

Swami Vivekanand College of Nursing, Udgir
Lesson Plan on Occupational Health

Name of the Teacher	: Mrs. Princy B
Topic	: Occupational hazards and their prevention
Group	: B.Sc. Nursing
Method of Teaching	: Lecture cum discussion
Teaching Aids	: Power point, charts and transparencies.
Date	:
Time	:
Duration of Teaching	: One hour
Venue	: B.Sc. Nursing 2 nd year class room
General Objectives	: After the completion of the topic, the Students will be able to <ol style="list-style-type: none">1. Understand the meaning and importance of occupational hazards2. Explain the types of occupational hazards and their prevention3. Practice preventive measures in regard to prevent occupational hazards

BIBLIOGRAPHY

1. Park K. Park's Textbook of Prevention & social medicine. 20th ed. Jabalpur: Banarsidas Bhanot;2009.p.708-19.
2. Kulkarni AP. Textbook of Community Medicine.3rd ed. Mumbai: Vora medical publications;2006.p.272-89.
3. Suryakantha AH. Community Medicine. 2nd ed. New Delhi: Jaypee brothers medical publishers;2010.p.211-35.
4. Gulani KK. Community Health Nursing. Delhi: Kumar publishing house;2008.p.500-7.
5. Basavantappa BT. Essentials of Community Health Nursing.1st ed. New Delhi: Jaypee brothers medical publishers;2011.p.594-6.

Time (minutes)	Specific objectives	Contents	Activity		A.V. aids	Evaluation
			Teacher	Students		
0.00	Introduces the topic	<p>Introduction to topic</p> <p>The place of work like home and school is an important part of man’s environment. The health and efficiency of workers working in any organization get influenced in large measures by conditions prevailing in their work environment. The prevailing conditions are related to physical, biological, chemical and social agents. Worker is usually exposed to these agents for about 6 – 8 hours daily. It is therefore essential that this environment should be wholesome and free from any kind of harmful agents as far as possible.</p>	Gives self introduction and regarding topic. And clarifies the doubts of Students.	Listen and ask the difficult terms meanings and doubts.	Power point	
0.02	Defines occupational health	<p>Definition:</p> <p>Occupational health is defined as “the branch of community medicine, which deals with study of health promotion and maintenance of highest degree of physical, mental and social well being of Students in all occupations” - Joint ILO/WHO Committee occupational medicine.</p> <p>Occupational health refers to promotion and protection of health of Students; control of diseases by early diagnosis and prompt treatment; control of disablement and rehabilitation of disabled Students</p>	Defines occupational health and clears the doubts regarding occupational health.	Listen and note down the important terms	Power point	Defines occupational health.

<p>0.05</p>	<p>Enumerates occupational hazards</p>	<p>Occupational hazards</p> <p>Occupational hazards refers to the presence of harmful agents at workplace. The causes for occupational hazards are poor work environment, over workload, lack of experience of worker, psychological problems like family stress, depression, lack of job satisfaction and so on...</p> <p>Occupational hazards are classified into five types, they are:</p> <ul style="list-style-type: none"> • Physical hazards • Chemical hazards • Biological hazards • Mechanical hazards • Psychosocial hazards 	<p>Lists the occupational hazards</p>	<p>Listens and participates in discussion</p>	<p>Power point and charts</p>	<p>What are the occupational hazards?</p>
<p>0.13</p>	<p>Explains the physical hazards</p>	<p>Physical hazards</p> <p>There are various physical hazards which affects the Students in working environment. They are:</p> <p>a) Heat:</p> <p>Common physical hazard in most industries is heat. Working in extreme high temperature leads to heat stroke , heat cramps, heat syncope(fainting attack) & heat exhaustion. Extreme high temperature causes fluid loss , electrolyte loss and</p>	<p>Explains various kinds of physical hazards</p> <p>Describes the hazards of heat</p>	<p>Listen and participates in discussion</p> <p>Listens and asks the meaning of difficult words</p>	<p>Power point</p> <p>Power point</p>	<p>What are the physical hazards?</p> <p>What are the hazards of heat?</p>

	<p>fatigue. Immediate effect of excessive heat on skin is burns. Many industries have local “hot spots”- ovens and furnaces, which radiate heat. It is main problem in steel industries. Physical work under such conditions is very stressful and impairs health and efficiency of Students. Temperature required for effective working condition is 20 °C to 27 °C.</p> <p>b) Cold:</p> <p>Many Students may be exposed to low temperature either by working in high attitudes, ice factories, cold storage, cold laboratories etc. These Students may develop chilblains, frostbite, erythrocytosis, immersion foot as a result of cutaneous vasoconstriction.</p> <p>c) Light:</p> <p>The Students may be exposed to risk of poor illumination or excessive brightness. Acute effects of poor illumination are eye strain, headache, eye pain, lachrymation, eye fatigue. Chronic effect of poor illumination is “miner’s nystagmus”(rapid involuntary motion of eye ball). Exposure to excessive brightness or “glare” is associated with discomfort, annoyance and visual fatigue. Intense direct glare may also result in blurring of vision and lead to accidents. There should be sufficient and suitable lighting, natural/artificial wherever persons are working.</p>				
		Explains the hazards of cold	Listens and clear the doubts	Power point	What are the hazards of cold?
		Describes the hazards of excessive and poor light.	Listen and clear the doubts	Power point	What are the hazards of excessive light and poor light?

		<p>d) Noise: Noise refers to “wrong sound, in wrong place at wrong time”. Effects of noise are of two types</p> <ol style="list-style-type: none"> i. Auditory effects: temporary or permanent hearing loss ii. Non auditory effects: nervousness, fatigue, interference with communication by speech, decreased efficiency and annoyance. <p>Psychological effect of continuous exposure to noise is irritation, aggressiveness, depression. Poor communication due to noise will result in lack of co-ordination of work.</p> <p>e) Vibration: Vibration is usually produced in drilling and hammering which affects joints of hands, elbows and shoulders. After some months or years of continuous exposure to vibration leads to “white fingers”(fine blood vessels of fingers may become increasingly sensitive to spasm, fingers look white color).</p> <p>f) Ultraviolet radiation: Occupational exposure to ultraviolet radiation occurs mainly in welding which affects eyes, causing intense conjunctivitis and keratitis. Symptoms are redness of eyes and</p>	<p>Explains the auditory and non auditory effects of noise.</p> <p>Describes the effect of vibration</p> <p>Explains the effects of ultra violet radiation</p>	<p>Listens and clear the doubts</p> <p>Listens and clear the doubts</p> <p>Listens and clears the doubt</p>	<p>Power point</p> <p>Power point</p> <p>Power point</p>	<p>What are the effects of noise?</p> <p>What are the effects of vibration?</p> <p>What are the effects of ultra violet radiation.</p>
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		pain, usually disappear in few days with no permanent affect on deeper structure of eye.				
0.21	Describes the chemical hazards	<p>Chemical hazards:</p> <p>. Chemical agents act in three ways.</p> <p>a)Local action</p> <p>b) inhalation</p> <p>c)ingestion</p> <p>a) Local action: Common local action of chemical is contact dermatitis. Other effects are eczema, ulcer and even cancer by irritant action. Occupational dermatitis caused due to machine oil, rubber, X-rays, caustic alkalies and lime.</p> <p>b) Inhalation:</p> <p>I. Dusts : They are released into atmosphere during crushing, grinding, abrading, loading, and unloading operations. Inhaled dust particles affects respiratory system, and causes pneumoconiosis.</p> <p>Dusts are classified into</p> <ul style="list-style-type: none"> • Inorganic dusts: silica, mica, coal, asbestos dust etc.. • Organic dusts :cotton , jute . • Soluble dusts dissolve slowly, enter systemic circulation and are eventually eliminated by body metabolism 	Explains chemical hazards	Listens and participates in discussion	Power point	What are the chemical hazards?
			Describes the local action of chemicals.	Listens and clears the doubt	Power point	What are the local action of chemicals?
			Describes the effects of inhalation of dusts	Listens and clears the doubts	Power point	What are the effects of inhalation of the dusts?

		<ul style="list-style-type: none"> • Insoluble dusts remain more or less permanently in lungs. <p>They are mainly the cause of pneumoconiosis.</p> <p>II. Gases: Exposure to gases is a common hazard in industries . Gases are classified into :</p> <ul style="list-style-type: none"> • Simple gases: oxygen, hydrogen • Asphyxiating gases: carbon monoxide, cyanide gas, sulphur dioxide, chlorine • Carbon monoxide hazard is frequently reported in coal-gas manufacturing plants and steel industry. <p>III. Metals and their compounds: Large number of metals, and their compounds are used throughout industry. Chief mode of entry of some of them is by inhalation as dust or fumes. Metals which cause toxic effects are lead, arsenic, beryllium, cadmium, zinc, cobalt, manganese, mercury, phosphorus, chromium and others. It effects depend upon duration of exposure and dose or concentration of exposure.</p> <p>c) Ingestion: Chemical substances such as lead, mercury, arsenic, zinc, chromium, cadmium, phosphorus usually are swallowed in minute amounts through contaminated hands, food or cigarettes. Lead poisoning is most common effect caused in</p>	<p>Explains the effects of inhalation of gases.</p> <p>Describes the effects of metals and their compounds</p> <p>Explains the effects of ingestion of chemicals?</p>	<p>Listens and clears the doubts.</p> <p>Listens and clears the doubts.</p> <p>Listens and clears the doubts</p>	<p>Power point</p> <p>Power point</p> <p>Power point</p>	<p>What are the effects of inhalation of gases?</p> <p>What are the effects of metals and compounds?</p> <p>What are the effects of ingestion of chemicals?</p>
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		industries. It is caused through inhalation, ingestion and skin. Toxic effects of lead exposure are abdominal pain, blue lines on gums, joint and muscular pain, loss of appetite, persistent headache, weakness, constipation anaemia.etc.				
0.23	Explains the biological hazards	Biological hazards Students may be exposed to infective and parasitic agents at place of work. Occupational diseases are brucellosis leptospirosis, anthrax, tetanus, fungal infections. Persons working among animal products (eg; hair,wool,hides) and agricultural Students are specially exposed to biological hazards.	Describes biological hazards	Listen and participates in discussion	Power point	What are the biological hazards?
0.25	Enumerate the mechanical hazards	Mechanical hazards: Mechanical hazards refers to injuries caused due to mishandling of machines. About 10% of accidents in industry are said to be due to mechanical causes. Mechanical accidents occurs in most of the people with experience of less than one year. Mechanical accidents and injuries are commonly due to poor mental health, unsatisfied family life , improper handling of machines.	Explains the mechanical hazards	Listens and participates in discussion	Power point	What are the mechanical hazards?
0.30	Explains the psychosocial hazards.	Psychosocial hazards: Psychological hazards arise from Students failure to adopt to an alien psychosocial environment . frustration, lack of job	Explains the psychosocial hazards	Listen and participates in discussion	Power point	What are the psychological hazards?

0.32	Explains ergonomics	<p>satisfaction, insecurity, poor human relationship, emotional tension are some of the psychosocial factors which may undermine both physical and mental health of Students.</p> <p>Health effects can be classified in two main categories:</p> <p>(a)Psychological and behavioral changes:</p> <p>Hostility, aggressiveness, anxiety, depression, tardiness, alcoholism, drug abuse, sickness, absenteeism.</p> <p>(b)Psychosomatic ill health:</p> <p>Fatigue, headache, pain in shoulders, neck and back, peptic ulcer, hypertension, heart disease and rapid aging.</p> <p>Occupational hypertension is result of work overload and psychological problems. Lot of stress affects work performance, attention to safety and family relationship. Absenteeism are mainly due to lack of interest in work, sickness, alcoholism.</p> <p>Ergonomics:</p> <p>Ergonomics is well recognized discipline and constitutes an integral part of any advanced occupational health service.</p> <p>Ergonomics term is derived from Greek ergon, meaning work and nomos, meaning law. It simply means “fitting job to the worker”. Training in ergonomics involves designing of machines, tools, equipments and manufacturing processes, lay out of places of work, methods of work and environment in order to achieve greater efficiency both man and machine. The</p>	Explains about ergonomics	Listen and clear the doubts	Power point	What is ergonomics?
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0.42	Describes the prevention of occupational hazard.	<p>objective of ergonomics is “to achieve best mutual adjustment of man and his work, for improvement of human efficiency and well being”. Applications of ergonomics has made a significant contribution to reducing industrial accidents and to over all health and efficiency of Students.</p> <p>Prevention of occupational hazards: Various measures for prevention off occupational hazards are :</p> <p>Medical measures 1)Pre-placement examination</p> <p>It is done at the time off employment and includes Students medical, family, occupational and social history; a through physical examination and a battery of biological and radiological examination eg: chest x ray, ECG, vision testing, urine and blood examination, special test for endemic disease. A fresh recruit may either be totally rejected or given a job suited to his physical and mental abilities. Purpose of pre placement examination is to place right man in right job so that the worker can perform his duties efficiently without detriment to his health.</p>	Explain about prevention of occupational hazards	Listens and clears the doubts	Power point	What are the preventive measures for occupational hazards?
		<p>2)Periodic examination</p> <p>Many disease of occupational origin require months or even years for their development. This is the reason why periodic</p>	Describes the periodic examination	Listens and participates in discussion	Power point	When periodic examination should be

		<p>medical checkup for Students is very necessary when they handle toxic or poisonous substances. Ordinarily Students are examined once in a year but in certain occupation exposures(eg:- lead, toxic dyes, radium,) monthly examination are indicated. Daily examination may be needed when irritant chemicals like dichromates are handled. Particular care should be given to the Students returning from medical leave to assess nature and degree of any disability and to assess suitability or otherwise of returning to same job.</p> <p>3)Supervision of working environment: Periodic inspection of working environment provides information of primary importance in prevention of occupational disabilities. Physician should pay frequent visits to the factory in order to acquaint himself with the various aspects of working environment such as temperature, lighting, ventilation, humidity, noise, air pollution, and sanitation which have an important bearing on health and welfare of Students. He should be aware of raw materials, processes and products manufactured. He should also study various aspects of occupational physiology such as occurrence of fatigue, night work, shift work, weight carried by Students, and render advice to factory management on all matters connected with health and welfare of Students</p> <p>4)Maintenance and analysis of records</p>	<p>Explains the supervision of the working environment</p>	<p>Listens and participates in discussion</p>	<p>Power point</p> <p>Power</p>	<p>done?</p> <p>What should be supervised in working environment?</p>
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	<p>Proper records are essential for planning, development and efficient operation of occupational health service. Students health record and occupational disability record must be maintained . their review should enable service to watch over health of Students , to assess hazards inherent in certain types of work and to advice or improved preventive measures.</p> <p>5)Health education and counseling</p> <p>Health education should start before Students enters factory. All risks involved in industry in which he is employed and the measures to be taken for persona; protection should be explained to him .Correct use protective device like masks and gloves should also be explained .simple rules of hygiene hand washing, paring nails, bodily cleanliness and cleanliness of clothes, should be impressed on him. He should be frequently reminded about the dangers in industry through media of health education such as charts, posters and hand bills. Purpose of health education is to assist the worker in his process of adjustment to the working, home and community environment. Health education will not solve 100% of occupational hazards.</p> <p>Engineering measures</p> <p>1) Design of building :</p> <p>Measures of prevention of occupational diseases should</p>	<p>Explains the maintenance and analysis of records.</p>	<p>Listens and participates in discussion</p>	<p>point</p>	<p>Why Students health record should be maintained and analyzed?</p>
	<p>Engineering measures</p> <p>1) Design of building :</p> <p>Measures of prevention of occupational diseases should</p>	<p>Explain the engineering measures for</p>	<p>Listens and participates in discussion</p>	<p>Power point</p>	<p>What are the engineering measures for</p>

		<p>commence in blue-print stage. Type of floor, walls, height, ceiling, roof, doors and windows, cubic space are all matters which should receive attention in original plan of building which is put up by industrial architect. Once building is constructed, it would be difficult to introduce alteration without much trouble and expense.</p> <p>2) Good house keeping</p> <p>It covers general cleanliness, ventilation, lighting, washing, food arrangements and general maintenance. The walls, ceiling, and passages should be white washed at least once in a year. The dust which settles down the floor, ledges, beams, machinery and other stationary objects should be promptly removed by vacuum cleaners or by wetting agents. Masks, gloves, aprons and other protective equipment should be kept clean and in a state of good repair. To prevent accidents the right thing should be in the right place.</p> <p>3) General ventilation</p> <p>There should be good general ventilation in factories. It has been recommended that in every room of a factory, ventilating openings shall be provided in the proportion of 5 sq.feet for each worker employed in such room, and the openings shall be such</p>	<p>prevention of occupational hazards.</p> <p>Explain about general ventilation</p>	<p>Listens and participates in discussion</p>	<p>Power point</p>	<p>prevention of occupation hazards?</p> <p>Why general ventilation should be maintained?</p>
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		<p>as to admit a continued supply of fresh air. In rooms where dust is generated there should be an efficient exhaust ventilation system. good general ventilation decreases the airborne hazards to the Students, especially hazards from dust and gases.</p> <p>4) Dust</p> <p>Dust can be controlled at the point of origin by water sprays,e.g.wet drilling of rock. Inclusion of little moisture in the material will make the processes of grinding, sieving, and mixing comparatively dust-free. Wet methods should be tried to combat dust before more elaborate and expensive methods are adopted.</p>				
0.54	Enumerate over all preventive measures for occupational hazards	<p>OVER ALL PREVENTIVE MEASURES FOR OCCUPATIONAL HAZARDS ARE</p> <p>(1) Using personal protective equipment is essential to prevent occupational hazards</p> <p>(2)Installing air conditioning in work area is encouraged to prevent heat stress</p> <p>(3)Ventilating work station site is essential where there is amorphous heat</p> <p>(4)Ear plugs are very essential in noise prone areas</p> <p>(5)Provision for spectacles and shield is essential for welders</p>	Explain over all preventive measures for occupational hazards.	Listens and participates in discussion.	Power point	Lists out the over all preventive measures for occupational hazards.

		<p>to prevent eye damage</p> <p>(6)Using facemask and gasmask is good to prevent respiratory disease</p> <p>(7)Hood for machinery at point of origin of dust should be used</p> <p>(8)Hand washing after every contact of chemical substance prevents hazards</p> <p>(9)Using gloves is safe while handling chemical solvents.</p> <p>(10)Adequate local exhaust ventilation system should be encouraged to remove fume and dust</p> <p>(11)Good housekeeping is effective in prevention lead poisoning</p> <p>(12) Personal hygiene is very important in prevention of occupational cancer</p> <p>(13)Electric equipments must be checked for safety before use</p> <p>(14) Wearing safety sole with non skid soles is necessary to prevent accidents</p> <p>(15) Mechanical aids are used to assist in lifting heavy loads</p> <p>(16)Absenteeism is a useful index in industry to assess health status of Students</p> <p>(17) Over workload will hinder optimum health and efficiency of worker. So work should be given according to</p>				
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		<p>the capacity of the worker.</p> <p>(18) Good mental health results in increased efficiency of Students. So it is very essential for the worker to be mentally and physically fit.</p> <p>(19) Periodic monitoring of health of Students should not exceed 2 years. It should be done once in every year.</p> <p>(20) Pre-placement examination is necessary before joining the job</p> <p>(21) Occupational training is mandatory for newly appointed employee.</p> <p>(22) Health education is very necessary but it will not solve 100% of occupational hazards.</p> <p>(23) Early recognition of cases will help in removing them from further exposure.</p> <p>(24) Affected worker may have to be transferred to a job not exposing him to risk.</p> <p>(25) Physical capabilities of Students is essential to meet the job requirement.</p> <p>(26) Establishment of safety department in organization is very necessary to monitor the working environment.</p>				
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0.56	Summarize the topic	<p>Summary</p> <p>Today we learnt regarding definition of occupational health, various types of occupational hazards i.e. physical, chemical, biological, mechanical and psychosocial hazards, prevention of occupational hazards.</p>	Summarizes the topic			
0.58	Concludes the topic	<p>Conclusion</p> <p>Occupational hazards are most common in every company. It may be large scale, or small scale. Prevention of occupational hazards is in hands of Students or employee who are exposed to such hazards. So education regarding the preventive measure is very important to promote the optimum health of the Students.</p>	Concludes the topic			