

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 **September 19, 2025**. This workshop, designed for third-year MBBS Part-I Undergraduate Medical students, marked the first 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:** Tamil Nadu Dr. MGR Medical University, Department of Epidemiology
- **Mode:** Online
- **Target Audience:** Third-year MBBS Part- I undergraduate students

- **Total Participating Colleges: 11**
 - Government Cuddalore Medical College - 148
 - Arunai Medical College & Hospital- 152
 - Christian Medical College - 98
 - Government Kilpauk Medical College - 120
 - Theni Government Medical College and Hospital - 100
 - Dhanalakshmi Srinivasan Medical College and Hospital -229
 - Tirunelveli Medical College - 36
 - Government Medical College, Tiruppur- 180
 - Government Pudukkottai Medical College & Hospital- 150
 - Government Medical College Thiruvallur- 65
 - The Government Medical College Karur- 135
- **Total Participants: 1413**

Sessions and Key Discussions

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

1. **Research Ideas/Questions & Objectives** – Session by Dr. Subha Anirundhan, Professor, Department of Conservative Dentistry and Endodontics, Sri Ramakrishna Dental College and Hospital, Cimbatores.
 - Explained the **research process, difference between a research idea and a research question, components of a research question, types of research questions, and formulating research objectives.**
2. **Searching and Organizing Literature** – Session by Dr. S.A. Rizwan, Scientist D, National Institute of Epidemiology (NIE), ICMR, Chennai.

- Demonstrated how to use **PubMed** for **searching relevant literature** effectively.
- Explained the use of **Zotero** for **organizing references and managing citations**.

3. **Research Designs** – Session by Dr. K. Yuvaraj, Head, Evidence Synthesis Unit, PROPUL Evidence, Chennai.

- 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.

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

- Introduced **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)

5. Research Protocol – Session by Dr. A. Balaji, Vice Principal, MEU Coordinator, Professor & HOD, Community Medicine, Arunai Medical College and Hospital

- Explained the **importance of a research protocol** in conducting structured, ethical, and scientifically valid research. Discussed the **essential components of a research protocol**, including:
 - **Title and background**
 - **Objectives and hypothesis**
 - **Methodology**
 - **Data collection methods**
 - **Statistical analysis plan**
 - **Ethical considerations**



Arunai Medical College & Hospital



Government Cuddalore Medical College



Tirunelveli Medical College



Government Medical College, Tiruppur



The Government Medical College Karur

INTERACTIVE SESSIONS BY THE EXPERTS

MAPPING YOUR IDEAS STEP BY STEP

FINALISE

FORMULATE THE RESEARCH PROBLEM & QUESTION

DISCUSS WITH YOUR MENTOR OR PEERS

NARROW DOWN THE TOPIC

REVIEW AVAILABLE LITERATURE

BROAD AREA OF INTEREST

Subha is presenting, annotating

Participants: Community Me..., MEETING, Subha, Tirunelveli Medi..., You, DS Me, 14 others

History and Search Details

Search	Actions	Details	Query	Results	Time
#10	...	>	Search: #4 AND #5 AND #9	83	03:00:02
#9	...	>	Search: #6 OR #7 OR #8	49,086	02:58:48
#8	...	>	Search: "duration of surgery"[Title/Abstract]	7,555	02:58:28
#7	...	>	Search: "Operation time"[Title/Abstract]	24,475	02:58:20
#6	...	>	Search: "Operative Time"[MeSH Terms]	21,781	02:58:02
#5	...	>	Search: "laparoscopic hysterectomy"[Title/Abstract]	2,924	02:57:39
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Rizwan is presenting

Participant: Rizwan

1:38

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    graph TD
      Q1{Did investigator assign exposures?} -- Yes --> E[Experimental study]
      Q1 -- No --> O[Observational study]
      E --> Q2{Random allocation?}
      Q2 -- Yes --> RCT[Randomised controlled trial]
      Q2 -- No --> NRCT[Non-randomised controlled trial]
      O --> Q3{Comparison group?}
      Q3 -- Yes --> AS[Analytical study]
      Q3 -- No --> DS[Descriptive study]
      AS --> Q4{Direction?}
      Q4 --> CO[Cohort study]
      Q4 --> CCS[Case-control study]
      DS --> CS[Cross-sectional study]
      CO --> EO[Exposure -> Outcome]
      CCS --> EO
      CS --> EOOT[Exposure and outcome at the same time]
  
```

Yuvaraj is presenting

GMCH KARUR TN

CM

Yuvaraj

Zevalorianz

You

amch 12 others

2:36

Quantitative data

Discrete Data :

- Values are distinct and separate.
- Values are invariably whole numbers.

Example:

- No. of children in a family
- No. of daily admission to a general hospital
- No. of missing teeth per child in an elementary school.

Richard is presenting, annotating

amch

Zevalorianz

GMCH KARUR TN

Richard

You

CM 12 others

3:13

Methodology – Data Collection

- Tools: Questionnaire, checklist, clinical exam, lab tests.
- Validated tools preferred.
- Pilot testing
- Data collection procedure step-wise.

Balaji is presenting, annotating

GMCH KARUR TN

CM

Balaji

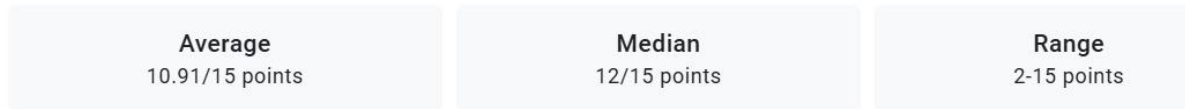
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You

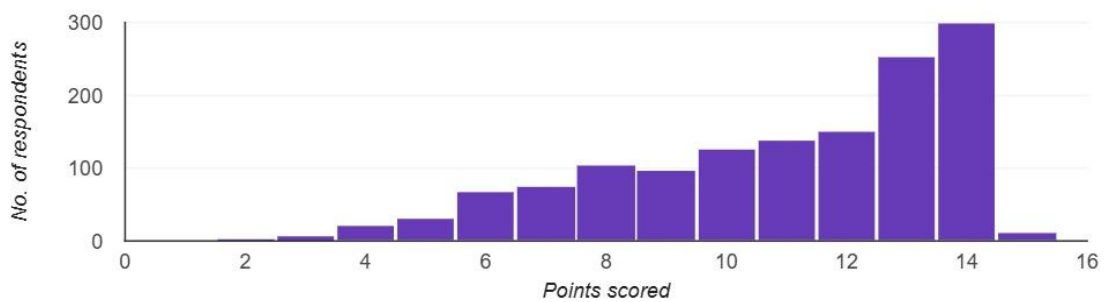
amch 12 others

COMPARISON SCORES OF PRE-TEST AND POST-TEST

Fig 1.Pre-test Score of Participants

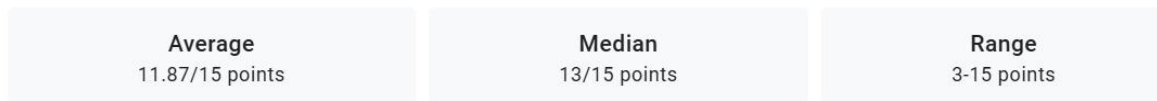


Total points distribution

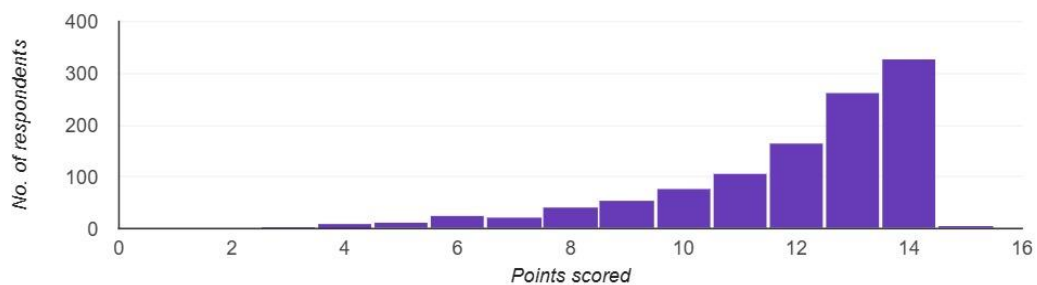


Total No. of Participants- 1413

Fig 2. Post-test Score of Participants



Total points distribution



Total No. of Participants- 1413

OVERALL FEEDBACK FROM THE COLLEGES:

Dr. Jasmine S. Sundar, Senior Assistant Professor, concluded the research methodology workshop. The workshop provided students with a strong foundation in research and biostatistics, which will be valuable in academic research, thesis work, and future medical studies.

Key Aspects That Impressed Participants

- The sessions on **Research Methodology** were especially valued because of their structured format, which helped clarify the fundamentals.
- The overall quality of the sessions stood out—many felt they were well-planned and covered essential topics in **Research and Biostatistics** in depth.
- Practical guidance on how to generate strong **Research Ideas** and craft precise research questions were seen as especially helpful.
- Seeing examples of **Research Methodologies** from different institutions broadened participants' perspectives.
- The faculty's **Style of Explanation**—clear, patient, and thorough—was frequently praised.
- The **Interactive format** of the sessions helped people grasp concepts better—discussion and engagement made a difference.
- **Diversity among faculty** (from varied fields, with ample experience) added value to the learning experience.
- **Hands-on exercises** and group discussions (for example, formulating research questions) made learning more effective and relevant.
- Learning about how to write **Research protocols and Methodology** gave clarity on how to structure a study properly.

Most Appreciated Sessions

Several sessions stood out as particularly impactful for the participants:

- **Research Ideas, Questions & Objectives** – The session by **Dr. T.S. Subha Anirudhan** was highly rated, especially for its interactive Session on research question formulation.
- **Searching and Organizing Literature** – The session by **Dr. S.A. Rizwan** on PubMed and Zotero was considered practical and informative.
- **Research Designs** – The session by **Dr. K. Yuvaraj** provided clarity on different study designs and their applications.
- **Basic Biostatistics in Health Research** – The session by **Mr. Richard Kirubakaran** was praised for making statistical concepts easier to understand.
- **Research Protocols** – The session **Dr. A. Balaji** by provided useful insights into structuring a research study effectively.