Occupational health & concepts of ergonomics

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Vision & Mission of RMU

Vision

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals, who are lifelong experiential learner and are socially accountable.

Mission Statement

To impart evidence-based research-oriented health professional education in order to provide best possible patient care and inculcate the values of mutual respect, ethical practice of healthcare and social accountability.





Learning outcomes

At the end of session students should be able to:

- 1. define occupational health
- 2. Comprehend epidemiology of occupational health problems
- 3. Explain concept & significance of ergonomics
- 4. Categorizes occupational hazards

of	Learning Objectives	(1 3
Lecture	Core Subject	(17 slic
	Vertical integration+ horizor	ntal integration
-	Vertical integration+ horizor (5 slide) (2	ntal integration slide)
-	Vertical integration+ horizor (5 slide) (2 Bioethics +artificial intellige	ntal integration slide) ence +research

End of lecture assessment

(1 slide)

Occupational Health



Study of the effect of work and the working environment on the health of the worker and influence of the state of the health of the workers on his ability to perform the work for which he is employed.

the adaptation of work to man and of each man to his job

Problem Statement

(Epidemiology of occupational health problems) Global Workforce (15Y plus)

- **a. In 2022 :** approximately 3.32 billion people employed worldwide.
- **b.** In countries like USA 90% of work sites don't have access to occupational health services

Core Concept

- **c.** In Pakistan, The labor force increased to 71.76 million in 2020-21.
- d. minimal wages or Labor rate in Pakistan 2024. (35000/-PM).
 (<u>https://wageindicator.org/salary/minimum-wage/minimum-wages-news/2024/</u>)

Problem statement

(Epidemiology of occupational health problems)

The ILO estimates

- work-related 6000 deaths every single day.
- The construction industry----high rate of recorded accidents.

https://www.ilo.org/moscow/areas-of-work/occupational-safetyand-health/WCMS_249278/lang--en/index.htm

WHO Estimate:

- Occupational injuries caused 19 per cent of total deaths.
- **19 occupational risk** factors, including exposure to long working hours
- Long working hours linked to approximately 750,000 deaths.

https://www.who.int/news/item/16-09-2021-who-ilo-

Core Concept Core Concept

Occupational Environment

sum of external conditions and influences which prevail at the place of work and have a bearing on the health of working population.

- Interactions
 - 1. Man, and Physical, Chemical & Biological Agents..
 - 2. Man, and Machine. (responsible for 10% occupational injuries)
 - 3. Man and Man (Psychosocial factors)

Physical hazards

Core Concept

- 1. Heat & cold
- 2. Light
- 3. Noise
- 4. Vibration
- 5. Ultraviolet radiation
- 6. Ionizing radiation

Physical hazards

1. Heat and cold

- Heat effects: burns, heat exhaustion, heat cramps
- Cold effects: chilblains, erythrocyanosis, frost bite
- Hot spots????
- Radiant heat---main problem of glass & steel industry
- Heat stagnation---jute & cotton textile industry

Physical hazards(contd.)

2. light:

• Acute effects of poor illumination:

eye strain, headache, lachrymation, congestion around the cornea

Chronic effects of poor illumination:
Miner's nystagmus

3. noise:

- Non auditory effects
- Auditory effects

Vertical integration

Physical hazards(contd.)

Vertical integration

- 4. vibration:
- white fingers



- 5. Ultraviolet radiation:
- Welder's flash
 - Keratitis
 - Conjunctivitis
 - Disappear in few days

Chemical hazards

Core content

Local actions:

Dermatitis, eczema, ulcers

inhalation:

1. Dust

- Respirable dust
- Organic ,inorganic dust
- Soluble, insoluble dust
- 2. Gases, metals & compounds

Ingestion:

Through contamination hands, food, cigarette

Biological Hazards

- **Biological Agents**: bacteria, Viruses, Parasites, fungi, and molds (Lab workers)
- Health care workers: Hepatitis B,C, HIV/AIDS infections and tuberculosis, CCHF, COVID-19
- Agricultural and forestry workers are exposed to parasitic and zoonotic diseases, (Animal handlers)

MECHANICAL HAZARDS

Mechanical Hazards Can be Caused



Psychosocial Hazards

Psychological Hazards in the Workplace



Job Security

Technology

Changes



Hours of Work



Core

Concept

Personal Relationships



Company

Changes





Critical Incidents



1/

Vertical integration

Psychosocial Hazards (contd.)

- Psychological & behavioral changes:
 - Hostility, aggressiveness, anxiety, depression, sickness absenteeism
- Psychosomatic changes:
 - Fatigue, headache, pai in the shoulders, rapid ageing, peptic ulcer



Ergonomics

study and design of the working situation from the standpoint of worker with the objective to provide the satisfactory environment in which the worker can undertake the task without undue physical or mental strain.



Ergonomics (contd.)

In easy words: "Fitting the job to the worker"

Objective:

To achieve the best mutual adjustment of man and his work, for the improvement of human efficiency and well being

Artificial Intelligence in the Future of Work

- Computer vision has been shown to be useful in:
 - monitoring safety compliance
 - tracking workers in a particular area
 - examining safety conditions on a particular job site.
 - improve training and assist in reducing the impact of hazards in the workplace
 - process and analyze human language

Role of family physician in occupational health

Improving	Preventing	Contributing
Improving the recognition of occupational disease	Preventing progressive illness & disability of their own patients	Contributing to the protection of other workers similarly exposed

7 ethical principles for occupational health

Promote	Safe and Healthy Workplace Environment
Uphold	Ethical Standards
Avoid	Discrimination
Maintain	Professional Competence
Protect	Patient Confidentiality
Advise and Report about	the health and health risk of the employer
Address	Conflict
	https://acoem.org/acoem/media/PDF- Library/About_ACOEM/Code-of-Ethics-Condensed-Version.pdf

Research

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7586624/

Abstract

Background

The main objective of the study was to assess the knowledge of Ergonomics Principles and Workplace Practice among the software engineers working in a private firm.

• Methodology:

cross-sectional study conducted among 403 software engineers

• Results:

Among the 403 study participants, 85.6% had musculoskeletal problem in any area of focus. Only 9% had adequate ergonomic knowledge and only fewer among them practice it adequately.

• Conclusion:

The study revealed higher prevalence of musculoskeletal problem, lower prevalence of knowledge about Ergonomic principles and much lower prevalence of appropriate practice of Ergonomic principles. This can be alleviated by a simple primary care like ergonomic education and practising.

END OF LECTURE ASSESSMENT (EOLA)

Chronic exposure to poor illumination can lead to:

- a) Cataracts
- b) Glaucoma
- c) Night blindness
- d) Miner's nystagmus
- e) Color blindness

Thank you

Suggested readings

- Parks Textbook of Preventive and Social Medicine. 23rd ed. Occupational health
- Occupational Safety & Health administration of America
- International Labor Organization (ILO)
- Pakistan Social Security Institutions