic training (corporate resource)
  - Logistics
  - Planned & discussed VO performance management contract
- Office equipment
  - Laptop, printer, cell phone and file cabinet

Study Measures: Mixed Methods

- **WorkStyle Environment & Health Survey:** pre and post-intervention
- Focus groups
- Business Results (confiendital)

Employee Satisfaction	Customer Satisfaction	Business Results
Survey topics:	**Survey topics:**	**Survey topics:**
• Opinions on Overall Impacts of Virtual Office	• Customer Satisfaction	• Managers' Opinion on Virtual Office
• Perceptions on Virtual Office: Psychosocial		• Workgroup Effectiveness from the Managers' Perspective
• Impact on the Work		• Productivity
• Communications		• Impact on the Work from the Managers' Perspective
• Characteristics of Work Management		**Additional information:**
• Commuting Issues		• Public Transportation Subsidy Program (PTSP) Impact
• Physical Comfort and Stress: WMSDs		• Use of Sick and Annual Leave
• Physical Work Environment (Workspace)		• Pilot Implementation Costs
• Tools and Technology		• Rent and Space Savings
		• Employee Retirement Rate

Summary

- VO: Positive impact on employees' well-being and performance
- VO intervention:
  - Enhanced job control, participation and decision making, and interaction and cohesiveness
  - Improved supervisory quality
  - Increased workspace design satisfaction
  - Fewer WSMD symptoms in upper body only
  - Reduced physical and mental stress, and physical commuting fatigue
    - Interesting: Rest breaks, interruptions, physical commuting fatigue; No difference CO vs. VO. VO reduction in mental fatigue
  - Greater customer satisfaction (self-reported performance)

Strengths and Limitations

- Limitations:
  - Non-randomized
  - Prior expectations of teleworking
  - Subjective ratings
- Strengths:
  - Work Systems approach to design VO intervention
    - Performance management contract; training
  - Field long-term intervention study
  - Prospective, repeated measures, study with control group
  - High participation rate
  - Sr. management and union support

Research to Reality: Learnings---Guidelines

- Use a systems approach to plan, implement and evaluate sustainable VO/telework/hybrid programs –Working From Anywhere

In-Person/Office → Hybrid/flexible → Remote/Virtual Office/WFA

- Importance of senior management commitment & communication
  - Goals and policies of VO program: Flexible Work Arrangement Policy
    - Level of Organizational readiness
    - Support & Resources; Technologies; Equipment; Purchasing; Compensation (shifting of costs)
    - Involve key stakeholders: Management; Union; IT; Measures (KPIs)
    - Evaluate & adapt program for sustainability, continuous learning; External environment impacts
  - Evaluate jobs, Work Based Activity, and align with business strategies:
    - Timing and geographic location (satellite hubs)
    - Sharing Information
    - Degree of collaboration & coworker support
    - Informal learning (on-boarding and career-extending benefits)
    - Public Service relationships & client interactions

Research to Reality: Learnings---Guidelines (cont.)

Design training programs & provide supplemental resources:

- Managerial training on how best to manage VO and hybrid workers:
  - Performance management contract
  - Communication strategies; time, role expectations; method, tasks and career development; job autonomy/control & decision making
  - Create a sense of connection: belonging & engaged
  - Facilitate team and co-worker interactions; team software & meetings
    - Teams/manager/employees determine "A day in the office" or "satellite"
  - Formally develop and support boundaries concerning work/life issues
    - Ability to "disengage": Prevent burnout
- Use of technologies;
  - equipment set-up & technical IT support
- Arranging one's work environment: Ergonomic/safety and health policies
  - Workstation set-up; "House/Office Rules"
  - Ergonomic assessments; surveillance; Resources
- Create network for VO and CO experiences: Culture & Norms

New Way of Working Training: Customize for Corporate Culture

- Tips for comfortable working postures
- Monitor your working habits
  - Take Mental and Physical breaks
- Schedule your virtual meetings for natural breaks and work tasks variation
- Be Aware of your time spent on task
- Create Work Boundaries
  - Separate Workspace
  - Signals of quiet time
- Turn it off; separate home and work life
- Look for new opportunities to try something different during you personal time

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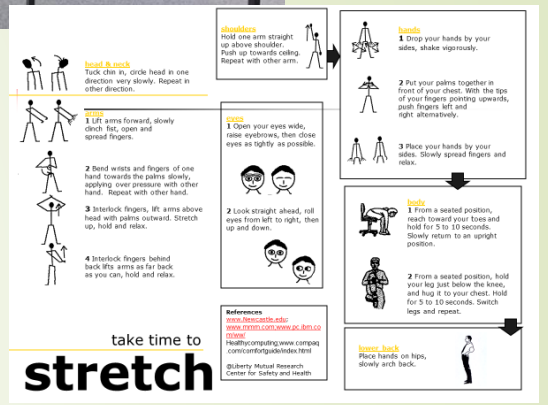

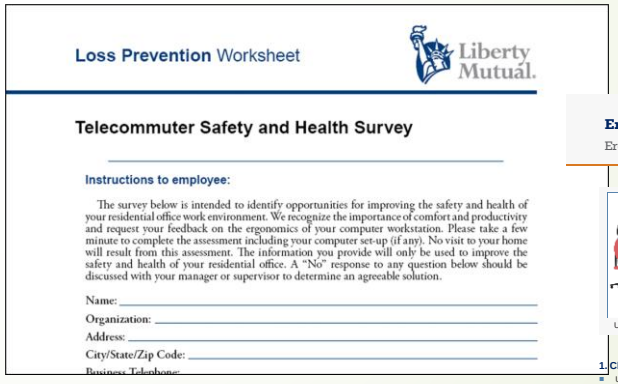

Robertson, M. M., & Maynard, W. (2016). Managing the safety and performance of home based teleworkers: A macroergonomics perspective. In A. Hedge (Ed.), Ergonomics Design for Healthy and Productive Workplaces

Balancing: Creating a Sense of Control

Helpful Resources

- Robertson, M. M., & Maynard, W. (2016). Managing the safety and performance of home based teleworkers: A macroergonomics perspective. In A. Hedge (Ed.), Ergonomics Design for Healthy and Productive Workplaces
- www.hfes.org; info@hfes.org

- Robertson, M.M., & Mosier, K. (2020) Work from Home: Human Factors/Ergonomics Considerations for Teleworking, International Labour Organisation; World Day Safety at Work. https://www.ilo.org/global/topics/safety-and-health-at-work/events-training/events-meetings/world-day-safety-health-at-work/WCMS_742138/lang--en/index.htm

Ipsen, Christine, et al., EXPERIENCES OF WORKING FROM HOME IN TIMES OF COVID-19 International survey conducted the first months of the national lockdowns https://www.researchgate.net/publication/342691416

International Labour Organization

International Ergonomics Association