

Report on the Online Workshop on Research Methodology and Biostatistics



The Department of Epidemiology at Tamil Nadu Dr. MGR Medical University, Guindy, organized an online workshop on **Research Methodology and Biostatistics** on **July 25, 2025**. This workshop, designed for MBBS Undergraduate Medical students, marked the third session of the annual series conducted from March to September.

The primary aim of this workshop was to enhance students' understanding of research methodology and biostatistics, enabling them to apply these concepts in their academic and professional pursuits. The workshop adhered to a well-structured schedule, commencing with the presentation of a QR code for a pre-test on Research Methodology and Biostatistics. Following this, a series of lectures were delivered, accompanied by interactive sessions to encourage active participation and deepen participants' comprehension. As the lecture series drew to a close, a QR code for a post-test and feedback was shared, enabling attendees to further assess their understanding and provide valuable input.

Workshop Details

- **Organizing Institution:** Department of Epidemiology, The Tamil Nadu Dr. MGR Medical University, Department of Epidemiology
- **Mode:** Online
- **Target Audience:** MBBS Part 1 Students

- **Total Participating Colleges: 5**
- **Ariyalur Medical College and Hospital**
No .of. participants:**141**
- **Thoothukudi Medical College and Hospital**
No of participants:**146**
- **Indira Medical College and Hospital**
No of participants:**142**
- **Karpagam Medical College and Hospital**
No of participants:**138**
- **Namakkal Medical College and Hospital**
No of participants :**97**
- **Total Participants: 644**

Sessions and Key Discussions

The workshop consisted of **five sessions**, covering various aspects of research methodology and biostatistics. The topics included:

- **Research Ideas/Questions & Objectives** – Session by **Dr. K. Yuvaraj**,
Head, Evidence Synthesis Unit, PROPUL Evidence, Chennai.
Explained what **research process is, difference between a research idea and a research question, why research? components of a research question, starting with a research question and formulating research objectives.**
- **Searching and Organizing Literature** – Session by **Dr. Monica Dev**, D S
Project Research Scientist III (Medical) ,ICMR, INDIA. EMS Department of
Emergency Medicine and Trauma, JIPMER, Puducherry.
Demonstrated how to use **PubMed** for **searching relevant literature** effectively.
Key concepts while searching using PubMed (MeSH) and Embase (Emtree) – Live
hands on experience on Pubmed search advanced guide.
- **Research Designs** – Session by **Dr. A. Balaji**, Vice Principal, MEU Coordinator,
Professor & HOD, Community Medicine, Arunai Medical College and Hospital

Provided an overview of different **study designs used in health research**, including:

- **Descriptive studies** (case reports, case series, cross-sectional studies)
- **Analytical studies** (case-control and cohort studies)
- **Experimental studies** (randomized controlled trials)

Explained the **advantages, limitations, and appropriate applications** of each study design. Discussed **bias, confounding, and ethical considerations** in research design.

Basic Biostatistics in Health Research – Session Introduced by **Mr. Richard Kirubakaran**, Director , Center for Biostatistics and Evidence Based Medicine – CBEBM, Vellore.

Fundamental Biostatistical concepts such as:

- **Types of data (qualitative vs. quantitative, continuous vs. categorical)**
- **Measures of central tendency (mean, median, mode)**
- **Measures of dispersion (range, variance, standard deviation)**
- **Probability distributions** used in health research

Explained **hypothesis testing and the hypothesis testing process**, including:

- **Formulating null and alternative hypotheses**
- **Types of errors (Type I and Type II errors)**
- **Steps in hypothesis testing** (selecting appropriate tests, setting significance levels, interpreting p-values)

- **Research Protocols** – Session by Dr. Subha Anirudhan, Professor, Department of Conservative Dentistry and Endodontics, Sri Ramakrishna Dental College and Hospital, Coimbatore.

Explained the **importance of a research protocol** in conducting structured, ethical, and scientifically valid research. Discussed the **essential components of a research protocol**, including:



Ariyalur Medical College and Hospital



Thoothukudi Medical College and Hospital



Indira Medical College and Hospital



Karpagam Faculty of Medical Science and Hospital



Namakkal Medical College and Hospital

INTERACTIVE SESSIONS BY THE EXPERTS

Picking a research PROBLEM

- Your passion or your guide's?
- Your expertise or your guide's?
- Extension of an ongoing project of your guide?
- High risk or low risk?

11:24 | Virtual RMBS Workshop for Under Gradu... 31°C Haze ENG 11:24 AM IN 7/25/2025

Research Ideas /Questions & Objectives - Dr. K. Yuvaraj

The screenshot shows a Google Meet window with a slide titled "Logic Grid". The slide content is as follows:

Logic Grid

In children with fever, does paracetamol reduce fever more effectively than ibuprofen within 2 hours?

P: "children", "pediatric", "infant", "child" [MeSH]
 I: "paracetamol", "acetaminophen" [MeSH]
 C: "ibuprofen" [MeSH]
 O: "fever", "antipyretic effect", "body temperature", "temperature control"

The slide also includes a flowchart with a red arrow pointing from the question to the search terms. The arrow is labeled "AND".

The meeting interface shows the presenter's name as "monica dev ds (Presenting, annotating)". The "People" panel on the right lists 10 contributors, including "MEETING TNMGR...", "ARYALLUR MEDICAL CO...", "community medicine d...", "Janani Venkataraj705", "M.Sc.Public Health DEP...", "MEETING TNMGRMU", and "monica dev ds".

Searching and Organizing Literature-Dr.Monica Dev

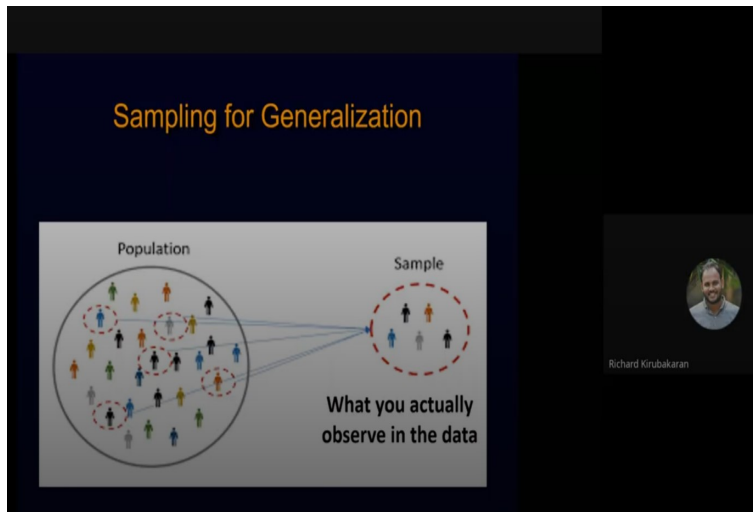
The screenshot shows a Google Meet window with a slide titled "Did investigator assign exposures?". The slide content is as follows:

Did investigator assign exposures?

- Yes
 - Experimental study
 - Random allocation?
 - Yes: Randomised controlled trial
 - No: Non-randomised controlled trial
- No
 - Observational study
 - Comparison group?
 - Yes: Analytical study
 - Direction?
 - Exposure → Outcome: Cohort study
 - Exposure ← Outcome: Case-control study
 - No: Descriptive study
 - Exposure and outcome at the same time: Cross-sectional study

The meeting interface shows the presenter's name as "Balaji Arumugam (Presenting, annotating)". The "People" panel on the right lists several contributors, including "MEETING TNMGRMU", "Balaji Arumugam", "Janani Venkataraj705", "Rishi Kumar...", "Support @...", "MEETING TN...", "ARYALLUR ME...", and "M.Sc.Public H...".

Research Designs – Dr. A. Balaji



Basic Biostatistics in Health Research –Mr.Richard Kirubakaran

WHY BOTHER WITH A PROTOCOL?

- **Clarity & Direction**
 - A protocol acts as your study's blueprint, providing a clear roadmap from inception to completion.
- **Planning & Collaboration**
 - It streamlines planning, aids in securing funding, and facilitates interdisciplinary collaboration.
- **Ethical & Regulatory Compliance**
 - It's a mandatory document for ethics committees and essential for journal submissions.
- **Minimizing Bias**
 - A well-structured protocol reduces potential errors and bias, enhancing research integrity.

Research Protocol – Dr. Subha Anirudhan

COMPARISON SCORES OF PRE-TEST AND POST-TEST

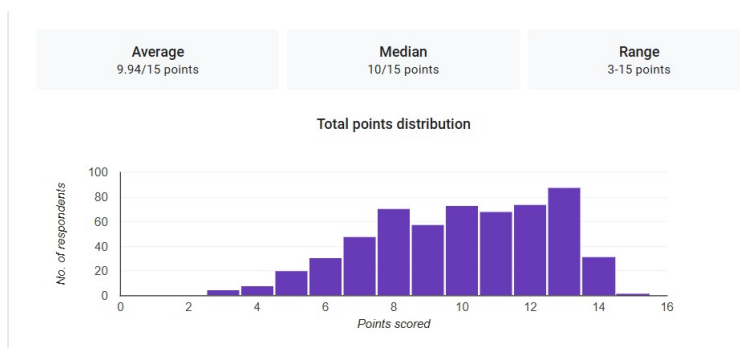


Fig 1. Pre-test score of Participants

Average 10.58/15 points	Median 11/15 points	Range 1-14 points
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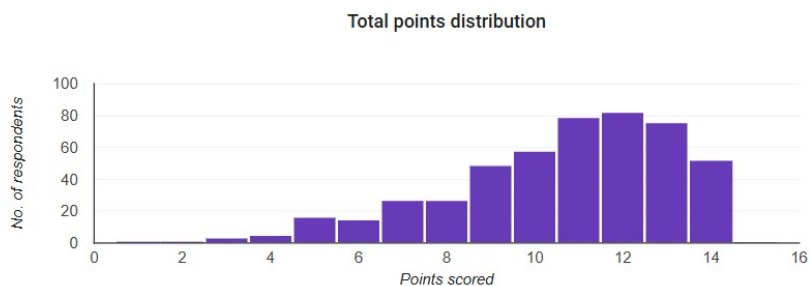


Fig 2. Post test score of Participants

OVERALL FEEDBACK FROM THE STUDENTS:

The day was effectively initiated by Dr. G. Srinivas, Professor and Head, Department of Epidemiology, whose introductory session set an enthusiastic and insightful tone for the rest of the workshop. The sessions provided participants with a solid grounding in research methodology and biostatistics, offering valuable insights that will support their academic research, thesis work, and future careers in medicine. The workshop concluded with closing remarks from Dr. Jasmine S. Sundar, Senior Assistant Professor, Department of Epidemiology, TNMGRMU.

Key Aspects That Impressed Participants

Research Ideas, Questions & Objectives – The session by **Dr. K. Yuvaraj** was highly appreciated, especially for its engaging and interactive activity on formulating research questions.

Searching and Organizing Literature – **Dr. Monica Dev** delivered a practical and informative session on using databases like PubMed.

Research Designs – **Dr. A. Balaji** effectively explained various study designs and their real-world applications, providing much-needed clarity.

Basic Biostatistics in Health Research – **Mr. Richard Kirubakaran** was praised for simplifying complex statistical concepts, making them accessible to undergraduate students.

Research Protocols – The session by **Dr. Subha Anirudhan** offered valuable insights into systematically structuring a research study.