

# **DEPARTMENT OF MEDICAL EDUCATION**

## **University of Health Sciences, Lahore**

Khayaban-e-Jamia Punjab, Lahore – 54600, Pakistan



## **Basic Biostatistics & Research Methodology**

The aim of this workshop is to furnish the students with strong fundamentals research methods in health sciences and of application of basic biostatistics in research. The students will have an understanding of importance of research in their daily practice and its implications in adoption of evidence based healthcare for the good of the profession and the public.

### **Intended Learning Outcomes**

Upon completion of the workshops participants will be able to:

1. Compare basic quantitative study designs
2. Identify and describe study designs that are commonly used in medical and health studies, including designed experiments, surveys, cohort studies, and case-control studies
3. Describe basic concepts of qualitative research and methods
4. Explain the difference between observational and experimental studies such as clinical trials
5. Develop an outline of a randomized controlled trial
6. Discriminate between the different types of reviews of research and demonstrate the critical features of systematic reviews and meta-analysis
7. Explain the difference between random and opportunistic sampling for health surveys
8. Identify potential sources of bias and variability associated with a given study design
9. Recognize and explain the concepts of confounding and effect modification and how they affect our ability to determine causes of disease and measure the effectiveness of interventions to improve health

10. Define sensitivity, specificity and predictive values in the context of a screening test for a disease
11. Explain the difference between a sample and a population
12. Estimate sample size
13. Interpret graphical displays and numerical summaries for both quantitative and categorical data that are relevant to medical and health sciences studies
14. Translate medical/health questions into appropriate null and alternative hypotheses
15. Explain and interpret confidence intervals
16. Explain the logic of hypothesis testing and interpret p-values
17. Be able to choose an appropriate statistical test (e.g. z-test, t-test, chi-square test) to compare two samples and describe the assumptions underlying the use of these tests
18. Describe the assumptions underlying simple linear regression and be able to interpret a regression model in the context of health outcomes.
19. Use simple linear regression model to make predictions