

Kermanshah University of Medical Sciences
Medical School
Department of Community & Family Medicine
Lesson Plan

Course Title: Principle of Epidemiology

Audiences: International Med Stu, Basic Sciences

Unit number: 2 theoretical units

Time and Place: : Saturday, 10- 12 AM, School of Medicine, Second semester of academic year 99- 400

Course Director: Dr. Ali Azizi, Community Medicine specialist

Overall goals of the course: Students become familiar with Principle of Epidemiology

Overall goal for each class:

Students become familiar with:

1. Definition, applications, history and concepts of epidemiology
2. Measuring tools and important measurements in epidemiology
3. Death rates
4. Infection rates: incidence
5. Infection rates: prevalence rate
6. Common terms in the epidemiology of infectious diseases
7. Dynamics of disease transmission
8. Principles of cross-sectional and ecological studies
9. Principles of Case Studies - Evidence (Part 1)
10. Principles of Case Studies - Evidence (Part II)
11. Principles of cohort studies
12. Principles of Interventional Studies
13. Random clinical trial
14. Relationship and causality in epidemiology
15. Bias in interpreting causal relations
16. Evaluation of diagnostic tests and screening
17. Epidemics and how to study them

Specific goals for the overall goals of each session

Session 1: Familiarity of students with the definition, applications, history and concepts of epidemiology

Special goals: In the end, students will be able to:

- 1-1 -Provide a comprehensive definition of epidemiology.
- 1-2 -Mention a brief history of epidemiological activities.
- 1-3 -List the fields of epidemiological activity and its application.
- 1-4 -Explain the relationship between epidemiology and clinical medicine.
- 1-5 -Explain the differences between epidemiology and clinical medicine.
- 1-6- Describe the epidemiological approach to health problems.

Session 2: Familiarity of students with measurement tools and important measures in epidemiology

Special goals: In the end, students will be able to:

- 2-1 -List the main tools for measuring various events in epidemiology.
- 2-2 -Describe the types of important ratios.
- 2-3 -Express the types of ratios and their application.
- 2-4 -Express the difference between raw, specific and standardized amounts.
- 2-5 -Explain the concept of Fraction Numerator in epidemiology.
- 2-6 -Explain the concept of fraction denominator in epidemiology.
- 2-7- Explain the types of fraction denominators in epidemiology.3 Explain the tools for measuring mortality

Session 3: Familiarity of students with death rates

Special goals: In the end, students will be able to:

- 3-1 -Calculate the raw death rate.
- 3-2 -Explain the uses and limitations of the raw death rate.
- 3-3 -Calculate the specific rates of death.
- 3-4 -Explain the uses and limitations of specific amounts.
- 3-5 -Calculate and interpret the mortality rate of diseases.
- 3-6 -Calculate and calculate the relative rate (ratio) of mortality.
- 3-7 -Calculate the survival rate and explain its applications.
- 3-8 -Express the value of infection data.
- 3-9 -Explain the method of calculating adapted or standardized death rates.
- 3-10- Explain the applications of adapted or standardized death rates.

Session 4: Familiarity of students with infection rates: incidence rate

Special goals: In the end, students will be able to:

- 4-1 -Define and calculate the incidence.
- 4-2 -Calculate and interpret the types of occurrence.
- 4-3 -Explain the applications of the incidence rate.
- 4-4- Explain the problems of measuring the incidence

Session 5: Familiarity of students with infection rates: prevalence

Special goals: In the end, students will be able to:

- 5-1 -Define and calculate the prevalence.
- 5-2 -Calculate and interpret the types of prevalence.
- 5.3 Explain the applications of prevalence.
- 5-4 -Explain the problems of measuring the prevalence.
- 5-5- Explain the relationship between incidence and prevalence

Session 6: Familiarity of students with common terms in the epidemiology of infectious diseases

Special goals: In the end, students will be able to:

- 6-1 -Describe common words about the reservoir and source of infectious diseases.
- 6-2 -Explain common terms about the ways of transmitting infectious diseases.
- 6-3 -Define common terms about a sensitive host.
- 6-4 -Explain the difference between direct and indirect ways of transmitting infectious diseases.
- 6-5- Explain the difference between the terms commune period, latency period and contagion period.

Session 7: Familiarity of students with the dynamics of disease transmission Special goals: In the end, students will be able to:

- 7-1 -Define common terms about a sensitive host.
- 7-2 -Explain the ways of direct transmission of infectious diseases
- 7-3 -Explain the ways of indirect transmission of infectious diseases.
- 7-4- Explain the terms commune period, incubation period and contagion period

Session 8: Familiarity of students with the principles of cross-sectional and ecological studies

Special goals: In the end, students will be able to:

- 8-1 -Name the types of epidemiological studies
- 8-2 -Explain the characteristics and application of a descriptive study.
- 8.3 Explain the steps of descriptive study.
- 8-4 -Explain the characteristics of cross-sectional study and how to design it.
- 8-5 -Explain the characteristics of correlation study (ecological) and how to design it.
- 8-6 -Explain the advantages and disadvantages of cross-sectional study.
- 8-7- Explain the advantages and disadvantages of correlation study (ecological).

Session 9: Familiarity of students with the principles of case studies - evidence (Part 1)

Special goals: In the end, students will be able to:

- 9-1 -List the characteristics of the case study.
- 9-2 -Explain the necessity of selecting the control group in analytical studies.
- 9-3 -Explain how to design a case-control study.
- 9-4- Draw the design of the case study.

Session 10: Familiarity of students with the principles of case studies - evidence (Part 2)

Special goals: In the end, students will be able to:

- 10-1 -Explain the methods of selecting cases and controls.
- 10-2 -Explain the matching methods of case and control groups.
- 10-3 -Explain the concept of Odds Ratio.
- 10-4 -In a case study, calculate the Odds Ratio and interpret it.
- 10-5 -Recognize and express the strengths and weaknesses of a case study.
- 10-6- Explain the types of common abuses in the case-control study.

Session 11: Familiarity of students with the principles of cohort studies

Special goals: In the end, students will be able to:

- 11-1 -List the characteristics of group study.
- 11-2 -Explain how to design a group study.
- 11-3 -Draw the design of group study.
- 11-4 -Identify and express the strengths and weaknesses of a group study.
- 11-5 -Explain the concept of relative risk and attributed risk.
- 11-6 -Calculate the relative risk in a cohort study and interpret it.
- 11-7- Explain the types of common abuses in the case-control study.

Session 12: Familiarity of students with the principles of interventional studies

Special goals: In the end, students will be able to:

- 12-1 -Explain the difference between interventional studies and other types of analytical studies.
- 12-2 -Explain the concept of intervention in intervention studies.
- 12-3 -Define the types of control group in intervention studies.
- 12-4 -Explain the method of random assignment of individuals to the intervention and

control groups.

12-5- Explain the types of blindness in randomized clinical trials

Session 13: Familiarity of students with randomized clinical trial

Special goals: In the end, students will be able to:

13-1 -Explain the design of a parallel clinical trial study.

13-2 -Explain the design of a cross-clinical trial study

13-3 -Explain the design of a parallel, unplanned crossover clinical trial study

13-4 -Explain the design of factorial clinical trial study

13-5 -Explain the methods of showing the results of randomized clinical trials.

13-6 -Explain the method of interpreting the results of randomized clinical trials.

13-7 -Express the concept of internal and external validity in random clinical trials

13-8- Explain the stages of testing a new drug in medical science

Session 14: Familiarity of students with the relationship and causality in epidemiology

Special goals: In the end, students will be able to:

14-1 -Define communication and causality and name the types of communication.

14-2 -Name the criteria for judging causality.

14-3 -Explain the indirect and direct artificial relationship.

14-4 -Express the causal relationship of one to one and several factors.

14-5- Interpret Hill's criteria to prove the causal role of a relationship.

Session 15: Familiarity of students with bias in interpreting causal relationships

Special goals: In the end, students will be able to:

15-1 -Explain the concept of distortion in relation to causality.

15-2 -Explain the types of bias in relation to causality.

15-3 -Explain the definition of the confounding variable

15-4 -Explain the interaction between variables.

15-5- Explain the methods of dealing with different types of bias

Session 16: Familiarity of students with the evaluation of diagnostic tests and screening

Special goals: In the end, students will be able to:

16-1 -Define screening.

16-2 -Describe the characteristics of an appropriate screening test.

16-3 -Explain the validity of screening tests and describe its components.

16-4 -Explain the reliability of screening tests and describe its components.

16-5 -Explain the relationship between credibility and reliability.

16-6 -Explain the positive and negative news value.

16-7 -Calculate the sensitivity and specificity of screening tests and interpret the results.

16-8 -Calculate the news value in screening tests and interpret the results.

16-9- Explain the relationship between the predictive value of the test and the spread of the disease.

Session 17: Familiarity of students with epidemics and how to study them

Special goals: In the end, students will be able to:

17-1 -Define an epidemic by giving examples.

17-2 -List the objectives of studying an epidemic.

17-3 -Describe different patterns of epidemic.

17-4 -Draw epidemic curves of the common, instantaneous, continuous and progressive source.

17-5- Explain the steps of examining an epidemic of a common source.

References:

Epidemiology / Leon Gordis. — Sixth edition, 2019

Teaching method:

The lecture method, using slides and whiteboard, is in line with the questionnaire. In order to create a student participation in conducting a lecture, a question and answer method used.

Educational tools:

A class with visual-audio features (computer, video projector, whiteboard or smartboard)

Evaluation

Exam	Date		Share of total score (in percent)	Exam Type
Midterm	10 Apr 2021		50%	MCQ and Descriptive
End of Term	According to college		50%	MCQ and Descriptive
One absence is allowed, the second absent is 0.25 and the third absent is 0.5 score (except by providing acceptable evidence) and more than three absences are treated in accordance with the training regulations.				

Class rules and expectations of Students:

Students should **avoid** any disturbance during teaching, such as:

1. Entering the class after the teacher
2. Eating and drinking during class
3. Long talk, laugh and make noise

Use of mobile phones and other audio and video equipment

Name and signature of the teacher:

Name and signature of Head of Department:

Name and signature of the EDO Director of the School of Medicine:

Time and Place: Saturday, 10- 12 AM, School of Medicine, Second Semester of Academic year 99- 400

Session	Date	Subject	Teacher
1	16 Jan 2021	Definition, applications, history and concepts of epidemiology	Dr. Azizi
2	23 Jan 2021	Measuring tools and important measurements in epidemiology	Dr. Azizi
3	30 Jan 2021	Death rates	Dr. Azizi
4	6 Feb 2021	Infection rates: incidence	Dr. Azizi
5	13 Feb 2021	Infection rates: prevalence rate	Dr. Azizi
6	20 Feb 2021	Common terms in the epidemiology of infectious diseases	Dr. Azizi
7	27 Feb 2021	Dynamics of disease transmission	Dr. Azizi
8	6 Mar 2021	Principles of cross-sectional and ecological studies	Dr. Azizi
9	13 Mar 2021	Principles of Case Studies - Evidence (Part 1)	Dr. Azizi
10	3 Apr 2021	Principles of Case Studies - Evidence (Part II)	Dr. Azizi
11	10 Apr 2021	Principles of cohort studies	Dr. Azizi
12	17 Apr 2021	Principles of Interventional Studies	Dr. Azizi
13	24 Apr 2021	Random clinical trial	Dr. Azizi
14	1 May 2021	Relationship and causality in epidemiology	Dr. Azizi
15	8 May 2021	Bias in interpreting causal relations	Dr. Azizi
16	15 May 2021	Evaluation of diagnostic tests and screening	Dr. Azizi
17	22 May 2021	Epidemics and how to study them	Dr. Azizi